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THE PASSION FOR LEARNING AND KNOWING

Proceedings of the 6th International Conference on Organizational Learning and Knowledge

Edited by:
Silvia Gherardi
Davide Nicolini

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a b s t r a c tion
Exploring micro-practices of organisational learning in a department of anaesthesiology

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Keywords: abstraction, organisational learning, mindfulness, high reliability

Abstract:

'Abstraction' as micro-learning-process is rarely used to analyse practices of organisational learning. In this paper, we portray abstraction as a basic learning process that prevails even in contexts characterised by high degrees of uncertainty and heterogeneity, that is, in high reliability organisations (e.g. La Porte, 1996; Rochlin, 1996; Roberts, 1990; Weick, 1987). We discuss several flavours of abstraction and use them as heuristic devices to analyse how organisational agents apply abstractions to cope with new and unexpected situations. For this purpose, we present an empirical case dealing with work experiences of novice nurse anaesthetists. Based on this case, we argue that the *way* abstraction is built and applied has a major influence on whether novel situations can be handled 'mindfully' (Weick & al., 1999).

"Simply manage to act rather than re-act. In other words, I have to be one step ahead. I have to use my own mind; I need to imagine what I could be facing."

Experienced nurse anaesthetist

Introduction

'abstraction essential is.'

What you can see here has potential. One might use the once acquired basic structure of the English language (subject – verb – adjective/object) to put the words into the order 'abstraction is essential.'. Others would add a question mark and get 'is abstraction essential?'. By playing with the potential of those three words and the punctuation (or with those 22 letters and the punctuation), one can create a sheer endless combination of different meanings (or no apparent meaning at all). One might mix the letters in other combinations: just think of anagrams like 'abtsrat cioneses ntialsi', 'satan trials obscenities', 'trentos asiatic lesbians' and so on.

The statement 'abstraction is essential.' is itself highly abstract because no context has been given – yet.

Abstractly speaking, the aim of our paper is to explore the notion of 'abstraction' with regard to its relevance for learning in organisations. We will argue that abstraction or rather 'abstracting' is a basic and necessary learning process which should not be confused with abstract information as e.g. provided by certain company mission statements or written standard operating procedures somewhere hidden in a database. The 'constitution of practice',

in our view, is inextricably bound to abstract*ing* and to applying abstractions to concrete situations. This double movement is akin to what Giddens (1990) referred to, on a macro-level, as processes of 'disembedding' and 'reembedding'. Such processes of disembedding, reembedding and abstraction do not feature prominently in the literature on organisational learning, however. Abstraction is rarely used to analyse social behaviour (Call, 2003). In research on organisational learning, there might be at least two reasons for this. First, there is a general lack of studies focusing on micro-processes of learning, as Easterby-Smith and Araujo (1999) confirm: "In our view there is a particular shortage of studies that attempt to induce theory from existing practice, use a small sample of in-depth cases, focus on micro-practices within organizational or trans-organizational settings and study processes leading to learning outcomes." Second, an important stream of the literature is highly sceptical of the idea that abstract(ed), context-independent knowledge has a relevance for actual practice at all.[2] These practice-based studies, which are in good currency in research on organisational learning (e.g. Brown & Duguid, 1991; Lave & Wenger, 1991; Gherardi, 1999) share an emphasis on the situated nature of learning processes. These seem to be equated with concrete experiences and activity disregarding any form of concept-building that might follow. Noticing this puzzle, Gherardi (1999, p.116) states: "Learning in practice and learning a practice are always situated forms of learning at a pre-reflexive level, but reflexivity is a characteristic of all order-producing social activities." Thus, practice-based learning theories stress the importance of experiencing concrete situations of or in work practices. It is argued that workplace learning has to be conceptualised as situated in the specific social and organisational context in which it occurs (e.g. Lave, 1988; Lave & Wenger, 1991; Brown & Duguid, 1991; Tyre & Hippel, 1997). Earlier cognitivist approaches to organisational learning as well as contemporary simplistic approaches to 'knowledge management' are criticised by authors writing from a practice-based perspective as being based on an 'ontology of possession' (Cook & Brown, 1999) and as 'reification of knowledge' (Gherardi, 2000). Practice-based studies regard knowledge as socially constructed and unstable, rather than invariant and objective, as much of the mainstream knowledge management literature does (for a critical view to the concept of knowledge management see also Alvesson and Kärreman, 2001). While we do agree with this critique of simplistic images of knowledge, materialised e.g. in attempts to render knowledge explicit and thus accessible for distribution by databases etc., we do not share the wide-ranging neglect or disdain of processes of abstraction. In our view, the value of abstraction is often deemed small for the wrong reasons. The process of abstraction is confused with the problematic notion of objectified (e.g. written down), disembedded knowledge thus regarded as being in conflict with the logic of practice which relies on the contextualised social construction of (often tacit) knowledge[3]. Contrary to this view, we argue that abstraction in terms of day-to-day processes of theory-building and sense-making may serve as a relevant heuristic device for analysing learning processes in organisations. E.g. in order to participate in and to reproduce a practice, knowledgeable agents (Cohen, 1989) need to perceive the underlying pattern of a practice so they can act according

to this pattern (Becker & Brauner, 2003). Furthermore, even in cases where processes of abstraction account for some sort of learning myopia, it is still (or maybe all the more so) relevant to explore the way abstraction takes place, what kind of effects it exerts and how it is dealt with.

There is at least an analytical distinction to be made between abstraction as a research method and abstraction as a research object. By asking how abstraction is applied in day-to-day organisational learning[4] we focus on the latter.

We consider abstraction in organisational learning from a social-constructivist view put forward by Piaget and von Glasersfeld, among others, and from a semiotic perspective put forward by Ch. S. Peirce. Within this perspective, we will distinguish between several aspects of abstraction, namely, reductive and creative aspects, abstraction as process or result, and abstraction viewed as potential or restriction. We will illustrate these different facets by presenting and discussing empirical material drawn from a study at a department of anaesthesiology. The example of a high reliability organisation may serve as a case in point to show that abstraction is a basic feature of learning processes, even in a context characterised by high degrees of heterogeneity, uncertainty and thus novel situations. Weick and Sutcliffe (2001) argue that in such organisations mindful behaviour is of major relevance. Since abstraction can both foster and impede mindfulness, we will also include 'cacophonies' in our analysis, discussing possible shortfalls of abstraction. Looking at the *way* abstractions are built and applied, rather than solely looking at abstraction as an outcome, reveals a variety of processes of abstraction, situated in practices.

The structure of the paper is as follows. In the first part of the paper we will present several definitions and connotations of abstraction with a particular focus on constructivist and linguistic views. In the second part, we will briefly review the notion of mindfulness and discuss its interrelation with abstraction. We will illustrate our arguments by presenting and analysing interview material and observation data concerning the introductory period of novice nurse anaesthetists, based on an ethnographic study at the University Hospital of Innsbruck, Austria.

II. Flavours of Abstraction

So who's afraid
of a little abstraction?
Rush – roll the bones

When you look at a map you are looking at an abstraction of an object's surface which is located in a three dimensional space. Cartographers have developed several different techniques to represent the surface of earth on a two-dimensional plane; thereby cartographers do the same as distillers[5]. They abstract certain features deemed relevant for the sake of essence. Both kinds of 'abstraction' can be useful, just think of Luis Borges' story of the value of abstraction due to the absurdness of a 1:1 map (Borges, 1960/2000).

There has been a long philosophical and linguistic discussion on the ontological status of abstract objects, most prominently represented by Aristotle's 'Metaphysics' and George Berkeley's 'Treatise Concerning the Principles of Human Knowledge' (Frege, 1918; Hale, 1987; Zalta, 1983). We will comment on these issues only insofar as we adopt a constructivist (and late-Wittgenstein-inspired) position, suggesting that the meaning of a term/concept is constituted by its use (Wittgenstein, 1977). In this paper, we will restrict our analysis to the definition of abstraction as the process of formulating general concepts by recognising shared properties among a number of individuals. 'Abstraction' as a result of this process of abstraction then, is conceived here as a general concept (name or relation[6]) arrived at by extracting common features from specific examples (e.g. Locke, 1690). This allows one among other things to apply a name to an object while disregarding its actual spatiotemporal position or to ‚recognise' a causal relation in a specific event, irrespective of multiple other features of this very event.

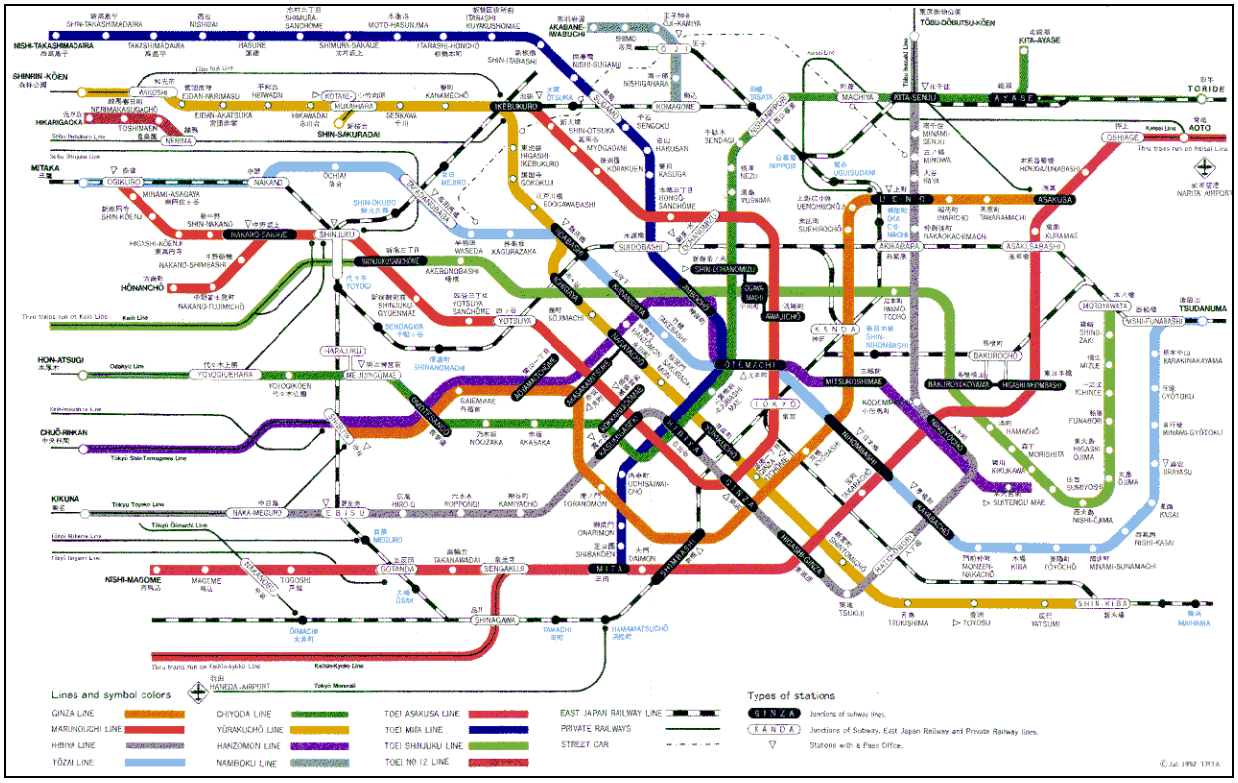

Figure 1. *'unrealistically useful': Tokyo underground*

Borges' example shows several facets or (as we will label them) 'flavours' of abstraction. First, there is the element of reduction and simplification: a lot of features of the surface are left out or 'abstracted from' in a map. This is probably the characteristic of abstraction most referred to. Second, through this process of extraction or distillation a new element is created and named, a 'map' which didn't exist before. A map exhibits qualities other than the phenomenon it was abstracted from. Figure 1, a map of Tokyo's underground system, may

illustrate this characteristic very clearly: the map suggests that stations are almost equally distant to each other - a 'lie', but what a useful one! The divergence between the resulting abstraction and the phenomenon it was abstracted from leads us to the differentiation between 'abstracting' (process/practice) and the resulting 'abstraction' (thing/idea). The process of creating a map (including measuring distances, observing the star constellation, making notes, calculating scales and drawing the map, …) and the map as an objectified result itself differ.

Furthermore, one can look at an abstraction in terms of its potential when applied to concrete (new) circumstances. A map can be restrictive in the sense of restricting one's range of sight or seducing one to accept what is represented. On the other hand, as Borges claimed, a map holds a great potential of orientation and guidance. In the following, we will analyse these flavours of abstraction in more detail, starting with the pair of distillation and creation.

Distillation & Creation

Following Piaget one could argue that abstraction is the art (not the technique) of ignoring/overlooking difference by distilling certain features which can be recognised in several objects or events or in the 'same' object or person at different points of time. His famous term 'object permanence' stands for a child's ability to understand that objects still exist even if they are no longer in sight (Piaget, 1950). Possessing this ability enables children to look for hidden objects and to recognise an object as identical with the one being searched for, it is a precondition for the symbol function and language acquisition.

As opposed to the construction of 'individual identity' – the construction of an object's or person's identity - one can also look for similarities between different objects/persons/event and construct what von Glasersfeld (1987) calls 'equivalence identity'. Comparing objects or events on a certain dimension (like height, time, uncertainty, …), implies the abstraction from other perceived features. Imagine the following scenario: A police car chases another car, having activated the siren on its roof. There are several features that could be imagined as typical for this scenario. Focusing on the siren, that could be e.g. the optic signal of the flashing blue light on the roof, or the increase and decrease of the siren's volume/pitch. Based on these perceptions, we could construct that the optic and the acoustic features of a siren have something in common. Thus, we could abstract the characteristic feature of 'rhythm', of recurrence of similar stimuli, from their optic or acoustic instances in a specific situation. This enables one to represent such a scenario differently within or depending on the medium (e.g. movie/comic). In a comic, the idea of 'rhythm' has to be represented in a static way, e.g. by multiple similar objects in a row (Figure 2).

Figure 2. *Comic and film*[7] *scene from* Frank Miller's Sin City*, 2005: the idea of the rhythm of a siren, represented differently.*

Having abstracted certain dimensions and giving them names like 'rhythm' or 'sweetness', constitutes the construction of a new object according to Charles Sanders Peirce (1902). Peirce illustrates this creative aspect of abstraction when he argues that the construction of an abstract dimension enables new meaning to emerge. Peirce demonstrates this with the example of the term 'sweetness': "It facilitates such thoughts as that the sweetness of honey is particularly cloying; that the sweetness of honey is something like the sweetness of a honeymoon." (Peirce, 1902, p.235).

Peirce (1902, p. 364, quoted in Zeman, 1982) distinguishes explicitly between 'distillation' – in the sense of abstracting from certain features deemed irrelevant - and 'creation' – in the sense of abstracting a new object/concept – by naming the first 'prescission' and the second 'hypostatic abstraction':

> "A decrease in supposed information may have the effect of diminishing the depth of a term without increasing its information. This is often called abstraction; but it is far better to call it prescission; for the word abstraction is wanted as the designation of an even far more important procedure, whereby a transitive element of thought is made substantive, as in the grammatical change of an adjective into an abstract noun."

Closely related to naming are the processes of classification and generalization, as John Locke (1690, quoted in von Glasersfeld, 1995, p.91) put it:

> "This is called Abstraction, whereby ideas taken from particular beings become general representations of all the same kind; and their names general names, applicable to whatever exists conformable to such abstract ideas."

According to Piaget (1959), through the processes of assimilation and accommodation cognitive 'schemata' are developed; they mediate our perception of the world. Schemata are conceived as physical or mental actions or processes that are used repeatedly to attain goals or solve problems, e.g. the grasping of infants or the isolation of variables in economics. In the course of a child's development, he/she moves from a few broad, very generally applied concepts to multiple more differentiated, in a sense more concrete, ones.[8] Again, this kind of generalisation comprises elements of reduction as well as creation. Certain aspects or perceived relations are drawn from specific concrete instances and then generalised to new instances by similarity (e.g. Colunga & Smith, 2003). The generalised aspects or relations then, are often treated as new objects on their own, think of notions like 'gravity, 'abstract expressionism' or 'walkman'. In this respect, Thornton (2003) states that the reductive aspects of abstraction are especially related to the elimination of all factors relating to time and place. He views the constructive aspect of the process as a necessary by-product, since an abstraction is always an abstraction of something, thus an identification of a phenomenon. For a succinct view of the concepts presented see table 1.

a b s t rac t i o n	
Distillation	Creation
Prescission	Hypostatic Abstraction
Abstraction from (abstracting from)	Abstraction of (abstracting)

Table 1. *Flavours of abstraction – Distilling & Creating*

Cognitive psychologists assert that different groups of people tend to prefer different levels of abstraction. Experts prefer 'lower-level' categories (finer grained, narrower categories) as compared to novices who prefer 'higher-level' categories (broader, more 'abstract' categories) (Tanaka & Taylor, 1991; Love, B., 2000; Barsalou, 2003; Hampton, 2003). This is congruent with Piaget's theory of schemata-development.

High level category	Novice	'woof-woof' (broadly applied by children to all kinds of moving creatures)
Low level category	Expert	the term 'Lassie' (narrowly applied to one kind of dog, or to an individual dog)

Table 2. *Levels of abstraction*[9]

As Zimmer (2003) argues, this leads to a gestalt-inspired theory of perception in which the abstract is perceived first and the particular derived later. This seems to oppose our conception of abstraction as extracting common features from specific examples. The gestalt-theoretical argument, though, does not concern the direction of a single abstraction process (it is not suggested that we abstract the concrete from the abstract). Rather, it is asserted that as a novice in a certain area, we first tend to construct and apply fairly general concepts which are then – in the course of participating in a practice – refined and narrowed (Table 2). As an illustration of this idea, consider the following statements taken from our field study material. The first statement stems from an experienced nurse anaesthetist, the second one from a novice:[10]

> Quotation 1: "But when I know someone is new [in the department], then I don't bother him with too much conditional knowledge like specific preferences of different Chief Anaesthetists, because you can't absorb everything at once. The differentiation of knowledge has to increase day by day."
>
> **Experienced nurse anaesthetist, twelve years of work experience**

> Quotation 2: "So far, for me there are 'big surgeries', 'medium surgeries' and 'small surgeries'. For me, they are grouped in this way. With the first group, I need [to prepare] everything, with the third [group] just a 'venflon' [a sort of syringe] and with the second I might need some technical additional devices. These are my sub-categories, and what I need to do. And this is all I am capable of doing so far. Certainly, there will be much more to be learned later on."
>
> **Novice nurse anaesthetist, second month**

The emergence of new objects by abstraction has also been discussed in mathematics. Ferrari (2003, p.1227) gives the example of the 'ratio' (as an 'invention' by Euclid) or 'numbers':

> "From the cognitive perspective, numbers have been regarded as abstracted from the process of counting. For young children, numbers are the actual process of counting all elements of a set of objects actually available, and this process becomes an object only later. […] The definition of new objects is a basic feature of abstraction."

Having already alluded to the significance of abstraction to language creation and use, we will refer to this relation now more explicitly, since we view the use of language – being a social practice – as a major vehicle for learning within organisations[11]. Von Glasersfeld (1987) argues that language (artificial signs) developed from natural signs: Natural signs come into being if we interpret an event that has repeatedly co-occurred with another event as a sign for the latter (e.g. smoke is a sign for fire). This kind of recognition of one event as signalling another one can only be done, if we abstract specific attributes from a certain situation. Otherwise every situation would be experienced as completely unique. Artificial

signs, then, are arbitrarily (de Saussure, 1916) constructed events which are purposefully correlated with relevant events. Again, one would not be able to name something, say an apple, without recognising that the red round thing on the table possesses some common characteristics with the yellow wormy one lying in the grass or the one in the Garden of Eden. In short, one has to distil characteristic features of an event/object/phenomenon in order to understand and use any form of language. Von Glaserfeld (1978, p.62) also stresses the constructive aspect of language in denoting it as a 'combinatory system of signs':

> "It is not crucial that language convey rules of how to combine signs (syntax), but that through this combination further meaning is created: this is inherent to the nature of language as a communication system and the so given creative freedom to the user."[12]

Metaphors (e.g. Niedermair, 2001) offer a million litres of water in an ocean of adopted meaning, just think of 'skyscraper', 'money laundering', 'fishing for compliments' or 'friendly fire'. Abstraction necessarily underlies such creation of meaning, enabling the broadening of one's application and interpretation of terms, irrespective of certain situation-specific instances.

Process & Result

The pumpkin is breathing hard:
Huffa puffa Huffa puffa …..what a pumpkin
Mothers of Invention - Soft-Sell Conclusion

As mentioned above, the process of abstracting, of constructing a general concept, and the result of this process, the abstraction, differ. In teaching and education, abstraction (as result) usually plays a major role. Generally applicable 'theories' or skills are deemed most relevant to be taught. However, the acquisition of abstraction can proceed in divergent ways. One can adopt an abstract concept without 'abstracting', e.g. by learning the formula '$a^2 + b^2 = c^2$' or the rule '$a + b = b + a$' by heart. One can also adopt abstractions by abstracting, that is, by experiencing or imagining concrete instantiations of an abstraction. This could occur either prior to the adoption of the concept or afterwards by 'reconstructing' the abstraction. By retracing the history of an abstraction one gets to know objects or ideas better. This archaeological process sometimes helps the individual to get a broader meaning/understanding of certain routines or behaviour. Or as Ferrari (2003, p.1229) states concerning different pedagogical approaches in teaching mathematics:

> "Proposals of teaching 'abstract' (meaning 'decontextualised') mathematical concepts directly, in the frame of the so-called 'new maths', in the 1960s and 1970s, proved an utter failure. According to such proposals, pupils were taught elements of set theory, or algebraic structures, or even topology, under the expectation that they could learn the basic concepts more quickly and then apply what was learnt to any context. This, of course, hardly happened for pupils other than bright ones. [...]. In the past decades,

research has focused on the role that meanings, goals and contexts have in mathematics learning, and has taken into account other factors that influence learning."

This quotation illustrates that an awareness of the process of abstraction might be useful for the sensible use of abstract concepts. Immediacy constitutes a certain quality; in other words, there is a different quality in the experience of hot coffee by being told that it possesses heat (method 1) and/or burning ones tongue (method 2). Certainly, 'method 2' may not always be convenient (see also March, Sproull & Tamuz, 1991), but strictly speaking, no abstraction as a process happens if someone adopts an abstract concept without the experience (or at least the mental image) of concrete instances. In this vein, Peirce (1931/1956, 4.463) claims that all hypostatic abstraction must be interpreted in terms of what it would or might (not actually will) come to in the concrete (Zeman, 1982).

'Why did you call him Tortoise, if he wasn't one?' Alice asked.
'We called him Tortoise because he taught us,' said the Mock Turtle angrily:
'really you are very dull!'

Thus, the process of abstracting can take several forms: one could build a 'theory' or a 'name' from observing/experiencing/constructing/dreaming/… regularities by oneself, one could reconstruct such regularities, or one could also imagine them, in a sense '*pre*construct' them. Merely adopting built abstractions (e.g. 'new math', 'tortoise', 'democracy', 'love', …) without any form of reference to particular cases does not, in our view, involve any process of abstraction (from/of). Related to learning, we regard this differentiation as being of major relevance.

Restriction & Potential

"I say, never trust anyone"
Garbage, The trick is to keep breathing

Furthermore, one can also look at abstraction with regard to its potential. By discarding irrelevant variation along other dimensions, abstraction holds the potential to provide for the rapid and easy processing of information. In addition, by creatively 'playing' with abstraction, new understanding and meaning can be created (as illustrated above by the use of metaphors). The downside of this can be that we fail to notice or record details of a specific situation, which may prove to be relevant should the task or situation change (e.g. Hampton, 2003).

If one can use a formerly built abstraction to recognise an event as a sign for another, one might be able to react more quickly, e.g. by trying to prevent the signalled (undesirable) event from actually taking place. This very ability is of high relevance in so-called high reliability organisations, as we will discuss in the next section. For another example of this kind of potential of abstraction, consider the convenience of certain everyday theories, e.g. when interacting with strangers or how laborious 'simple' interactions may be in a foreign culture, when we can no longer rely on certain taken-for-granted expectations. A further illustrative

example originally put forward by Polanyi (1962, p.101) and given by Tsoukas and Vladimirou (2001) describes a medical student puzzled by his first confrontation with an X-ray picture. After some time, the student refines his ability to read the picture through his exposure to the relevant material and the specialised language he is taught to apply. They state: "In other words, knowing how to act within a domain of action is learning to make competent use of the categories and the distinctions constituting that domain." (ibid., p.978).

But potential of abstraction lies not only in the performance of such kind of routine behaviour abstraction holds potential. In dealing with new/unknown problems or situations one can experiment with perceived similarities and thus find out whether regularities abstracted elsewhere can be applied to the new situation, whether they have to be modified or whether they are not applicable to the specific situation at all.

'Potentiality' can also refer to the possibility of an abstraction being instantiated in multiple concrete ways that are not a priori determinable. In this sense, Peirce uses the notions of 'hypostatic abstraction' and 'substantive possibility' equivalently. In doing so, he points explicitly to the relation between abstraction, denoted as (abstract) qualities or relations, and potential:

"[…] qualities and relations are possibilities of a peculiar kind. In a secondary sense a quality may be said to exist when it has, as it were, a replica in an existing thing. But strictly speaking a quality does not exist. For to exist is to be a subject of blind compulsion. […] The being of a quality consists in the fact that a thing might be such or such like." (Peirce, 1931/1956, 6.485)

'Potential' in a Peircean notion is 'potentia esse', the potency to existence. Potentiality does not exist per se, it merely states the direction different crossroads inherit. The idea of a spoon, for example, might be related to the idea of a pot or a catapult (illustrated by Figure 3). Still it is the Observer/User/Subject who constitutes meaning. This may also be illustrated by the fact that generality or the level of abstraction cannot be objectively assigned to an expression (e.g. Ferrari, 2003, p.1228), since some expressions may look general in principle, but can be used in a very specific way. Or the other way around as Piaget's example shows, an expression may look specific (woof-woof), but can be used in a very general way (applied to all moving creatures).

Figure 3. *potential of abstraction exemplified: pot & catapult*[13]

In the next section, we will relate the ideas on abstraction developed so far to the case of learning within high reliability organisations. We will first discuss the concept of 'mindfulness' (Weick & Sutcliffe, 2001) with regard to abstraction and then analyse 'concrete' instantiations of abstraction in the introductory period of novice nurse anaesthetists.

Abstraction & uncertainty: the case of anaesthesiology

Ambiguity in the light of mindfulness
Do you think this is air you are breathing?
Morpheus

Organisations that operate in fields like air traffic control, nuclear power generation, fire fighting or emergency medical treatment are studied by organisation theorists under the label of 'high reliability organisations' (HRO) (La Porte, 1996; Rochlin, 1996; Roberts, 1990; Weick, 1987; Weick, Sutcliffe & Obstfeld, 1999; Weick & Sutcliffe, 2001). These organisations have to perform at high levels of reliability and safety, because otherwise people might die. Furthermore, their members rather 'routinely' have to deal with unexpected events, since "their technologies are complex and their constituencies are varied in their demands – and because the people who run these systems, like all of us, have an incomplete understanding of their own systems and what they face." (Weick & Sutcliffe, 2001, p.3). Nevertheless, the fact that these organisations rarely fail is, according to Weick and Sutcliffe (ibid.), due to mindful behaviour prevailing under such circumstances. It is assumed that it is impossible to completely avoid unexpected events or to gain full knowledge of interactions in the system. Therefore, 'mindfulness' (Langer, 1987, 1997) alludes to raised awareness of the fact that every situation might be slightly different and that even small deviations might have unforeseeable fatal effects. The processes of preoccupation with failure, reluctance to simplify interpretations, sensitivity to operations (situational awareness), commitment to resilience (containment of errors, coping with surprises) and deference against expertise (decision making migrates along with problems) aim either at averting the unexpected by detecting it as early as possible or at dealing with it once it has occurred. These concerns are tied together by their joint capability to induce a rich awareness of discriminatory detail and a capacity for action, which Weick, Sutcliffe and Obstfeld (1999) labelled 'mindfulness'.

> "By mindfulness we mean the combination of ongoing scrutiny of existing expectations, continuous refinement and differentiation of expectations based on newer experiences, willingness and capability to invent new expectations that make sense of unprecedented events, a more nuanced appreciation of context and ways to deal with it, and identification of new dimensions of context that improve foresight and current functioning." (Weick & Sutcliffe, 2001, p.42)

March, Sproull and Tamuz (1991) argue that in most organisations (not only in HROs) it is hard, impossible or at least highly undesirable (e.g. aircraft crashes) to learn from large samples of similar events. However, learning does occur nonetheless, and this, in our view, necessarily entails some kind of abstraction. The ambiguity of this is probably most articulate in HROs, since the assumption of stability from which abstraction is derived (e.g. von Glasersfeld, 1995) can be problematic under changing conditions. Thus, 'illusory' expectations antagonise mindfulness:

> "People in HROs try to weaken the grip of this invisible hand of expectations so they can see more, make better sense of what they see, and remain more attuned to their current situation." (Weick & Sutcliffe, 2001, pp.41 f.).

This alludes to the restrictive flavour of abstraction, as discussed above. Abstraction, as general concept, and the process of abstraction can be regarded as vehicle for building expectations. Thus, abstraction might be a 'stooge' to detrimental blind reliance on expectations. However, abstraction is also a necessary means to 'see' and make sense of phenomena. This is what makes up its potential, allowing for quick response as well as handling of novel situations by means of inventive 'translation' from one situation to another. Therefore, abstraction appears highly ambiguous in the light of mindfulness.

Weick, Sutcliffe and Obstfeld's (1999) considerations in this respect are also quite ambiguous and opaque. On the one hand, they stress the importance of continuous refinement and differentiation of existing categories, thus pleading for caution in applying generalisations. In a strict sense, this appeals to processes of continuously abstracting, desisting from any application of formerly built abstractions. In other words, it is all right to construct properties and regularities in a specific situation, but further on, you should not generalise certain perceived relations to other contexts and situations. They state e.g.: "People who simplify reluctantly pay close attention to the details of complexity rather than abstract them away and see more components that can be rearranged in more ways to avoid tight invariant sequences." (ibid., p.105). On the other hand, they emphasise the importance of generalising rather than localising failures, in order to draw lessons from failures or near misses and apply them to other contexts. Furthermore, it is argued that mindfulness is fostered by existing diversity in assumptions (e.g. by diverse backgrounds of team members, job-rotation and so on), so that assumptions per se are only viewed as detrimental to mindfulness, if they are rigidly taken for granted (see also Schulman, 1993). As Ryle (1979, p.129, cited in Weick, Sutcliffe & Obstfeld, 1999, p.101) put it: "There must be […] a union of some Ad Hockery with some know-how."

Abstraction in the foreground of mindfulness, has the potential of creatively coming to grips with novel situations, but the application of abstraction also carries with it the risk of simplification and reduction, ignoring relevant aspects of novel situation. Below, we will explore the flavours of abstraction in one high reliability organisation, the surgery area including the emergency treatment in a hospital, focusing on the way novice nurse anaesthetists are introduced during their first months of work.

Abstraction concretised: nurse anaesthetists learning to handle novel situations

The Department of Anaesthesiology studied here is part of the University Hospital of Innsbruck. With its 85 workplaces (defined job-positions), 130 anaesthetists and 90 nurse anaesthetists (these include 6 to 15 novice nurses) it is among the biggest departments of its kind in Europe. The data presented below stem from a detailed study on the introductory period of nurse anaesthetists, conducted from 09/2003 to 10/2004 by one of the authors. The novice nurses have no special training in anaesthesiology when they start working or learning respectively; theoretical training starts after three years of practice. In the hospital studied, these nurses (amateur and expert nurse anaesthetists) constantly rotate through the diverse subsections and workplaces. Their job mainly consists in assisting the anaesthetist before, during and after a narcosis in operating and/or emergency rooms. In their work, anaesthetists as well as nurse anaesthetists are exposed to high degrees of uncertainty and heterogeneity mostly due to constantly changing work teams and the unforeseeable behaviour of complex human beings (constituting the most important 'object' of their work). The research process was strongly based on ethnographic methodology (e.g. Geertz, 1973), exploring how learning processes unfold under such circumstances. Six novice nurse anaesthetists were accompanied during their first six months of work. Besides participative observation (one work day per novice each month), narrative interviews were conducted with both novice (at the end of each month) and experienced nurses. Altogether 56 interviews were conducted, thereof 36 with novices at different stages of their introductory period. We will particularly focus on how newcomers as well as old hands deal with abstraction, as elaborated above, in their everyday practice.

Distillation & Creation: from broad to finer grained categories

When exposed to a multitude of new experiences, novices initially 'enact' their new environment by constructing broad categories. By building these broad categories novices get a feeling for the qualities of their environment. By applying them to different situations they increase their ability to work on their own. By handling concrete situations and applying the broad categories every novice has created on his/her own, they are able to revise their earlier assumptions. In the course of becoming an expert, the novice takes into account more context variables, thereby constructing finer grained categories. Consider the following examples from the same novice, which illustrates a typical change in interaction patterns:

Observation protocol 23-09-03:

1st month Novice: (question): "How is the tube prepared again?"
Expert: (statement): "I always do it like this" –
[action: shows her how she does it]

Observation protocol 10-11-03:

3rd month: Novice: (question): "How do you prepare the tube in this department? With gel?"
Expert: (statement): "Yes, and I put it there immediately, because […] but with children I use the spray."

The nature of the question has changed. In the first month it can be translated to "How is this done in general?" (aiming at broad categorisation). Two months of work experience later, the novice's question can be translated to "How do *you* do this?". This change could be interpreted as a sign of concept building/abstraction of the form: I cannot rely on my own knowledge so far built and there might be different solutions in different departments, rather than one true solution. That means caution in applying broad generalisations increases. By looking for the conditions of perceived differences, categories are refined according to situation specific circumstances. In the following, we will illustrate these processes in more detail, focusing on the nurses' sensemaking as displayed in the interviews.

- *Broad categorisation in the beginning*

In quotation 2 (section II) we have referred to a novice, explaining how she tries to deal with her new tasks by separating all the various kinds of operations into three broad categories. In this respect, not only the form of the categories made in the beginning are of interest, but also the novice's awareness that these categories are not objectively existing entities. The nurse views them as a vehicle, a transitory stage, on her way towards a more differentiated understanding. As such, it helps the novice in the beginning, but is deemed inadequate at a later stage of work. Experienced nurses, when asked to talk about their own introductory period, also refer to their initial tendencies to generalise broadly, abstracting from specifics. They stress the emotive, motivating aspects of early sensemaking. This gives the novice a certain sense of achievement (even if the categories are revised later on), thus enhancing the passion for learning:

> Quotation 3: "You want to have a red thread to orient yourself. By getting more and more experience you increase your ability to filter out certain things: 'I leave that out', 'I intensify that' 'I do that differently'; The red thread is important for not getting lost at the beginning: It can be hard for a beginner when there are different opinions on one and the same issue. That's why I have a positive memory of having one chief anaesthetist and one experienced nurse at the beginning for a certain period of time. It helped me to slowly realising the differences in opinions in the hospital.
>
> **Experienced nurse, twelve years of work experience**

In their reliance on broader abstraction in the beginning of their career, novices are supported by their working environment. Instructing (experienced) nurses are aware of the need to start training with rather general categories, stressing generalities in the very beginning and leaving out the details for later stages. In our case, this strategy took, for

example, the form of allocating novices first to those departments which have more stable work routines and thus allow easier detection of the 'red thread' of work. Consider the following quotation on that score:

> Quotation 4: "In the beginning I don't bother the newbies with the machines. I begin with the basics and when I see they can handle certain things I increase everything. I believe this is a good strategy because it motivates the newbie. I remember well, the first time I held the Laryngoscope correctly I just felt good. Same thing with the drugs: by increasing your performance you start to see your progress. And then you are happy that you can keep progressing."
>
> **Experienced nurse, twelve years of work experience**

- Finer-grained categories along with more experience

Consider the following quotations, both by the same novice, made four months apart:

> Quotation 5: "Every department is slightly different from the previous one (people, methods,…). This made me wonder what is important. It is the idea of Anaesthesiology and that is important. The details are interesting but not vital for me in the beginning. […] What has to be done when there is an emergency in any department? I guess in this respect all the departments act the same way."
>
> **Novice Nurse, second month**

> Quotation 6: "In the Department of Neurology, I'm experiencing standards that are different frome those in the Department of Urology. I guess this has to do with the different position of the patient on the table. For example Neurology uses gas most of the time, while Urology applies intravenous narcoses mostly. When you ask someone in charge about the difference (processes, methods, medication, use of machines, etc.) you hear about different sets of standards, personal preferences, experience or results of scientific research. There is no non-plus-ultra."
>
> **Novice Nurse, sixth month**

By getting to know his environment, the ability of this novice to set up his own theories increases. From building general theories (second month) he moves on to realising differences (sixth month) and then setting up general theories concerning these differences. The working environment, as mentioned above, supports this learning process. Still, there are certain surgeries that demand a higher reliability (e.g. everything involving children) than a 'standard' surgery:

> Quotation 7: "Interviewer: Are novices involved in paediatric surgery at a later stage?"
>
> "Yeah, because children's surgery is an area where revision of opinion happens very fast. Of all patients, children are at least predictable [The children's age makes a huge difference. The difference between a 25 and a 62 year old patient is far smaller than the difference between a three week old infant and a three year old child. Ed.]. Whenever

there are complications you have to be fast while doing something you have to be aware of doing."

Experienced nurse, 12 years of work experience

Process & Result

- Difficulties in dealing with other people's abstraction: standard operating procedures

The composition of Standard operating procedures (SOP) is deemed an instrument to facilitate certain process sequences. By abstracting essentials from everyday procedures, SOPs might guide and offer orientation in order to enable reliable and stable performance. Novices are confronted with a whole set of written SOPs. Thus they are confronted with other people's abstractions, or according to our considerations above, with abstraction as a result. In the case of nurse anaesthetists, that seems to be problematic to novices:

Quotation 8: "Well, all those standard operating procedures are horrible to read. They all sound so pseudo-intellectual to me. If I were a nursery scientist I would love those standards. Still, those standards waste too much time on stuff that is not essential. E.g. all the patient specifics are not mentioned. I can't imagine a standard that could possibly be aware of those specifics. I read them … I go through them … but in the end they seem rather useless to me."

Novice nurse, first month, with six months of experience at a smaller hospital

Experienced instructing nurses are aware of the limited potential/use of standard operating procedures as well: they stress the purely guiding nature of SOPs, being wary of the dangers inherent in simplification-by-abstraction. Consider the following quotation:

Quotation 9: Interviewer: "Do you use SOPs when introducing novices to anaesthesiology?"

"Not really. I mention various SOPs but not mainly. I tell them that those standard operating procedures are not to be used like a recipe but as a general orientation. I tell the novices that they have to adapt to the doctor in charge and not to SOPs. The more the doctor and the nurse talk to each other, the better – anaesthesiology is teamwork."

Experienced nurse, 26 years of work experience

- Result as process: the routine of mutual checking and questioning

A lot of talk about practice occurs *in* practice (see quotation 9, last sentence) and therefore constitutes an important part of the practice itself. The most discernable pattern in verbal interaction of nurse anaesthetists (novices as well as experienced nurses) concerns the mutual questioning and checking between nurses and anaesthetists (frequent use of phrases like: 'Have you already…?' 'Can I start the machine now?' 'Shouldn't you first…?' 'Do you know how to…?' et cetera). The specific circumstances of constantly changing work teams[14] might play a role in this respect, enhancing the awareness of uncertainties, e.g. concerning the

colleague's experience, knowledge and/or preferences. Therefore, nurses as well as doctors are aware of the necessity of checking and discussing while in action:

> Quotation 10: Interviewer: "Why do you think talking between nurse and doctor is so important?"
>
> "If you believe it is important to know how to do everything, you are wrong. You can prepare all the instruments but the most important thing is to inform the doctor about the measures taken, your status quo concerning this very surgery (e.g. haven't done this in a long time, what has changed) and to consult him on this or that (e.g. do you need anything else?).
>
> **Experienced nurse, 17 years of work experience**

We were able to observe a lot of discussion that went on during work and dealt with different ways of doing things, different work styles, priorities and preferences. This culture of asking questions in contrast to a culture of taking commands (just think of low rank military) can be interpreted as a kind of 'mindful routine'. What is routinised here is a 'not-to-be-taken-for-granted' attitude. The following sequence and quotation 11 underline the value of this kind of dispute over routines.

Observation protocol 29-09-03:

Experienced nurse and novice (male, second month) prepare for a surgery together. It is the novice's first day in this department:

Expert: (Statement/reason concerning the handling of a technical device): "I always leave this to the anaesthetist, because…"

Novice: (Question): "What kind of drugs do you use in this department?"

Expert: (Statement): "The Chief Anaesthetist normally uses … and with the tubes, she prefers…" [Action: preparing the drugs]

Novice: (Question): "How do you handle … over here?" [Action: helping her with the preparation]

Expert: (Statement): "Me, personally, I usually do …"

Novice: (Question – more detailed): "Do you do …?"

Expert: (Statement): "No, not me. Others might."

Novice: (Question – more detailed): "And do you do ...?"

Expert: (Statement): "Yes, we still do it this way. The Chief Anaesthetist prefers … (a special technical device) …"

> Quotation 11: Interviewer: When you happen to be in a new department and all the doctors are new, what is your plan?"
>
> "It's always the same program: you have to orient yourself, you have to ask some questions, you have to adapt and to be flexible."
>
> **Novice nurse, fourth month**

In other words, workplace discourse can be viewed as a 'learning routine'. This routine enables nurses and doctorss to quickly gather specific information about certain departments or the surgery at hand.

How can novices get into this routine of questioning? Novices are explicitly advised by experienced nurses and doctors to ask questions. Furthermore, through the frequent rotation of staff, novices are confronted with constantly changing work teams from day one. That fosters their awareness of multiple 'truths', and in turn, their adoption of the above mentioned questioning routine. Consider the following quotation:

> Quotation 12: "Yesterday, I fixed the endotracheal tube like Ann [experience nurse] has done it the day before. Margret [experience nurse] agreed. The anaesthetist said that this was b|_|11$h!t, so then I did it the way the doctor wanted it to be ... and today I watched how Susan [experience nurse] does it and that was again in a different way! So I decided the best thing would be to simply ask the person in charge: How do you want to do this?"
>
> **Novice Nurse, 2nd week**

- *Re*construction of abstraction in teaching & learning practices

If a novice is told the story behind (the making-of) an abstraction, he or she more easily realises its practical value. If only given e.g. written SOPs or a book on anaesthesiology, the novice might only see its 'academic' value (see quotation 8). Whenever abstracted rules were used during instruction, we noted a strong tendency to relate those abstractions to concrete instances, be it by story-telling and explanation (quotation 13) or by encouraging novices to practice something by themselves to get their own experiences (quotation 14).

> Quotation 13: "I have never done a /insert wicked technique here/ on my own; once there was an experienced nurse who did it and I watched her. Afterwards we talked about the importance of this and that, the dangers and risks."
>
> **Novice nurse, first month, with 6 months of experience at a smaller hospital**

In this case, the experienced nurse not only let the novice watch her performing a technique, but helped him to make sense of his perception by talking about her own abstractions on this technique (e.g. on what she usually pays attention to, etc.). It is noteworthy that this is not done separately in a sort of 'classroom', but is closely related to tasks at work, similar to what Lave and Wenger (1991) termed 'legitimate peripheral participation'. The strong focus on taking part in 'real' practices while learning, is expressed accordingly in the following quotation:

> Quotation 14: "I can explain something but the most important thing is that the novices do it too. When novices tell me they understand it after I explain it, I usually don't believe them. It's not until I have seen them do it successfully that my job is done."
>
> **Experienced nurse, 26 years of work experience**

- Process & Potential

In enabling the reconstruction of an abstraction (from the concrete to the abstract and vice versa), reason plays an important role. An archaeology of applied practices can shed light on 'hidden' contexts. Being aware of those contexts allows for a more flexible use of abstractions, making them applicable in more situations. Therefore, as we hypothesise, this archaeology enhances the potential of an abstraction when applied to new situations in practice. Quotation 15 below expresses the novices' appreciation at being offered abstraction *and* context, whereas quotation 16 already gives a hint as to what makes up the potential of this connection.

> Quotation 15: "I really appreciated it when Markus [experienced nurse] not only told me how he did something but also why he did it that way and that there were numerous other ways to achieve the same goal."
>
> **Novice nurse, first month, with 6 months of experience at a smaller hospital**

> Quotation 16: Interviewer: "You said you want to understand it. Why so?"
>
> "It simply provides security. If I understand something and feel safe doing it, I can deal with stress better. As long as everything goes smoothly, it's all right anyway. But if something goes wrong, if things get critical, when actions have to be taken quickly, then the knowledge of the 'how' and the 'why' decreases my stress level."
>
> **Novice nurse, first month, with six months of experience at a smaller hospital.**

With this statement, the novice expresses very well, in what cases rule-following (acting according to a specific rule) without knowing the archaeology of that very rule is deemed problematic. For instance, if the novice perceives any changes in a situation compared to the situation in which the rule was adopted, it is very hard to judge whether the rule is still appropriate if you don't know the considerations on which it is based. This applies even more in a critical situation, when procedures have to be quick and appropriate because of the patient. According to Weick and his colleagues (1999) it is mainly the rigidity that constitutes the danger of assumptions, expectations and rule-following behaviour in an HRO. Therefore, it is highly relevant to explore the conditions leading to either rigid application of abstraction or to a more flexible and mindful one. Based on our analysis, we propose that it is the *way* an abstraction is adopted that constitutes one major condition in this respect. If novices are encouraged to *re*construct an abstraction (relate it to several concrete cases and/or state reasons, e.g. by telling stories about situations in which something didn't work), they not only adopt the abstraction (as a result), but are also enabled to understand them via abstracting (as a process). This understanding (reference to concrete instances and circumstances), in our view, fosters a more flexible application of acquired abstraction which is vital when people have to handle novel situations. We do not believe – and our empirical data does not suggest – that novel situations can best be handled when people are free of any assumptions or

expectations (which is also hard to imagine). However, when rules are applied based on certain assumptions, it is of major relevance to adapt them flexibly to situation-specifics on site. Having constructed or reconstructed an abstraction by himself, an actor has at his disposal more context factors which might serve as multiple reference points for the application and/or revision of an abstraction when trying to make sense of unknown/unexpected situations. Therefore, we view the process of abstraction (abstracting) as an important factor affecting its potential in handling novel situations.

Potential & Restriction

In section II, we have discussed potential and restriction as flavours of abstraction. In the light of mindfulness, this differentiation depicted the ambiguous role of abstraction in HROs. At this point in the discussion, we are now able to concretise the notion of potential as it applies to abstraction. First, for a novice in a certain field, broad abstraction holds the potential to provide orientation and motivation in the very beginning. Second, applying abstracted rules enables one to focus the attention on specific other, probably more relevant and/or less standardisable things/events. However, this is only a reliable strategy as long as the regularities on which the abstraction is based do not change. Third, sign recognition (based on abstraction) enables quick and early responses, again only if the sign reliably stands for other specifica. Change is a defining characteristic of high reliability organisations. Therefore, all of these potentials may quickly turn into restrictions, as long as one still relies on an abstraction, even though the circumstances are suddenly not the same anymore. Before discussing conditions of either mindless (restriction) or mindful use of abstraction (potential) in HROs we will further illustrate the latter two facets of potential (attention focus and sign recognition) having already discussed the first (broad categorisation) above.

- Attention focus

The following quotation shows how the attention of a nurse is affected by certain perceived stabilities (e.g. standard equipment in different operating theatres[15], see figure 4). Applying abstraction based on these perceived regularities enables the nurse to focus on the spots where uncertainty is dominant. Regularities, however, are not a matter of course. Certain stabilities are not only enacted in order to help novices, but also to facilitate the work of experienced nurses. In the hospital studied, for instance, it is deemed more important to be equipped everywhere with the same model of anaesthesia machine than to have the latest model. In quotation 17, the novice refers to this enacted regularity:

> Quotation 17: "There are certainly things you have everywhere, like how to handle the anaesthesia machine, the equipment of the machine, how to check it, and so on; the other technical devices are the same in each operating room, too. After some time you know what's going on if there is a certain alarm or malfunction. […] These are the things which become routine. They are basic things and are the same everywhere - that's fairly clear - and you can either play with it or relax. But the rest, the things that are tuned to one specific situation vary considerably. You have to focus on and adjust to these things"

Novice nurse, fifth month

Figure 4. *Enacted Stability in an uncertain terrain: standard equipment*

- Sign recognition & Imagination

Quick decisions are vital in surgery. I trainees learn to interpret certain signs as early indicators for upcoming events, they can take certain associated actions in order to either avert the indicated event or to prepare for coping with it. Quotation 18 illustrates this potential in terms of preventing undesired events by reacting (or as the nurse says: 'acting') quickly enough to early signals. Quotation 19 shows that a similar effect can be produced by mentally imagining certain possible scenarios of an uncertain future (in the absence of information about an incoming emergency patient).

> Quotation 18: "You can reach your goal in various ways, even via detours. In a lot of cases, it doesn't matter in the end, which path you had pursued. But I think there are more and less elegant ways."
>
> Interviewer: "What do you mean by 'elegant'?"
>
> "Simply to manage to act rather than re-act. In other words, I have to be one step ahead. I have to use my own mind; I need to imagine what I *could* be facing. That applies to nurses as well as doctors. If I anticipate what will happen next, then I am one step ahead of the patient's problem, and then you will get a smooth narcosis. In contrast, if I'm only reacting, then I'm always one step behind. Suppose there's an abdominal operation: Then I ask myself: Is he dehydrated? Does he have a problem with his kidneys? Does he have […]? You can't find these things in a book, this is a matter of feeling. You can acquire and pass on this ability only at work, through experiencing concrete cases and thereby getting a feeling for discriminatory details, like the colour of the patient's urine."
>
> **Experienced nurse, twelve years of work experience**

Quotation 19: “What I like in this job is that I need to act very flexibly; when I have a feeling of security I feel better.”

Interviewer: “So you think, you are able to handle most of what you might be facing?”

“Yeah, I’d go so far as to put it like that. Nevertheless I am still tense from time to time. When they say, ‘something’ is coming [a new emergency patient, e.g. by helicopter] and I do not get any further information, I imagine the worst-case scenario: in this case I would need this and that. I plan in advance: if the incoming patient has this problem, these actions will have to be taken, and I think to myself: I will be able to manage that. And if the worst case doesn’t happen, super-cool, it’s not that serious, which is good for the patient and for me as well.”

Experienced nurse, five years of work experience

- Ambiguity: Restriction & Potential

As alluded to above, every abstraction is inherently ambiguous. Under changing circumstances, the rigid application of abstraction may rather restrict than enhance one’s problem solving capabilities. The following quotations not only represent typical examples of the possible restrictive flavour of abstraction in HROs, but also show the nurses’ awareness concerning the dangers of too much reliance on certain assumptions.

Quotation 20: “First, I’ve prepared everything and then I come back and the surgical assistant tells me: ‘You know that everything [the surgical scheme] has been changed again, don’t you?’ That means that I’ve prepared for the wrong surgery, because I relied too much on the plan from the morning. First, it was a standard preparation and then I needed to prepare for a more complex surgery […]. Running the risk of a delay is problematic. Maybe the patient has already arrived or the anaesthetist or the surgeons are waiting […] and then they say that this delay is my fault. I have learned that I need to check the surgical plan regularly for any changes in the computer and I do this early enough. You just have to be up-to-date.“

Novice nurse, first month

Quotation 21: “Once, with a child, the maxillofacial surgeon told us that he would only extract two teeth, but in the end it was five. You cannot always rely on what they say. And the anaesthetist didn’t intubate the child. That is dangerous, because the blood can run down and close the airway. That’s exactly what happened, and it’s a life-threatening situation. In the beginning, I had advised him to intubate, but he didn’t want to. He told me that it had worked out well the last time, at that time, it had been also just two teeth being extracted … of course he couldn’t know that it would be five teeth this time. But whenever I can do some troubleshooting, I do it, especially with children, even if it takes more time. That time, I called for help, and fortunately the kid survived.”

Experienced nurse, twelve years of work experience

Quotation 22: Interviewer: "How do you prepare?"

"I look at the schedule, I get to know the patient, and then, you talk to each other, to your colleagues. Then you can decide: this and that will be needed. And if you assume that you do not need to discuss things, then it could very well happen that everything suddenly changes and you will need different things. This causes stress which is avoidable."

Novice nurse, second month

Reviewing our arguments, it seems that we are caught in a dilemma: Stability and reliance on stability are necessary to evoke the potential of abstraction, allowing us to generalise broadly in the beginning (providing orientation and motivation), to focus attention on other things and to react to signs early. But at the same time, trusting 'blindly' in stabilities and rigidly applying abstracted rules, can be detrimental, especially in HROs where lives may be at stake. Why so? Stability in HROs can not be produced nor enacted completely. Even with relatively stable working machinery this is not the case. Only by considering the momentary perceived stability as an enacted product of the team at work and not as a constant entity can nurses apply abstraction in a mindful way or enact the mindful routine of mutual checking and questioning. What do we mean by a mindful application of abstraction? In some cases even 'blind' reliance might be appropriate. Based on our analysis, we view it as the ability to judge whether or not a certain abstraction is adequate in one specific situation and what constitutes its mindful use. This very ability is linked to the way abstractions are built. If encouraged to construct/reconstruct abstractions by themselves, novices not only adopt abstracted rules, but also get to know the context factors which allow them to mindfully apply abstractions to new situations.

IV. Refrain & Chorus

Wallagadagalladilallalalalalalla!
La Linea (upset)

This paper aimed at exploring the role of abstraction in organisational learning. 'Abstraction' was defined here as the formulation of general concepts by recognising shared properties among a number of individuals. First, we discussed several flavours (try to define the taste of salt) of abstraction (distillation & creation, process & result, restriction & potential). The flavours of restriction and potential designate the ambiguous role of abstraction in the light of 'mindfulness' in high reliability organisations. Discussing the case of novice nurse anaesthetists, we explored the use of abstraction in an environment characterised by heterogeneity, uncertainty and possibly death. For this purpose, the flavours of abstraction were used as heuristic device. This led us to 'see' a variety of ways, in which abstraction is built and applied in day-to-day organisational learning. This variety can be connected to the social and organisational context of learning (e.g. to the talk of experienced

nurses about their work practice taking place *in* practice, the perceived (enacted) regularities, or the perceived change in regularities fostered through constant staff rotation). Novice nurses in their very first months displayed a stronger tendency to generalise experiences and to apply abstractions broadly to a lot of concrete instances. Even if this use of abstraction can be interpreted as less mindful, it holds the potential for early sensemaking, guidance and motivation. When discussing abstraction as process or result, we found that novices have a hard time being confronted with other people's abstractions, represented e.g. by standard operating procedures. They quickly 'realise' the restrictive value thereof. In this respect, experienced nurses used such standard operation procedures as well as their own abstractions in teaching practices mainly in relation to concrete instances at hand. Abstractions were utilised during work, enabling novices to reconstruct them for themselves. In doing so, the aim was not for them to learn abstracted rules by heart. Instead, novices were encouraged to experience relevant context factors leading to diverse abstractions. They were given reasons (stories and explanations) for the application of certain rules and were encouraged to ask questions about different ways of doing things. By doing so, they adopted a routine of mutual checking and questioning, a routine which itself constitutes an abstraction. We termed this sort of routine 'mindful routine' or 'learning routine', which aids actors to stay attuned to the specific situation at place. When applied in uncertain terrains, our empirical material suggests that the use of abstraction might serve as a way to focus attention on other relevant things. Furthermore it enables a person to react more quickly thanks to early sign recognition. Nevertheless, these potentials can easily turn into restrictions, as soon as one relies 'blindly' on them, even under changed conditions. Based on our analysis, we propose that the mindful judgment whether an abstraction is still appropriate or not is linked to the way an abstraction is built. Strong reference to concrete instances in teaching and learning practices emphasises the reconstruction of abstraction. This offers flexibility when confronted with novel situations; thus enhancing a mindful use of abstraction.

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Endnotes

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[2] E.g. Lave & Wenger (1991, p. 37): "Further, coming to see that a theory of situated activity challenges the very meaning of abstraction and/or generalization has led us to reject conventional readings of the generalizability and/or abstraction of 'knowledge'."

[3] In this vein, Gherardi (1999, p.116) states: "Disembedding knowledge is an act of reflexive logic which betrays the logic of practice. It inserts distance, reflection and separation between subject and object where previously there was no distinction between subject and the world; both were totally present and caught up by the 'matter in hand'."

[4] We use the term 'organisational learning' as a heuristic device to study how knowledge is socially constructed in practices within organisations, not assuming that such a process *literally* exists (see e.g. Gherardi, 1999, who proposed the neologism 'learning-in-organising").

[5] The term 'distillation' is applied here in the sense of an illustrative metaphor only.

[6] E.g. the name 'apple' (assigned to objects irrespective of their differing size or colour) or the relation of 'gravitiy' (if an apple or other object is dropped, it will fall to the ground).

[7] http://www.imdb.com/title/tt0401792/; found at http://www.filmrot.com/images/sincity-comparisons/-/sincity.html [April 2005]

[8] He gives the example of a one-year-old child applying the expression 'woof-woof' to all moving creatures. (Piaget, 1959)

[9] We are still confused by the weird use of 'levels' in science. As if science was a building and knowledge an elevator. Just consider Enrico Fermi who is said to have put it levelwise too: "I am still confused, but on a higher level." (Alan L. Mackay (1991). A Dictionary of Scientific Quotations. Institute of Physics Publishing)

[10] Further details concerning the empirical study will be given in the second part of the paper.

[11] Consider e.g. Vygotsky (1978, p.28): "The specifically human capacity for language enables children to provide for auxiliary tools in the solution of difficult tasks, to overcome impulsive action, to plan a solution to a problem prior to its execution, and to master their own behaviour. Signs and words serve children first and foremost as a means of social contact with other people.", or more precisely Gherardi (2000, 216) referring to Czarniawska-Joerges, 1991): "Having a concept means that one has learnt to obey rules within a given practice. Speech acts, as units of language and action are, therefore, part of a given practice rather than descriptions of that practice. It is in this sense that language is not only the expression of social relations but also the medium for their creation."

[12] Translation by the authors.

[13] Found at: http://www.iapht.unito.it/giocattoli/it/catapulta.html and http://www.communitydrugteam.org.uk/-/druginfo_cocaine.htm [April, 2005]

[14] It is not unusual for nurse anaesthetists to work together with different doctors each day, sometimes also with several different doctors in several places during the course of one working day.

[15] A splendid metaphor?

A *no blame* approach to organizational learning

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Abstract

High-reliability Organizations (HROs) are those organizations in which even a minor error in their processes may seriously hinder the very existence of the firm, together with the safety of external actors (Roberts, 1990). Past field studies have shown that HROs encourage the reporting of errors and near misses, exploiting these accidents to improve their operative processes. We label this practice as a *no blame* approach to error management, arguing that it enhances organizational learning.

In this paper, by taking a cognitive perspective of organizations (Weick, 1979; Grandori, 1984), we draw on existing contributions on HROs to discuss the characteristics of the *no blame* organization. We mainly build on Weick's theorizing to highlight the following, apparent, paradox: why is it that HROs, which can not afford to commit errors, do not blame operators that spontaneously report them? In this paper, based on two possibility cases, we delineate the theoretical grounding of a *no blame* approach to organizational learning. The existence of *no blame* practices suggests that the exploitation of information deriving from error-reporting may prove beneficial in environments where issues of learning and reliability are particularly relevant. In the final section of the paper we appraise costs and benefits of adopting a *no blame* approach.

Introduction

During a conversation with one of the authors, a commercial flight commander presented us with this revelatory example:

"*Consider the relationship between me (the commander) and the first-officer, my direct subordinate. Nowadays, any divergence in interpreting an indication from the air-traffic control tower is verified. In case of misunderstandings between us, he or she has to openly contradict me, in case he or she believes that obeying my instruction could lead to a situation of danger. On my turn, as commander, I have to constantly bear in mind that errors may happen to me anytime and, thus, verify the situation with the tower before making any decision. In such situations, I am not supposed to take advantage of hierarchical relations. What is novel is that only 20 years ago this would have been unimaginable because, under that rigid hierarchical organizational design, a co-pilot would have never dared to question the commander*".

In airline operations, errors are usually managed while performing other delicate processes, simultaneously, and a lot of attention is devoted to error reporting and resolution. The National Transportation Safety Board (NTSB), which is entitled to supervise air traffic in the U.S., was founded on the assumption that errors are inherent to the nature of human activity. Many airlines operators explained to us that this is mainly due to the architectural complexity of their environment, where the cost of committing an error is often unbearable.

Recent organizational studies have investigated functioning dynamics and structures in high-reliability organizations (HROs) as air traffic control systems, nuclear plants, airlines, and hospitals (Perrow 1984; Roberts 1990; Roberts and Bea, 2001; Haunschild and Sullivan, 2002). These organizations are "highly reliable" in that they experience extremely long time periods characterized by operative safety and organizational smoothness. They are high-risk firms that remain basically "invisible" until the occurrence of an error leads to the collapse of the system in which they operate. For HROs, a minor error in organizational processes may hinder the very existence of the firm, as well as the safety of external actors (Roberts, 1990). In recent years, several contributions analysed the organizational dynamics of HROs (Roberts, 1990; Weick and Roberts, 1993; Carroll, 1998; Marcus and Nichols, 1999; Morris and Moore, 2000; Haunschild and Sullivan, 2002; Ramanujam, 2003). These studies showed how, albeit constantly facing high levels of risk, HROs manage to achieve both operative safety and technical efficiency.

Most interestingly, investigation of *no blame* practices in HROs reveals a paradox. Organizations such as nuclear power plants, alpine rescue units, air-traffic controllers, etc. should not afford to commit errors, since these "*could lead to destruction of the organization and/or a larger public*" (Roberts, 1990: 160). As a consequence, these organizations "*require nearly error-free operations all the time*" (Weick and Roberts, 1993: 357). In everyday operations, though, HROs have developed and maintained a *no blame* approach, encouraging and valuing the spontaneous reporting of errors and near misses. We broadly define 'errors' as unintended deviations from planned courses of actions (Rasmussen, 1988; Ramanujam and Goodman, 2003). We define 'near misses' as situations where corrective actions prevent deviations from provoking adverse organizational outcomes (Tamuz, 1994, Ramanujam and Goodman, 2003).

The paradox lies in the following question: how is it possible for organizations which should apparently "fear" errors the most not to blame operators who admit such mistakes? By paradox we mean an "*apparently self-contradictory statement, the underlying meaning of which is revealed only by careful scrutiny*" (Encyclopædia Britannica, 2005). We underline that we do not refer to a strictly logical or semantic (epistemological) paradox, as discussed in the realms of philosophy (see Ramsey, 1931).

Among the different studies that have investigated the organizational characteristics of HROs, we hold that especially Weick's contributions to organizational design and cognition illustrate how to illuminate this issue. Weick has been among the first scholars to investigate organizational practices of HROs and has introduced a number of theoretical arguments that provide organizational and cognitive groundings for practices of HROs (Weick, 1987; Weick and Roberts, 1993; Weick and Sutcliffe, 2001, 2003). His descriptions of mindful activities in HROs, as well as the attention he devoted to continuous organizational change, stand as a crucial reference for a *no blame* approach. More prominently, we argue that the idea of organizations as scientific communities (Weick, 1979) is the theoretical notion which provides the ultimate rationale for a *no blame* approach to organizational learning, exploiting

a cognitive perspective of organizational practices (Grandori, 1984; 2005). Nevertheless, we believe that we can expand and extend Weick's contributions by developing additional theoretical insights regarding *no blame* practices in HROs, and by outlining the organizational traits that sustain a *no blame* approach.

Our main purpose is to illustrate an approach to error management, defined as "*no blame*", which ultimately fuels organizational learning. In this respect, we try to extend Weick's approach, which is mainly descriptive, towards a more prescriptive usage, and to extend and stretch out theoretical considerations that, albeit suggested, have not been explicitly developed. Our effort to investigate the theoretical basis of *no blame* practices may prove beneficial in order to shed light on such phenomena, as well as to provide a starting point for discussing the potential applicability of these practices within more "traditional" organizations (non-HROs). Although some contributions suggest the potential extendibility of high-reliability practices (Roberts and Bea, 2001; Weick and Sutcliffe, 2001), we perceive a lack of theoretical framework from which to derive precise research questions. In the final part of the paper we move in this direction, by trying to derive from Weick's contributions an exercise of organizational design aimed at elaborating the essential traits of a "*no blame* organization". Finally, we discuss the potential dark sides of adopting a *no blame* approach.

In this paper we draw upon qualitative evidence based on one semi-structured panel discussion held in April 2004 with HROs participants (air-carrier commanders, clinical surgeons and anaesthetists, managers responsible for air traffic control in airports, commanders of alpine rescue units and of fire brigades). The focus of the panel was on the importance of safety in operative processes and on the organizational practices adopted in order to achieve it. The aim of the panel discussion was to obtain first-hand advice for subsequent research. The arguments that emerged from the discussion stimulated our attention toward the issue of blame in organizations and inspired a series of open ended semi-structured interviews with managers and operators of different types of organizations, which were carried out by two of the authors. The organizations included an air-traffic control tower, the intensive care unit of a research hospital, a retail bank, a financial service operator, a telecommunication firm, a manufacturer of selenium chips. In these interviews we requested respondents to describe how their organization managed to achieve safety in operative processes. We then asked them to comment about the general attitude toward blame in their organization and describe whether and how this was reflected in everyday operations. For each organization, we interviewed the head of Operations and the head of Human Resources. The cases described in this paper are based on two of these interviews. The other materials from the interviews are still elements of an ongoing research project.

The paper unfolds as follows. Section 2 illustrates *no blame* practices and serves as a basis for the successive conceptual development. Section 3 highlights the theoretical building blocks that are instrumental in providing a theory of the *no blame* organization. Section 4 outlines the implications for organizational design and evaluates the potential downturns associated with this approach. Section 5 concludes.

From the practices of HROs to a *no blame* approach to organizational learning

The idea of focusing on issues of blame originated from the observation of error management practices in HROs. The two short cases that we describe in this paragraph provide an opportunity for contextualizing *no blame* practices in the everyday dynamics of organizations. We later confront these cases with the existing literature on learning from errors in organizational settings.

Commercial Airlines

Commercial airlines present a case where *no blame* practices have been institutionalized by the industry regulatory board. The National Transportation Safety Board (NTSB) has removed blame from all events in which criminal liability does not apply. Consequently, commercial airlines have adopted and internalized this rule and some have recently launched additional programs to create a more serene atmosphere of collaboration and exchange among pilots. Examples are given by programs as the *Cockpit Resource Management*, which aims at training crews to reduce "pilot errors" by making better use of human resources on flight-decks (Cooper et al., 1980; Helmreich et al., 1999). The citation that opens this paper provides evidence of how such programs affect collaboration within aircraft crews.

The pilots we interviewed agreed that the sources of these practices are connected with the specific nature of the activities they perform. Flight environments are extremely complex, so that any information reported by colleagues or technicians is helpful to gain a better understanding of airplane conditions, meteorological developments, and so on. Chatting with colleagues to discuss individual flight experiences is a beneficial habit that is peculiar to the aeronautic world. Moreover, pilots are specifically trained to pay attention to radio conversations of other flights. Gathering as much information as possible during normal operations is regarded as indispensable, especially at the beginning of one's career, in order to quickly learn the details that derive from experience and are not part of official manuals.

Pilots recognize the role of the NTSB in institutionalizing these practices by requiring formalized error reporting. Pilots and technicians must report, by filling in a specific form, all irregular or unusual facts noticed during operations, including their errors, independently of the consequences of such situations. In addition, specific information systems record every activity on the airplane, so that the failure to report errors or any malfunctioning can eventually be prosecuted by the airline operator. Individuals are then actively involved in a systemic investigation of the features and determinants of the errors they reported. If the investigation identifies an individual shortcoming, this is not prosecuted, unless it falls under the domain of criminal liability. A specific team - that may or may not include the person reporting the error - is then appointed to examine opportunities for improvement and correction. Finally, corrective measures are communicated to all personnel through novel recommendations or formal procedures, depending on the gravity of the issue. When

necessary, procedures and manuals are amended on the base of the investigation. Crews recognize the usefulness of such practices to prevent the occurrence of errors and increase the safety of their working environment.

Intensive-Care Units

The doctors we interviewed worked in the intensive-care unit of a metropolitan teaching hospital. In this case, a structured process for reporting errors has traditionally been absent. Only recently, the hospital managers introduced in every department an experimental practice called the "book of errors". Doctors and nurses anonymously - and voluntarily – write stories related with mistakes and near misses into this book. Every month, managers review and analyse these entries in order to identify corrections to issues that have been raised.

Besides this procedure, though, doctors and nurses claim that is extremely difficult to talk about errors in their environment. The dynamics of everyday work heavily rely on the interactions within the team of people working together. Within this group, relevant information is openly shared and it is common to admit and discuss errors - including the narration of past experiences - to advise other members. This exchange of information usually occurs during day-time, when working rhythms are more relaxed, or during shifts, when it is usual to make a colloquial report of what has occurred during the day or night.

On the contrary, it is highly unlikely to share information with medical staff from other teams, within or outside the department. In this case, doctors and nurses recognize that information about errors does not flow freely, as collaboration is essentially driven by interpersonal relations of trust and respect. No *ad-hoc* procedure is designed to exchange and discuss information on errors and near misses, as doctors and nurses are afraid of incurring legal responsibility for their conduct.

Learning from errors through a No Blame approach: interpretation of the cases

The notion of a *no blame* approach to learning from errors can be traced to a variety of theoretical and empirical contributions. These studies argue that every human activity is characterised by a certain probability of error, which can be attributed to a wrong interpretation of a certain situation, to problematic interactions among people, to a challenging coupling between technology and individuals (Perrow, 1984; McCormich and Sanders, 1992; Roberts and Bea, 2001). In general, learning from errors refers to the notion that organizations can effectively learn from experience, achieving improvements in performance outcomes such as plant productivity, service timeliness and survival rates (Argote et al., 1990; Reason, 1997; Baum and Ingram, 1998; Argote and Darr, 2000). As opposed to traditional organization theory, however, learning from errors aims at gaining precious insights from negative experience, or failures (Sitkin, 1992; Hodgkinson and Wright, 2002), instead of engaging in a search for excellence that might result in self-complacency (Weick and Sutcliffe, 2001), or in a "success bias" (Miner et al., 1999). Organizational errors

can be a crucial factor in enhancing learning (Sitkin, 1992; Kim and Miner, 2000), as they shift the attention focus from superficial to latent relationships of causality, leading to more profound analyses of problems (Reason, 1997). This idea runs against a common managerial perspective that argues in favour of minimizing errors through codified and standardized procedures within and across organizations (see Weick, 2002).

The relevance of near misses and critical incidents is particularly crucial for HROs. March, Sproull and Tamuz (1991) discuss the difficulties in the learning processes of organizations that cannot extensively rely on past experiences. Learning from a sample of one or fewer is a great challenge that asks for alternative learning strategies (March et al., 1991, Grandori, 1992) to all those organizations that, due to the very nature of their core activities, cannot afford a learning approach that exploits the lessons coming from the resolution of a sequence of past errors. For HROs, even an apparently insignificant error can escalate to become a major threat to the survival of the firm and of external actors (Roberts, 1990).

Albeit the high potential impact these organizations have on the environment in which they operate, there have been limited attempts to study their approach to learning from experience (Perrow, 1984; Shrivastava, 1986; Roberts, 1990; Vaughan, 1996), or the lessons that other firms might learn from them (Weick and Sutcliffe, 2001). These studies suggest that HROs are extremely effective in managing their operations and processes because, among other reasons, they

"[…] *design their reward and incentive systems to recognize costs of failures as well as benefits of reliability" and "[...] consistently communicate the big picture of what the organization seeks to do, and try to get everyone to communicate with each other about how they fit in the big picture*" (Roberts and Bea, 2001:71).

These organizations learn to be effective because, among other reasons, they adopt a proactive attitude toward potentially threatening situations, such as errors and near misses, engaging in thorough and systematic analyses that go beyond simple "*blame the operator*" interpretations (Perrow, 1984; Haunschild and Sullivan, 2002). In these firms, organizational culture plays a major role in defining individual attitudes toward knowledge-sharing and, ultimately, organizational learning (Weick, 1987; Cook and Yanow, 1993; Weick and Sutcliffe, 2001; Tucker and Edmondson, 2003).

Drawing mostly on the works of March et al. (1991), Reason (1997), and Weick and Sutcliffe (2001), we define as "*no blame*" an organizational approach characterized by a positive vision of errors. This means that, by relying on a particular set of organizational tools, errors and near misses committed by individuals while completing their tasks are used as a basis for organizational learning. A *no blame* approach underpins a shift in the attention focus from the identification of blame as mere mismanagement of tasks at individual or group level, to its conceptualization as an operational lesson which might enhance future firm performances. Based on the assumption that no system is entirely flawless, a *no blame* system represents a structured approach to managing organizational errors. This view highlights the importance of signalling errors and potentially hazardous situations by creating

"[…] *an atmosphere of trust in which people are encouraged, even rewarded, for providing essential safety-related information – but in which they are clear about where the line must be drawn between acceptable and unacceptable behaviour*" (Reason, 1997: 195).

We use the cases illustrated above to identify three dimensions of a *no blame* system, which are defined according to the terminology proposed by Weick and Sutcliffe (2001). Table 1 sketches these dimensions with reference to commercial airlines and intensive-care units:

Reporting Culture. Widespread reporting of errors and near misses is encouraged and rewarded. Individuals signalling these situations must not fear to incur in organizational blame and punishment, especially if disruptive effects were avoided because of stand-alone initiatives. People are willing to exchange their opinions without feeling under constant judgment. Therefore, operators proactively ask for others' opinions without feeling that they are showing individual weaknesses. A reporting culture drives these assumptions and is essential to communicate errors and near misses.

Debriefing: Individual reports trigger purposeful organizational analyses of possible explanations, based on the interrelations between different elements (people, processes, technologies, culture, and environment). Individuals and groups having experienced errors are actively involved in the process of investigation.

Narrative Enactment: Corrective actions and guidelines for future prevention and/or treatment of similar situations are identified, tested and conveyed by structured organizational processes. These imply, for example, the diffusion of the "story" of the error through narrative mechanisms, in order to share the experience.

		Illustrative cases	
		Civil commercial airlines	**Intensive Care**
Dimensions of No Blame	**Reporting**	Standards forma to be filled in after flights or maintenance operations	"Books of error" and informal practices of narration
	Debriefing	Carried out by a specific commission, involving individuals that reported issues	Socialized within teams, during normal operations (no debriefing outside the team)
	Narrative enactment	Managed by a specific commission that sets new recommendations and rules	Unstructured information exchange during pauses and shift changes.

Table 1. *The essential dimensions of a no blame approach to organizational learning.*

The organizational and motivational side of the system - the *no blame* approach- is the ground for the architecture of procedures addressing error management and error resolution.

In the last decades, production engineers have designed numerous powerful methods aimed at achieving error-free processes and products. Quality control systems and continuous improvement techniques (e.g. Statistical Process Control, Six Sigma) have succeeded in introducing significant improvements in this field (Ishikawa, 1976; Pande et al., 2002). Nonetheless, these methods have two significant limitations. First, they do not entirely account for the "human factor" in production, as errors cannot be easily traced to single individuals or groups directly responsible for them. Second, they do not intercept near misses, or critical situations that are managed locally through exceptional decisions and actions but that, if replicated, may have serious impact on the organization. We argue that these limitations can be overcome by favouring an organizational design that helps systemic interventions, i.e. actions that involve different levels (people, technologies, processes and culture). The *no blame* approach allows for the enactment of these systemic interventions by removing blame from operators and encouraging their participation. Thus, the *no blame* approach is a motivational instrument that supports a systemic perspective of error management and learning.

A systemic analysis moves away from a simple "blame the operator" diagnosis, and can trigger constructive conflict in groups, resulting in better understanding and responses (Jehn et al., 1999; Haunschild and Sullivan, 2002). Attribution theory argues that, when analysing causes and effects of relevant issues, investigators tend to posit attention to the person, rather than to the situation as a whole (Nisbett and Ross, 1980; Fiske and Taylor, 1984; Marcus and Nichols, 1999; Morris and Moore, 2000). When the inquiry is about errors and accidents with serious implications, this tendency is further reinforced, resulting in "*blame the operator*" explanations (Perrow, 1984). This cognitive shortcoming can seriously hinder the possibility for an organization to learn from its own experience (Sagan, 1993) as, once the operator is replaced or transferred, it is assumed that the problem has been removed from the system (Haunschild and Sullivan, 2002). A *no blame* approach can be an effective tool for overcoming such limitations. In fact, *no blame* is about "nurturing" small errors and near-miss incidents in a continuous, incremental process which might prevent overwhelming accidents, thereby eliminating the need for radical, traumatic learning. In this sense, a *no blame* approach might be regarded as a means of making the *how* and *why* of organizational learning more explicit (Edmondson and Moingeon, 1996).

3. The theoretical building blocks of a *no blame* approach

In this section we focus on Weick's theoretical contributions, with the aim of showing that Weick's theorizing provides a number of rationales for a *no blame* treatment, albeit he has never explicitly mentioned this issue (see Weick, 1987; Weick and Roberts, 1993; Weick and Sutcliffe, 2001). These building blocks, moreover, have not yet been exploited in a comprehensive rationalization of the attitude towards errors in HROs. We review them in order to unravel what we label the "*no blame* paradox": how is it that organizations which

apparently should fear errors the most – HROs - are those that develop and maintain organizational cultures and operational practices that embrace the possibility of errors and encourage their reporting?

Out of the works of Weick, three theoretical arguments rationalize and validate the concept of a *no blame* approach: *mindfulness*, *continuous organizational change* and the idea of *organizations as scientific communities with self interests*. Although the three arguments are undoubtedly intertwined, we first present them separately, in order to elicit their peculiar features. We subsequently recognize and discuss their affinities, in order to outline a more comprehensive framework that ultimately supports the *no blame* approach as a cognitive strategy of organizations.

Mindfulness

In different works devoted to HROs, Weick and Roberts (1993) and Weick and Sutcliffe (2001) discuss the notion of mindfulness (Langer, 1989) in HROs. Mindfulness is defined as

"*The combination of ongoing scrutiny of existing expectations, continuous refinement and differentiation of expectations based on newer experiences, willingness and capabilities to invent new expectations that make sense of unprecedented events, a more nuanced appreciation of context and ways to deal with it, and identifications of new dimensions of context that improve foresight and current functioning"* (Weick and Sutcliffe, 2001: 42).

Mindfulness is conceived as necessary for the effectiveness of organizations facing highly dynamics environments. In these contributions, HROs constitute the main reference setting, as they are the organizations which have developed the highest level of mindfulness.

Achieving mindfulness at the organizational level enables organizations to '*complicate, rather than simplify their process of attention*' (Weick and Sutcliffe, 2001: 9) and, thus, to safely and promptly manage unpredictable complexities. A core aspect is the avoidance of a narrow set of expectations which limit the scope of individual attention, in accordance with part of the cognitive psychology literature (e.g. Tversky and Kahneman, 1974).

The elements through which mindfulness is constructed are different, including structural and cultural elements, such as the development of heedful interrelating among operators (Weick and Roberts, 1993). The authors acknowledge that, if on one hand the development of mindfulness is the central purpose of an organization, on the other hand it is crucial not to reject the existence and the possibility of mistakes. HROs are not error free. They organize as to admit the possibility that errors are impossible to prevent but necessary to manage (Weick et al., 1999; Weick and Sutcliffe, 2001). In these organizations, where 'real' errors are unbearable, any smallest failure is a window on the system. Therefore, the recognition and discussion of errors and near misses is necessary to construct a complex representation of the environment, which enlarges the set of expectation of operators.

In this line of thought, the choice not to blame the operator is not explicitly discussed from a theoretical standpoint, but rather taken as an assumption, that motivates employees: its

evidence derives from the ongoing practices in airline operators and nuclear power-stations. This is coherent with the overall logic of collaboration in HROs, where operators interact closely. In these organizations, it is recognized that only front-line operators possess full representation of reality, and that their collaboration is a necessary condition in order to develop the best possible representation of potentially harmful situations. Weick, together with Roberts (1993) and Sutcliffe (2001), illustrates how the presence of insider experts and the recognition of experience are crucial elements of a HRO.

Continuous organizational change

A number of other contributions authored or co-authored by Weick investigate and discuss issues of learning and change (among others: Weick, 1991; Weick, 1995; Weick and Quinn, 1999). The main idea linking these works is that the traditional linear model of episodic change, characterized by the sequence of "unfreeze, change, refreeze" (Lewin, 1951), coupled with the fundamental role of inertia and of intentional intervention, does not fully account for the patterns of organizational change and learning. By recognizing the relevance of ongoing action and improvisation in organizations (Weick, 1995; Crossan, 1998), and by evaluating theoretical and empirical contributions describing non linear and unplanned patterns of organizational change (e.g. Porras and Silver, 1991; Crossan et al., 1996; Moorman and Miner, 1998), Weick and Quinn (1999) discuss the additional paradigm of *continuous change*. Continuous change is conceived as an ongoing, evolving and cumulative phenomenon based on the different sequence of "*freeze, rebalance, unfreeze*" (Weick and Quinn, 1999: 379). This sequence builds on the assumption that organizational learning consists of the development of knowledge linking actions and outcomes (Weick, 1991), and that the portfolio of routines, together with their reframing, *'is the site for learning*' (Weick, 1991: 117). The reframing process sustains the "*freeze, rebalance, unfreeze*" sequence of continuous change (Weick and Quinn, 1999: 379-380):

"*Freeze is to make sequence visible and to show patterns in what is happening, […] to capture sequences by means of cognitive maps, schemas, or war stories […]. To rebalance is to re-interpret, re-label and re-sequence the patterns so that they unfold with fewer blockages. To rebalance is to reframe issues as opportunities, reinterpret history using appreciative inquiry […]. Finally, to unfreeze after rebalancing is to resume improvisation, translation and learning in ways that are more mindful of sequences, more resilient to anomalies and more flexible in their execution*".

According to this paradigm, thus, learning is achieved through a series of small changes in an ongoing and incessant process of updating the organizational response repertoire. Here, we believe, it is possible to derive another rationale for *no blame* practices, in that attention to operations reveals the recognition of a set of organizational repertoires which are attentively monitored ("*preoccupation with failures*", Weick and Sutcliffe, 2001), so that every small error or near miss leads to discussing the connection of action and outcomes, as well as to the

continuous enactment of solutions. *No blame* practices, therefore, help sustain the sequence of "*freeze, rebalance, unfreeze*".

Organizations as scientific communities with self interest

In 1979, Weick discussed the relationship between business organizations and scientific communities, providing a third element on which to build a theoretical framework for a *no blame* approach to organizational learning (Weick, 1979). In his paper, which provides a cognitive description of organizations, Weick theorizes that an organization is a "*body of thoughts*" (Weick, 1979: 42) endowed with epistemological processes to acquire knowledge about its surroundings. Knowledge and the environment are constructed by participants' interactions. Under this representation, the '*collective omniscience of the organization*' becomes the focal object of interest for its description (Weick, 1979: 43), in a way similar to that of scientific communities, where the advancement of knowledge is the main objective of the community.

As subsequently stated by Grandori (1984), the metaphor of scientific communities allows to represent decision making processes of business organizations with the same heuristic rules of scientific research. Consequently, the logic of falsification is regarded as the main engine for the advancement of knowledge (Lakatos, 1999; Popper, 2001). Therefore, the falsification of an existing hypothesis is valuable to the growth of knowledge as it permits to discard the validity of existing hypotheses and to develop new ones (Grandori, 1984). Accordingly, *no blame* practices find their theoretical justification in the decision-making realm, as a necessary tool to advance the collective knowledge of the organizations. As the falsification of hypotheses (current routines) is crucial to advance this knowledge, then, the organization should search for all those events that stimulate enhancements. As their main objective lies in achieving reliable activities and actions, HROs activate *no blame* practices as a medium to investigate the environment. Relationships between the central relevance of reliability and *no blame* are, thus, reinforced.

This enables us to solve the initial paradox: since errors (which may hide a lack of knowledge about the overall system) are most harmful for these organizations, it becomes crucial to strengthen the logic of learning trough falsification, which is activated on small errors and near misses by *no blame* practices. This consideration acquires growing validity and robustness in dynamic environments which are too complex to allow for a complete modelling.

Commentary: the No blame approach as a form of epistemic rationality

Although the three lines of thoughts share an underlying consistency, we still miss an explicit discussion about their connections. We want to cover this point, in order to delineate the theoretical foundations of a *no blame* approach.

From a descriptive perspective, we hold that these three concepts, and relative practices, are complementary, i.e. the application of one set raises the value of the application of practices in another set (Milgrom and Roberts, 1990; Ichniowski et al., 1997):

These three practices share the main goal of developing knowledge about the causal links between actions and outcomes. The main concern is the challenge of actual knowledge, so that expectations (on which routines are based) are regarded as hypotheses waiting to be tested (Weick and Sutcliffe, 2001). Therefore, even if the parallel with scientific communities is drawn in the 1979 contribution only, this view seems to underlie successive arguments as well.

These three practices are not designed to simplify the world, but to complicate it. Weick conceives a successful organization as an entity that continuously questions and tests the outside environment, a concept that is conceived in the notion of "enacted environment" (Weick, 1979, Daft and Weick 1984). Weick encourages the analysis of organizational practices that allow for the complication of reality (Weick, 1979; 2004). The underlying assumption is that the ability to set up and maintain these "complexity-enhancing" practices explains more of successful organizations, if compared to practices that economize on information processing. In 2001, Weick and Sutcliffe restated this notion, by arguing that "it takes mindful variety to assure stable high performance" (Weick and Sutcliffe, 2001: XV). There is a manifest link, thus, between the existence of "complexity-enhancing" practices and the operative performance of organizations.

Weick does not deny the utility of organizational routines and schemata. However, differently from an information-processing view of organizations, in which routines are used to economize on the representation of the environment and to represent a plan and a set for action (March and Simon, 1958), Weick conceives routines as a source of improvisation and enactment. Organizational routines provide the basis for rationalization, acting as a repository for the existing knowledge that links action and outcomes, although they are not meant to constrain the action of actors.

Moving from a descriptive perspective to an interpretative one, the notion of organizations as scientific communities ultimately provides the rationale for a theory of the *no blame* organization. Looking at an organization as an epistemic actor, it is possible to align the three previous elements, thereby exploiting a cognitive perspective of organizations (Grandori, 1984, 2005). Rules and norms display cognitive reduction properties (Grandori, 1997), resulting in economies of bounded rationality (March and Simon, 1958), to face ambiguity and uncertainty in dynamic environments. In the case of HROs, the focus is on the development of useful knowledge, out of weak signals, in an environment so complex and ambiguous that does not allow for fixed rules of behaviour. The problem of knowledge development, thus, is solved by exploiting the small signals deriving from near misses and incidents, which are socialized and rationalized in the organization. By relying on *no blame* practices, therefore, HROs display a form of epistemic rationality (Grandori, 2005), i.e. they enact an epistemic model of rational discovery and problem modelling in front of ambiguous

and uncertain environments. The movement towards knowledge development, via falsification, provides the more general framework. Mindfulness and continuous learning are two vicarious mechanisms that support the effort of knowledge development. A *no blame* approach helps organizations deal with systematic distortions in their learning processes that are due to attribution biases and knowledge stagnation among different units.

By changing their approach to problematic situations and errors, organizations might subvert their tendency to look for reassuring evidence rather than falsification (Grandori, 1984), their inclination to look for a major, single cause rather than for interdependencies among events (Carroll, 1998), their temptation to search for explanations in proximity and similarity rather than for remote, structural causes.

4. Discussion: traits and dark sides of a no blame approach

In the following paragraphs we delineate the organizational traits of a *no blame* approach to organizational learning, in order to move away from a purely interpretative approach towards an organizational design perspective. We first present the organizational design characteristics as derived from the previous two sections. In order to provide a comprehensive discussion, we then highlight the potential obstacles the adoption of a *no blame* approach.

Organizational traits

In section 2, we described the *no blame* approach as composed of three prominent elements: reporting culture, debriefing processes, narrative enactment. Here, using an organizational design perspective, we theorize on the organizational traits that support the *no blame* approach. We contend that from an organizational design perspective this is an expressive concept, supported by the organizational traits reported below. We find that organizational literature considers that similar organizational arrangements (lack of segmentation between activities, few hierarchical levels, distributed and open decision structures) are shared by all organizations oriented toward learning (Burns and Stalker, 1961; Cohen et al., 1972; Volberda, 1999). The elements that we consider as peculiar to a *no blame* organization are the following:

Loose hierarchy with specialization (Weick and Sutcliffe, 2001: 74). *No blame* organizations recognize that repeated experience with different problems provides the necessary repertoire to deal with new events mindfully. They value the experience of "old" operators and turn to them when investigating novel issues (though this does not imply formal hierarchical control). Experienced operators, on their turn, are trained to recognize the incessant complexity of a system. They are conscious of its continuous complexity and are ready to experiment novel solutions. Experienced operators do not always pretend to apply the "good old way out" to new problems. Therefore, in a *no blame* organization, formal hierarchy is present but it is loose enough to shift operative responsibility on specific issues.

People with expertise on peculiar dimensions take operational decisions, while organizational superiors rarely interfere. An example of this is in the existence of bronze, silver and golden rules, as discussed by Flin (1996) and Weick and Sutcliffe (2001), in which managers distinguish different operational spaces (operative, tactical and strategic), allocating and delegating responsibilities accordingly. For example, the improvement of operative procedures may be more effectively proposed by operative personnel, rather than by administrative units. As an instance of this principle, operators should have the opportunity to participate in the investigation and resolution of errors they have reported.

*Commitment to resilience (*Weick and Sutcliffe, 2001). Actors adopting a *no blame* approach do not assume their behaviour to be error-free, as they are aware of the impossibility to foresee every potential outcome. On the contrary, they are trained to recognize that errors and near misses do occur in their daily activities. From an operative point of view, the practices of a *no blame* organization enable individuals to recognize and to be constantly aware of the level of operational complexity. Examples can be found in the design of operative procedures (e.g. by admitting that the operator can act between certain boundaries instead of believing that the operator should stick to a "best solution").

Skills variety: variety across the skills of people and differentiated paths of experiences within the organization are necessary to fuel different interpretations of signals, to foresee possible unexpected consequences, and to strengthen the opportunity of learning. By exploiting this characteristic, a *no blame* organization renders it possible to develop and share an extended repertoire of histories and cases during debriefings. However, this variety must be balanced against an effective system of socialization of everyday activities, in order to allow for a degree of common understanding and language-sharing across individuals. In air traffic control units, for instance, this is achieved by training all the personnel on different tasks, so that everyone has an understanding of the activities and of the problems of his or her colleagues.

Potential costs and barriers of a no blame approach

From a theoretical standpoint, organizational benefits associated with a *no blame* approach might appear as naturally cogent and logically driven. Unfortunately, the implementation of a similar knowledge-diffusion model is not straightforward. Its harmonious adoption is potentially hampered by a variety of organizational and environmental obstacles. Besides design and implementation purposes, awareness of such limiting factors is crucial in order to understand if, and how, a *no blame* approach is a valuable means of organizational learning for all organizations, or for HROs only. At present, this question remains open, as it is not clear whether the implementation of a *no blame* system could imply a substantial investment in redundancy (Roberts, 1990). In this case, organizations would face a trade-off between the costs (in terms of financial, human and temporal resources) of adopting such a system and the benefits (in terms of learning and performance) it would carry. Nonetheless, recent

contributions advocate that all organizations would benefit from adopting a proactive view towards error detection and a shared understanding of corrective actions (Weick and Sutcliffe, 2001). According to this view, "*[...] neither the sausage maker nor the chemical-plant manager is immune from errors that can have far-reaching consequences*" (Roberts and Bea, 2001: 76). To our best knowledge, no contribution has tried to empirically measure the impact of a *no blame* approach on organizations other than HROs.

Here, we try to outline the barriers that might hamper the implementation of a *no blame* system. These include firm-related restraints, which apply at the organizational level, and environmental barriers, which refer to cultural and regulatory issues pertaining to individual countries. These factors are consistent with previous findings on motivational prerequisites and organizational barriers to learning (Sutcliffe, 2001). As one of the managers we interviewed told us, "*[...] unfortunately, valid and reliable knowledge doesn't come for free*".

Competitive pressures on economic and temporal issues

Short–run emphasis on costs efficiency and lead-time containment, albeit operationally effective, may hamper the adoption of a *no blame* approach, which requires additional investments not immediately related with key productive activities and operations (Roberts, 1990). Together with rethinking aspects of its culture, an organization willing to implement a *no blame* system should engage in an investigation of its operational, communication and control procedures, in order to identify areas of improvement. Under competitive and temporal pressures, thus, organizations might choose to ignore warnings that would imply a slow-down or a revision of core activities. Increasing the ability to explore, to process and to evaluate significant information may lead to a decrease in the speed at which a correct interpretation is achieved and established (March *et al*., 1991). Under such conditions, organizational errors may be regarded as "profitable" for organizations to commit (Singer, 1978) and may, accordingly, be tolerated.

Cognitive costs: the dilemma of learning

Emphasis on economic matters leads to a discussion of the costs of investigating the inner dynamics of an organization, in order to assess and redesign better processes. In other words, how much does it cost to hold back and reflect? An illustrative example from Einhorn and Hogarth (1981: 38) may help outline the discussion on the opportunity-cost of investing in learning in order to verify or falsify current assumptions and beliefs:

"[...] consider a waiter in a busy restaurant who believes he can predict those customers most likely to leave generous tips; the quality of his service reflects this prediction. If the quality of the service has a treatment effect on the size of the trip, the outcomes confirm the prediction. With awareness of the task structure, the waiter could perform an experiment to disentangle the treatment effects of quality of service from his predictions; that is, he could give poor service to some of those judged to leave good tips and good service to some of

those judged to leave poor tips. Note that the waiter must be willing to risk the possible loss of income if his judgement is accurate, against learning that his judgement is poor. Therefore, there is conflict between short-run strategies for action that result in reasonably good outcomes versus long-run strategies for learning that have potential short-run costs. That is, would you be willing to risk loss of income by doing a real experiment in order to learn?*"*.

The situation depicts a potential dilemma of learning, or a trade-off between the rewards of investing in learning and the costs of experimenting. In case these costs are viewed as disproportionate, an individual or an organization may simply decide not to learn. However, as the environment grows evermore uncertain and equilibrium states become unstable, organizations face the issue of improving their ability to research, to improve and to explore radically novel courses of action, rather than comparing known alternatives. This makes investments in research comparatively more attractive, if not necessary.

Cultural Restraints

Knowledge is subject to segregation and, eventually, stagnation, for a wide array of reasons (see Szulanski and Cappetta, 2003). Organizational culture is a focal determinant, as it translates into the way division of labour, specialization and hierarchy are defined (Vaughan, 1996). Different obstacles pertain to cultural aspects. Many organizations prove to be extremely rigid and hierarchical, with the consequence that communication flows downward only. Other organizations lack what we define as a "culture of risk", or the awareness of the potential fallibility of every system. This results in a passive, fatalist, and ultimately punitive attitude towards errors, instead of resulting in a commitment to active risk-seeking activities (Weick and Sutcliffe, 2001). In other situations, employees do not report individual errors because they fear that these would be perceived as instances of individual weakness or fault, which would be blamed on them. Moreover, further obstacles emerge in the form of unidirectional corrective loops, or situations in which operators reporting errors are not involved in the subsequent definition of corrective actions. Together with losing potentially valuable suggestions, this situation affects individual willingness to signal further errors. Finally, many organizational settings are dominated by "*do it first, fix it later*" strategies of coping with problems. In such situations, a drawback of empowerment practices results in the fact that front-line operators – those agents more often exposed to dangerous situations, or the organization's "sensors" – are entailed to solve problems on their own, without alarming managers or superiors (Tucker and Edmondson, 2003). This leads to an absence in communication that prevents organizational learning, as the same situation might happen again to other individuals unprepared to solve it. As one of the managers we interviewed put it:

"*Most problems tend to discourage operators, who individually endeavour to clear out challenging situations. There is a widespread tendency to fix errors as soon as they become evident, hardly ever involving the upper levels of the organization or other departments. This*

occurs for two reasons. First, there is a clear difficulty to recognize external causes, or those events that originate in activities operators are not accountable for. Consequently, solutions are searched for locally, within known boundaries, losing sight of the interaction and complexities of the entire system. Second, errors are universally regarded as personal defeats, as individual fallacies or lapses. Operators fear them and become easily discouraged if they manifest themselves publicly, thereby avoiding to involve or to communicate with colleagues. This is a drawback of the capability to take responsibility for one's actions and outcomes which results in a distorted personification of individual mistakes".

Regulatory constraints

Consistently with previous theoretical contributions (Tamuz, 1988; Morris and Moore, 2000), we found that the understanding of critical situations is hampered by legal constraints which impede relevant, yet self-interested, interpretations. Spontaneous reporting and discussion of individual information and experiences is either significantly reduced or subject to biases, omissions or distortions. Legal accountability can trigger information processing strategies of "*defensive bolstering*", which is the tendency to avoid complex or self-critical thoughts (Morris and Moore, 2000: 742). In addition to that, accountability leads to blame-deflecting strategies that occur via the filtering and manipulation of information communicated within the organization (O'Reilly and Roberts, 1974). In many countries, finally, most HROs face a regulatory system in which human errors are subject to criminal liability. Under this legal regime, individuals are often refrained from signalling errors as they fear to be criminally prosecuted. Consequently, many potentially dangerous situations remain latent. This situation triggers a dangerous paradoxical problem, as those organizations that have a pressing need to learn from errors or near misses are impeded to do so by the legal systems in which they operate. Moreover, similar legal regimes force organizations to over-invest in control and safety systems, multiplying financial and human resources beyond necessary. Finally, as stated by Vaughan (1999: 287), "*employees and organizations devote enormous resources to prevent incidents of routine non conformity from being publicly defined as mistakes. […] The social organization of clean-up work also has social costs that eventually are paid by the public*". By shifting blame from organizations to individual operators, institutions preserve their social and public legitimacy.

Conclusions

In this paper, we proposed a *no blame* approach to learning from errors which, in our view, can encourage and facilitate the communication, transmission and sharing of knowledge within organizations. In an attempt to illustrate our approach, we outlined two representative cases and assessed the role of Weick's contributions in constructing and designing our theoretical framework and argumentations. By looking at different theoretical arguments such

as the notion of mindfulness, continuous learning, and organizations as scientific communities, we were capable of solving the paradox initially posed, as well as to endow *no blame* practices with stronger theoretical foundations. We argued that the *no blame* approach represents an instance of epistemic rationality, in which organizations rationally look for a way to structure their actions in ambiguous and complex environments. Building on that, we explored the organizational traits of a *no blame* approach and discussed the potential dark sides of such approach.

In conclusion, we maintain that a *no blame* approach is a valuable means towards "*designing an organization for variability*" (Weick, 2003: 94), in order to grasp the nuances of complexity, instead of the patterns of uniformity and standardization. A *no blame* view could help unlock schemata-reinforcing processes that ignore disconfirming evidence and subvert the over-simplification of thinking practices (Weick, 1979). Organizations would be less exposed to a "*root cause seduction*" trap, or the assumption that one single cause satisfies all problem-solving activities (Carroll, 1998). Firms often restrain employees from engaging in an exploration of multiple causes and chain of events, as the awareness of causal interdependencies may lead to a discomforting feeling of architectural complexity. On a cultural level, this approach is translated into "*do it first, fix it later*" guidelines.

We hold that the main limitation of our study lies in its preliminary stage. We present only two representative cases of HROs that, in different ways, address the issue of error management. These organizations have devised extremely different organizational solutions. While commercial airlines adopt formalized procedures, the intensive-care unit relies on voluntary, socially-constructed processes. However, both examples provide day-to-day insights on the essence of a no blame approach to learning from errors.

Future contributions would benefit from empirically addressing a series of issues and research questions. Some of these refer to the organizational antecedents that favour a correct implementation of a *no blame* system. Others refer to its potential consequence on organizational dynamics. Dimensions such as organizational identity, styles of leadership, openness to upward and downward communication, trust relationships, governance structures, and dynamics of power distribution may determine the success or failure of a *no blame* system. At present, it is yet not clear how. Moreover, research should assess if, and how, a *no blame* approach may be regarded as an intangible asset driving a firm's overall value.

However, we hold that the explicit recognition of *no blame* practices, and of their linkages with environments of higher learning intensity and reliability, may provide a contribution for the appraisal of modern organizations. A *no blame* approach embodies the potential of unlocking the organizational knowledge that resides within the interactions and interdependencies among individuals, units and functions, which are regarded as valuable repositories of information (Carroll, 1998; Ramanujam, 2003). A *no blame* approach may assist organizations in learning from rare events, by widening and enriching the capabilities to grasp the rewards of unique – yet exceedingly valuable – experiences. These unique events would not immediately be dismissed as irrelevant because they represent a "sampling

variation within existing theories" (March et al., 1991). Finally, a *no blame* system relies on assumptions of distributed cognition (Hutchins, 1991; Weick and Roberts, 1993). Accordingly, this approach could be regarded as a means of making entrenched knowledge available to other levels within the organization, thereby projecting locally-available information into globally-shared guidelines and working practices. We believe that the ability to process and communicate information translates into an intangible asset that can drive an increase in a firm's ability to generate value.

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The role of structure in the failure of organizations to learn and transform

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Introduction:

Dramatic changes in the global business environment, brought about by advances in technology and politico-economic competitive pressures over recent decades, are foregrounding the need for organizational transformation. However, structural inhibition of change in organizations seems to persist, in spite of the well-documented role of structure in culture creation and thus mission accomplishment. Almost thirty years ago Mintzberg (1979: xii) stated that 'structure seems to be at the root of many questions we raise about organizations'. Similarly, over the past decade, other authors have targeted organizational structure as *the* critical factor in organizational performance in the digital era (Dell, 1999; Foster & Kaplan, 2001; Miles *et al*, 1997; Peters, 2003). The role of structure has been highlighted in such areas as the capacity of an organization to innovate (Dougherty, 1999; Leonard-Barton, 1995; Barley, 1986); enact strategy (Davies, 1993); become more entrepreneurial (Miles *et al*, 2000); construct new knowledge (Lave & Wenger, 1991; Wenger & Snyder, 2000; Dovey & White, 2005); and meet customers' needs more effectively (Zuboff & Maxmin, 2002).

At the same time, there has been growing recognition in the literature that success in the new era of knowledge capitalism depends upon the creativity of knowledge workers, their passionate identification with the purpose and goals of the organization and their full commitment to enacting its core strategies (see, for example, Boyett & Conn, 1991; Gee *et al*, 1996; Peters, 2003). The capacity of organizations to innovate is increasingly seen to result from collaborative learning and knowledge construction practices that grow out of and fuel the development of intangible capital assets such as *social capital* (resources such as trust and voluntary cooperation between all those who hold a stake in the mission of the organization – see Nahapiet & Ghoshal, 1998) and *morale capital* (resources such as the passionate identification with, and commitment to, the purpose of the organization – see Dovey & Singhota, 2005). The mobilization of these resources, however, requires specific structural and cultural forms - especially with respect to power relations and opportunities for enterprise-wide inter-subjective communication, collaboration and learning (see Dovey & White, 2005).

While leaders in organizations are increasingly realizing that survival in the era of knowledge capitalism requires radical change, their articulation of change often remains at the rhetorical level and seldom addresses the kind of structural change that is necessary for the transformation of everyday work practices. As a consequence, attempts to implement change are often carried out on an *ad hoc* basis within the existing organizational arrangements. Through the case of an Australian financial services company, we explore such an attempt to introduce a set of innovative work practices without transforming the existing organizational structure and culture. The case provides an illustration of how the prevailing functional hierarchical structure inhibits cultural transformation, perpetuates old practices, and thereby

undermines the successful introduction of new, mission-pertinent, work practices. Drawing on Weber's (1970 ed.) analysis of the functional hierarchy (or classic bureaucracy), we show how this structural form - that is still a characteristic of most large organizations – has embedded in it the strategic intention of *control*. We argue that the rational-legal culture perpetuated by this structural form effectively *prevents* the development of the passionate commitment to creative, learning-rich, work practices required of workers for organizational success in the era of knowledge capitalism.

The key implication of our findings is the need for the re-conceptualization of leadership in organizations. We argue that an important role of leaders in today's dynamic business context is that of structural architect. This requires an understanding of the relationship of structure to mission accomplishment, and the ability to transform an organization accordingly. This means addressing the cultural legacy of previous structures, and making explicit and transforming inappropriate mental models and cultural practices in the interests of mission accomplishment. Thus, the most important strategic task for this new leadership is the envisioning and development of a new form of enterprise logic – the 'overall logic shaping a firm's strategy, structure, and management processes into an effective whole' (Miles *et al,* 1997: 7) whereby the focus of the organization shifts from *control* to *results* and power is managed in the interests of mission-pertinent innovation.

Learning and Knowing in the Era of Knowledge Capitalism

It is widely recognized that, in the global knowledge economy of the 21st century, organizational performance depends increasingly upon the capacity of organizations to learn and to innovate. This, as Gee *et al* (1996: 19) argue, requires new collaborative forms of working and the passionate involvement of workers,

> who can learn and adapt quickly, think for themselves, take responsibility, make decisions, and communicate what they need and know to leaders who coach, supply, and inspire them. ... Workers must now take responsibility, usually in teams, for whole and meaningful tasks which they understand and seek to improve ... (and) throw themselves heart and soul into the work of the company in very risky times.

The distributed nature of knowledge in organizations requires that collaborative learning and knowledge construction activities be facilitated, cherished and celebrated. Making this point, Gee *et al* (1996: 58), state that,

> in the new capitalism it is not really important what individuals know on their own, but rather what they can do with others in a collaborative way to effectively add 'value' to the enterprise.

Of particular importance in this respect are intangible forms of capital that are generated and leveraged 'in community' – in particular, *social* and *morale* capital. *Social capital* is a form of capital that is collectively owned by members of a 'network' characterized by strong relationship bonds and multiplex connections to other 'networks' (Nahapiet & Ghoshal, 1998).

This 'capital' consists of social resources that are constructed and leveraged through network relationships and without which the network would not be able to function at an optimal level. The most critical of these resources is *trust* as it underpins the capacity to leverage many of the other resources potentially available to the network either through its members or through its partner networks (connections). Learning and knowing are social capital resources because they are developed and leveraged through specific kinds of relationships (Leonard-Barton, 1995; Choo, 1998; Wenger, 1999; Lave & Wenger, 1991). Once trust, and the social norms of reciprocity and voluntary cooperation that go with it, is established, network members have access to vital *human capital* (knowledge and other resources that are embodied in individual members) and *morale capital* (resources such as passion, commitment, motivation, courage and resilience that are rooted in, what Nahapiet & Ghoshal (1998) call, 'identity resources'). From our perspective, the processes of learning and knowing depend heavily upon the availability of these intangible forms of capital within a network and upon the capacity of network members to leverage them. The unique aspect of these forms of capital is that they are not depleted but re-generated through their exploitation.

The Role of Structure in Organizational Performance

The development of these intangible but essential capital assets requires an organizational structure that facilitates a culture (organizational discourse) characterized by a strong sense of ownership among all stakeholders of the organization. Such ownership is underpinned by a passionate commitment to the mission of the organization; the shared values of its stakeholders; and to creative participation in its everyday activities. Fundamental to such a structure, are lateral, as opposed to hierarchical, power relations [what Gee *et al* (1996: 58) refer to as 'non-authoritarian' distributed power bases]. In such an environment of decentralized authority, risk is managed through the socialization of all members to cultural norms that dictate the framing of all decision-making by the mission and values of the collective and that ensure that learning is viewed as an obligation to the collective. As learning involves personal risk and potential vulnerability, it is highly sensitive to power management practices and flourishes under the supportive nature of the lateral power relations structurally embedded in 'co-owned' organizations.

Recent global political events have highlighted, in a dramatic way, the effectiveness of such an organizational structure. As Friedman (1999) points out, we are currently witnessing a new form of military/political competition in which a 'super-empowered' individual/group, using a decentralized, virtual, organizational form that effectively leverages exceptional levels of social and morale capital, and the new information and communication technologies, in the service of a passionately owned mission, has consistently trumped a global superpower, hamstrung by its hierarchically-structured military and government organizations. The effectiveness of *Al-Qaeda* in surviving the best efforts of the USA to defeat it over the past

decade, has led Tom Peters (2003) to claim that this new global military conflict is not one that will be decided by weaponry but by organizational form.

Functional Hierarchical Structures

After several centuries of dominance, the functional hierarchical (bureaucratic) structure remains the most common organizational form (Jacques, 2003). Over a century ago, Weber (1970 ed.) showed that this form was designed for *control*, not *results*, and was intended to denude the organization of individual passions in the interests of rational-legal administration. He states that, within a bureaucracy,

> the 'objective' discharge of business primarily means a discharge of business according to *calculable rules* and 'without regard for persons'. ... When fully developed, bureaucracy also stands in a specific sense, under the principle of *sine ira ac studio* (*without anger or passion*). Its specific nature ... develops the more perfectly the more the bureaucracy is 'dehumanized'; the more completely it succeeds in eliminating from official business love, hatred, and all purely personal, irrational, and emotional elements that escape calculation. This is the specific nature of bureaucracy and it is appraised as its special virtue (Weber, 1970 ed.: 215-216 – translation of the Latin phrase inserted by the authors)

Weber (1970 ed.: 216) goes on to say that the bureaucratic structure thus requires personally detached and strictly objective *experts* – functionaries who are unmoved by human passion and who perform their function without emotion, gratitude or favour.

The functional hierarchical form was well suited to organizational needs during the industrial capitalist era of previous centuries. Created to transform traditional forms of administration, such as honorary and avocational services performed by members of ruling elites, into specialized administrative functions operating according to purely objective considerations, the functional hierarchical structure enabled the first wave of globalization and the era of industrial capitalism that underpinned it. In that era, when results were more-or-less guaranteed for Western organizations who had easy access to the world's resources (through their colonies) and who could rely on growing, prosperous home markets to absorb whatever they produced, control was of paramount importance and thus the functional hierarchical structure was appropriate to their purpose. In discussing the mass-production model of the industrial capitalist era, Zuboff and Maxmin (2003: 20) make the point that

> it required a new managerial hierarchy with a relentless internal focus on the control and measurement of production and distribution. Managers and engineers inherited the task of planning and overseeing a minute division of labour to accomplish the standardization, increased throughput, and reduced unit costs necessary to meet the new demands of mass consumption.

However, fuelled by advances in technology and new competitive pressures, profound political and economic change has occurred globally over the past three decades and radically different criteria for organizational success have emerged. As Boyett & Conn (1991: 109) point out (supported by Gee *et al*, 1996: 19-21; 58-61), workers in the current era of

knowledge capitalism are required to have a different psychological and emotional orientation to their work organization where the goal is to,

> attach people mentally and emotionally to the workplace – to make them feel intimately connected to the corporation even if in reality that connection is transitory.

While this kind of intimate connection is a necessary condition for learning, creativity and innovation in the current era, it is seriously inhibited by the authoritarian power relations, rooted in positional power bases and serving functional and individual purposes, that characterize organizations structured as functional hierarchies.

Case Study of a Failed Attempt at Organizational Transformation

In order to explore these issues against the backdrop of everyday practices in an organization, we present a study of a failed change initiative at a large Australasian financial services company (hereafter "the Company"). The case consists of a brief 'strategic story', in which the Company's attempt to transform itself is outlined, followed by an interpretative analysis in which we apply our argument to explain how structurally-induced defensive behaviour by the Company's leadership undermined the learning and innovation required to transform the Company.

The Company

Like many organizations operating in today's dynamic business context (see Fenech & Dovey, 2005), the Company has adopted a 'management by projects' approach whereby much of its work is organized as a series of simultaneously executed projects. This approach has facilitated the Company's aggressive new product development program that is focused on information products delivered through communications technologies. A key challenge in such a multi-project management environment is the fact that the demand for projects usually exceeds the resource capabilities of the organization.

Historical Context

The Company came into existence as the result of a merger driven by the threat of entry into the Company's market of a much larger, better resourced, global business. While the parties to the merger possessed distinct histories, cultures, processes and systems, both found themselves in a similar predicament. After computerizing their operations during the 1980s, custom-building at great expense the core business applications that enabled them to leverage economies of scope and scale that their local competitors could not match, it became possible, post Y2K, to replicate these core business applications relatively cheaply. Thus, while technology initially gave each of the parties the means to create the barriers to entry that made

their markets secure and profitable, soon thereafter technology razed those barriers leaving both parties vulnerable to attack from larger players.

Six months after the merger, fears of a much larger and resource-rich overseas competitor entering the market were realized and the Company's share price lost more than 40% of its value as investors anticipated market share to come under increasing pressure. At this time, the Company announced a bold new mission to become the 'leading provider of choice' in Australasia. The Company's strategy outlined a vision of operational excellence (with statements such as 'achieving lowest cost best practice'; 'world class IT enablement'; and 'building organizational capability') and signalled intentions of cultural transformation (with slogans such as 'passion, values and recognition'; 'performance-based rewards'; and the 'encouragement of innovation').

Organizational Structure

The Company restructured itself into five strategic business units focusing on different market segments, and five functional silos (Group Finance, Group IT, Human Resources, Legal and Administration, and Group Sales). Group IT was sub-divided further into four functional silos (Client Services, Infrastructure Services, Product Services and Practices). Product Services, the area primarily responsible for project management and the undertaking of project-based work (predominantly of a cross-functional nature), was also structured as a traditional functional hierarchy consisting four sub-departments (Solution Delivery, Solution Design, Solution Development and Solution Assurance).

History of Failure to Execute Innovative Strategies

Driven by the need to accelerate the integration of the two merged businesses and to engage its new competitor by rapidly developing new products and services, the Company extended itself well beyond its organizational capacity, by over-committing to projects. The Company failed to complete a series of projects that aimed to accelerate the integration process – known as the *Quick Win Projects*– within their scheduled six-month time-frame (some of these projects were still active eighteen months later). With most projects experiencing slippage against plan, the 'hump' of project work that needed to be surmounted was pushed back month after month as new projects were approved and initiated. Estimates for key projects were reported as 'highly at risk' due to an inability to secure the human resources required to undertake critical project tasks. Several of these key projects failed to meet their delivery dates with the result that their anticipated contribution to the Company's EBITDA for that financial year was not realized, and the Company was criticized, with respect to its profit predictions, in the financial press after twice lowering its earnings forecast.

A Bold Strategic Initiative and its Collapse

At this point, the Company responded by undertaking a program (the Program), initiated by the manager of its Program Management Office (PMO), aimed at extending the function of the PMO to include a more proactive and strategic role in the Company's project selection decisions. Specifically, the PMO would manage the legislative framework created by a Program Governance Board (Steering Group) comprised of senior executive managers and the manager of the PMO, with the purpose of ensuring an explicit and transparent basis for project selection and investment decisions. The framework was based on a project portfolio selection methodology (PSM) whereby a portfolio of projects would be selected 'from available project proposals and projects currently underway, that meets the organization's stated objectives in a desirable manner without exceeding available resources or violating other constraints' (Archer and Ghasemzadeh, 1999: 208);

This methodology, recognized globally as *best practice* with respect to managing investment decisions in a multi-project environment, produced significant business benefits over the six months that it was in operation. These included:

- increased project throughput compared to the previous twelve months;
- increased return on investment in projects compared to the previous twelve months;
- stopping several projects that were of dubious value resulting in cost savings and the freeing up of resources to work on more valuable projects;
- establishing an overall plan that sequenced projects over a six-month period according to relative value, subject to organizational and environmental constraints;
- reducing the Company's portfolio of major projects to a more manageable number – from fifty down to twelve;
- building project management competency in project teams.

Despite this success, after six months of operation the Company announced the retrenchment of the PMO Manager and the disbanding of the PMO on the grounds of 'reducing a management overhead'. Without the PMO there to drive it, the project portfolio selection methodology was from that point no longer followed and the Senior Executive Managers ceased meeting as a Steering Group.

Subsequently, over an eighteen-month period, the Company failed to deliver a $15M program of work aimed at re-engineering its core business applications and processes (the largest it had ever attempted), spending most of its capital budget in the process, and the CEO was replaced by the Board. Thereafter, the Company re-established the PMO function, expending significant effort and cost on hiring new personnel, retrieving and reviewing the disused project portfolio selection and related process documentation, and attempting to re-introduce the abandoned work practices.

Resistance to the Program

At the outset of the Program, project owners and project managers viewed the new requirements to provide information about their projects to the PMO as 'more red tape' and as 'preventing them from doing their real job'. In the past, such requirements were spoken of as 'snake oil' and exhortations to 'just do it' would be made, even in the case of large international development projects, with the consequence that contracts were signed that committed the Company to delivery dates without prior feasibility planning. This attitude was reflected in extremely poor reporting, both in quality and timeliness. However, within three months of the introduction of the Program this resistance had dissipated. A training session provided by the PMO was well received by project owners and project managers and one particularly ardent and vocal critic, who had previously refused to comply with the project portfolio selection methodology, became a champion of the process. By the fifth month of the Program's operation, the standard of reporting by project owners and project managers was excellent and, without exception, they had become passionate supporters of the project portfolio selection methodology and the expanded role of the PMO.

In contrast, resistance from functional managers was much slower to arise; however, when it did arise it effectively led to the termination of the Program. Initially, functional managers accepted the Program, following the lead of the CEO who endorsed it at a rhetorical level as 'the way we now do things here'. However, as they became aware of its implications for power management practices within the organization, the new work practices and the mandate of the PMO were challenged, with some managers encouraging their staff to refuse to cooperate. Ironically, the project portfolio selection methodology began to be criticized as being 'bureaucratic' and 'prescriptive' by those who had helped define it and the PMO labelled a 'roadblock' by those who had participated in setting its Charter. Over time, human resources were unilaterally re-allocated from projects by their line managers contrary to project selection decisions made by the Steering Group. Line managers began ignoring meeting requests, telephone calls and emails from project owners and project managers seeking information about human resource availability. In one particular conflict between a project manager and a line manager, the latter asserted 'the right to pull [the resource] off any project, regardless of the project impact'. Personal attacks were made on the PMO Manager and, in contrast to the training sessions delivered to project owners and project managers, training sessions delivered by the PMO to functional and line managers were openly sabotaged.

Reassertion of Positional Authority.

During the operation of the Program, the functional managers of the Product Services Department released new project management and systems development methodologies that contradicted those introduced through the Program. At the expense of best practice in project management and systems development, these methodologies sought to embed into process

standards – by enshrining rational legal processes governing the conduct of all project activities and decision making – power relations that favoured functional and line managers over project managers. A 'waterfall' model was imposed in which project activities were organized into phases that corresponded to the functional boundaries of the Product Services Department, and, rather than entrust projects to autonomous cross-functional teams led by project managers, a serial assembly line process was imposed which required each department to perform its 'phase' of project activities in isolation before handing over to the next department. Under this model, authority for prioritizing activities, allocating specific human resources and approving deliverables lay with functional and line managers, with project managers stripped of the decision-making authority delegated to them by the Program.

Retreat from Transparency.

As functional managers began to understand the implications of the Program for their personal and functional power bases, they increasingly reverted to covert and sectarian strategies - recreating an atmosphere of secrecy and mistrust in the process. An example of this is provided by an excerpt from the *Observations Journal* of the PMO Manager that relates to his request to obtain a copy of the new project management and systems development methodologies shortly before their release:

> I then requested a copy of the document from the Group IT Manager (Product Services) explaining that the CIO had given me his approval. He directed me to the Solutions Assurance Manager who was in possession of the master documents. I then sent an email to the Solutions Assurance Manager. He replied by email directing me to a Consultant who was coordinating the process definition activities, with the suggestion that it was not appropriate for the document to be released outside of IT while it was in draft form. This reply was copied to the Consultant. I then emailed both the Consultant and the Solutions Assurance Manager and explained that I had been given authority to access the document by both the CIO and the Group IT Manager (Product Services). The Consultant then called me to discuss how I would use the document and to extract an assurance from me that I would not let the document be seen by anyone either inside or outside the IT function; specifically asking me not to let the document be seen by any of the project managers. To this I agreed. A copy of the document was then sent to me by email by the Solutions Assurance Manager with a covering note emphasizing 'FOR YOUR EYES ONLY' and 'ONLY A DRAFT'.

To Learn or Not to Learn

Shortly before the disbanding of the Program, semi-structured interviews conducted with senior functional managers, project owners and project managers revealed significant differences in attitudes toward the Program and the learning gained from it. Despite the business results obtained through the new work practices, senior functional managers expressed a preference for the traditional approaches to managing projects (approaches that

had been proven inadequate in the Company). For example, there was a strong preference for the traditional functional organizational form and its sequential assembly line approach to managing projects, over the autonomous cross-functional team approach supported by the Program and generally recommended within a multi-project environment. Preference was also expressed for curtailing the autonomy of project teams and integrating them back into the functional operational structure. Significantly, a number of responses by executive managers reflected an apparent lack of understanding of basic procedural aspects of the project portfolio selection methodology that they had been participating in over the previous six months.

In contrast, at the project team level, project owners and project managers questioned the need for strong functional line management – such as that imposed by the Product Services Department through its project management and systems development methodologies – in an enterprise where most work is organized as projects and where these projects are prioritized, scheduled and coordinated by a Steering Group. Consistent with best practice, they favoured greater autonomy for tightly-knit cross-functional teams, and resented intrusions by functional and line management. They exhibited a sound understanding of the project portfolio selection methodology, the roles of the PMO and the Project Governance Board, and possessed strong opinions about these approaches being superior to what had previously been in place in the Company.

Analysis of the Failure of the Company to Introduce an Innovative Management Practice

The case of the Company illustrates how, rather than foster lateral power relations and engage in enterprise-wide mission-pertinent learning, functional managers were able to undermine the innovative practices introduced by the Program. Initially, while still unsure of the Steering Committee's commitment to the Program, they operated on an *ad hoc* basis, making arbitrary decisions to reallocate resources assigned by the Program to project teams. However, as the reluctance of executive managers to face the political consequences of the Program became apparent, functional managers more aggressively re-claimed authority with respect to project decisions. They did this via two specific methods of power management:

- Managing power ‘downwards’ by re-asserting bureaucratic protocols and procedures that have been taken-for-granted in the Company for decades. The 'logic' of these practices appears to be so embedded in the cultural life of the Company that few employees protested the actions of line managers in arresting the change process at the expense of superior business performance and recognised best practice. Similarly, there was no protest from staff at the destruction of the nascent culture of trust and enthusiasm that the Program was beginning to foster, by the re-introduction of these protocols and procedures. By leveraging the structurally-induced mental models of staff with respect to *power* and its sources of legitimacy in organizations, functional managers were able to sabotage the new work practices in open defiance of the new democratic decision-making processes that had been introduced through the Program.

- Managing power ‘upwards’ through the threat of political disharmony. The re-instatement of traditional strategies-in-action (bureaucratic protocols and procedures and traditional project management methodologies) by functional managers exploited prevailing cultural values regarding competitive individualism, short-term thinking, and the pre-eminence of individual and sectarian interests. At the same time, it effected a revival of the cultural phenomenon of *false consensus* in functional hierarchies. In this ‘game’, all members of the enterprise (wittingly or unwittingly) participate in the charade of strategic planning while tacitly knowing that the prevailing strategies-in-action are the way ‘the world really works’. In functional hierarchies, the process of formulating 'espoused strategies', which cannot be executed, is as much an accepted part of management routine as are the 'strategies-in-action', which are usually not made explicit, but which are easily executed courtesy of the enterprise logic. This results in a situation of strategy-contradiction. When faced with an open rebellion from functional managers, the executive management of the Company very quickly chose political harmony over business transformation and superior results. As salaried leaders, they appear to have viewed such a strategy to be in their own interests. Interestingly, this reversion of the entire executive management contingent to the traditional order occurred without questions about the legitimacy of their strategic turn-around from anyone in the Company other than the PMO manager[2].

The constraints imposed upon strategy execution by the taken-for-granted structure and culture of the organization are invisible because of the socialization of staff within a functional hierarchy. The socialization process reifies structural and cultural conditions, so that they are perceived as ‘natural’. On this point, Zuboff and Maxmin (2003: 21) argue that,

> the standard enterprise logic has become so deeply taken for granted that it is no longer visible. People do not question assumptions that they no longer see. … Change management would not be the industry it is if organizations were changing. Change management is huge precisely because organizations are *not* fundamentally changing. … the standard enterprise logic is organized to reproduce itself at all costs, even when it is commercially irrational to do so. It is through these processes, so often undiscussable, that organizations defy change, even when they say they are changing.

As the explicit logic of the Program contradicted the tacit enterprise logic of the Company, its validity in the minds of all staff was tenuous at best. A consequence, therefore, of the functional hierarchical structure is an organizational culture wherein the link between espoused strategy/values and strategy/values-in-action has been mystified, enabling leadership failure to be easily rationalized (see Sarason, 1972; Gardner, 1965). In this kind of organizational culture, salaried executive managers are able to protect their self-interest through risk-averse and conservative practices.

Functional managers, at first guided by assumptions that the change initiative would fail as many previous change programs in the Company had failed, tolerated the new order until it became clear that this change was being driven by someone (the PMO manager) who was

resolute about its implementation. From our observations, once measured business benefits began to be explicitly documented and tabled at the Steering Group meetings, the moment for open rebellion by functional managers had arrived. At that point they realized that unless stopped immediately, the Program would permanently transform the old order of the Company. Through veiled threats by some, and less subtle forms of aggressive confrontation by others, line managers initially attempted to persuade the PMO manager to allow 'greater flexibility' in the operation of the new practices – a tactic that would have undermined the integrity of the Program and thus destabilized the new order. When this failed to stop the progress of the transformation, the only remaining action left was to sabotage the Program and ensure that the PMO manager was retrenched. Thus, because the logic of the Program could not be resisted on rational business grounds by the executive management of the Company, it brought into play the full range of insidious defensive mechanisms available to those who have a vested interest in undermining change in organizations structured as a functional hierarchy.

Transforming Structural Form in the Interests of Learning

In spite of the increasing signs that functional hierarchical structures are inhibiting mission-pertinent learning in organizations, this organizational form persists and functional 'experts' – who Sullivan (quoted by Peters, 2003) describes as 'very expensive microchips' – continue to dominate decision-making in organizations. Statements, such as that of Deprez & Tissen (2002: 1) that 'the organizations we created have become tyrants. They have taken control, holding us fettered, creating barriers that hinder rather than help our businesses' have had little effect, and the prediction of Boyett & Conn (1991: 109) that 'in *Workplace 2000*, rigid hierarchies will be dismantled, as will ceremonial trappings of power', seems naïvely optimistic in retrospect. As Jacques (2003: 137) points out, over 85% of the workforce in economically developed nations is still employed in hierarchically structured organizations.

The transformation of the ‘deep structure’ of organizations - change that ‘alters the basic structures and therefore affects every premise, assumption and activity that derives from or depends upon those structures’ (Zuboff and Maxmin, 2003: 19) is clearly a difficult task. The relatively recent introduction of the so-called matrix structure with the claim that it offers ‘the best of both worlds’ by preserving ‘the benefits, such as information sharing and continuity, of the functional department structure, while enabling cross-functional coordination on a project basis’ (Payne, 1993: 240) seemed for a while to offer organizations a way to 'have their cake and eat it'. By combining functional specialization with cross-functional business product or project specialization, and superimposing a product or project structure on an existing function-based structure (with resources assigned from vertical units to horizontal units - see Alsène, 1999 and Van Der Merwe, 2001), it was hoped that the constraints of the functional hierarchical structure could be overcome. However, as the case study demonstrates, functional silos continue to dominate decision-making and power management practices in

such hybrid structures (Alsene, 1999; Bishop, 1999; Miles *et al*, 1997; Payne, 1993). As Bishop (1999: 9) argues, 'it is the functional departments (that often control the resources and information vital to the success of the cross-functional team) that can and often do sabotage the efforts of the cross-functional team'. Thus the emergence of the matrix structure can be seen as an example of 'adaptive' rather than 'deep' change, enabling leaders of functional hierarchies to successfully accommodate pressure for structural transformation without fundamental change to the political *status quo*.

With suitable frames of reference regarding the relationship between structure and mission accomplishment, leaders need to explore the range of organizational forms that are emerging as appropriate alternatives to the functional hierarchy. Such forms include *cellular* (Miles *et al*, 1997); *federal* (Handy, 1994); *hypertext* (Nonaka & Takeuchi, 1995); *communities of practice* (Wenger, 1999) and *network* (Lipnack *et al*, 1994) structures. At the core of each of these alternative structures is the concept of stakeholder co-ownership and an emphasis upon lateral power relations between them. These principles, however, may constitute the biggest challenge for leaders groomed in hierarchically structured organizations as they require them to sponsor the process of their own disempowerment – to empower others by transforming the structure of the organization in ways that facilitate the development and liberation of the entrepreneurial capabilities of all staff (Foster & Kaplan, 2001; Boyett & Conn, 1991). The political culture embedded in organizations historically structured as functional hierarchies, makes most business leaders deeply *suspicious* of such a strategy. In a study of the introduction of cross-functional project teams in functionally and hierarchically structured organizations, Bishop (1999: 7) argues,

> ... in many cases, the culture of the firm encompasses decades of established business practices and formal functional reporting structures and … going to a team culture could be personally counterproductive for [it's] leaders, who are the very people who need to sponsor the activity to change the organizational culture!

We have argued that in functional hierarchical organizations control is a more powerful need and entrenched mental model than the need for business results. Thus, it may take dramatic events and crises in organizational performance, such as those predicted by Peters (2003), before such mental models are re-visited. In addition, it may require the same level of publicity and transparency of the results of business organizations as is the case with elite sports teams, for business leaders to elevate the need for results above that for control. Even with the (cognitive) support of the leader, structural transformation is difficult, in that, at the first sign of a crisis, the leader's old mental models about structure, authority and control are likely to be re-asserted and the inappropriate power management practices that emanate from them, to be re-enacted (Kim, 1993; Kets de Vries, 1993). In this respect, drawing on Sarason's (1972) concept of an 'external critic', Dovey & White (2005) argue the need for a extra-organizational role through which the power of those with formal authority in business organizations can be mediated effectively in the interests of relevant organizational transformation.

Conclusion

In this paper we have argued that the role of structure in mission realization needs greater scrutiny in organizations attempting to survive in the challenging global business contexts of the 21st century. In particular, our argument has focused upon the irony that the factors that made the functional hierarchy so successful as a structural form in the industrial capitalist era – namely the 'de-humanization' of the workplace through the principle of *sine ira ac studio*; the functional division of work; and the establishment of hierarchical power relations – are at the heart of its inhibition of the creativity and learning required for success in the era of knowledge capitalism.

Transforming this legacy structure (and the control-focused culture that it creates) will require new forms of leadership – leadership capable of structuring the organization in ways that facilitate the development of a social environment in which passionate commitment to the goals of the organization is the norm; and in which workers are empowered in ways that enable them to participate effectively and creatively in collectively-reflexive strategic leadership practices aimed at the production and delivery of innovative products and services.

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Endnotes

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[2] In the Australian context, the pervasive assumption of hierarchical structures as 'the way the world works' is an unfortunate consequence of the colonial history of the country and the fact that most large organizations in Australia are still externally owned (see Mintzberg, 1983).

Leadership as the source of trust enabling learning and knowledge creation

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Abstract

The paper considers the relationship between leadership and trust in developing and supporting learning processes needed for knowledge development. Two qualitative research projects are analysed considering how leadership, trust, learning and knowledge are affecting each other. The importance of trust was clarified but, more importantly, the notion of trusting as a differentiated set of behaviours was identified. The paper concludes that developing trust is not enough, leaders need to ensure that the theories-in-use and the espoused theories of trust are in line and that, in order to engender trust, leaders must initiate trusting behaviours.

Introduction

There is much written about the role of leadership in the success, or otherwise, of organisational learning (Altman and Iles, 1998; Buckler, 1998; Coad and Berry, 1998; Farrell, 2000; Ill et al., 2000; Montuori, 2000; Poole, 2000) and it is generally agreed that there needs to be top level support of learning processes within companies if there is to be successful knowledge sharing. There is also much written on learning and trust (Kalies, 2004; Mason and Lefrere, 2003; Chakravarthy and Cho, 2004; Baltrusch, 2001) with authors arguing that, unless there is trust by the employees that they will be supported by the organisation, there is likely to be less innovation, experimentation and knowledge creation than the organisation would like. Different levels of trust are recognised within the learning relationships (Mason and Lefrere, 2003; Chakravarthy and Cho, 2004); trust needs to be developed at the level of individuals (especially between peers), between employees and their managers and between different parts of the organisation, if new knowledge is to be successfully created, shared and utilised within companies.

It is argued that trust is a key part of learning and knowledge because the role of trust is to create an environment in which employees feel safe to take risks, are sure of no blame, being encouraged to develop the commitment to the organisation that will support learning and knowledge sharing (Crookes and Froggatt, 2004). It is, therefore, logical that there must be a relationship between the behaviour of leaders and the development of trust. This in turn will impact upon the success or otherwise of knowledge development within an organisation. It can be argued that if leaders behave in a way that engenders and supports trust relationships, then the learning processes, especially as they pertain to the transfer of knowledge, will be more likely to be effective. Figure 1 shows a model of knowledge acquisition and highlights the learning processes that will need to be established if there is to be effective knowledge utilization.

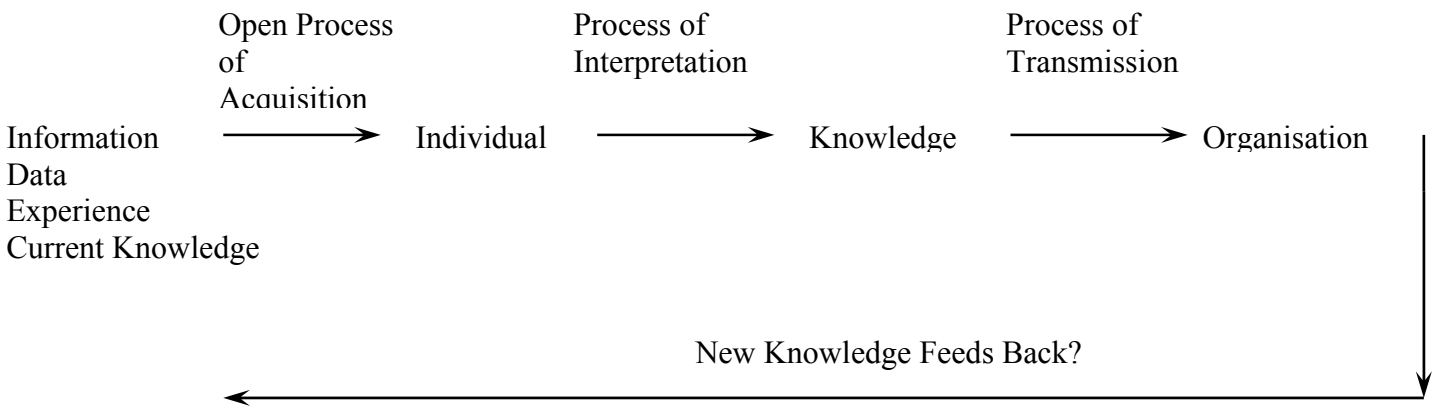

Figure 1. *Model of Knowledge Acquisition - Source: Blackman, 2001*

What can be seen is that the processes of acquisition, interpretation and transmission will be vital for the success of knowledge development. Only if the individual is prepared, ready and able to share the newly acquired knowledge will organisational competitive advantage be encouraged (de Geus, 1997). Moreover, the organisation must be ready to accept the new ideas and must be open to stimuli from the environment (Blackman and Henderson, 2004). Blackman (2001) and Coopey (1995, 1996) both argued that a dominant coalition, for example strong organisational leadership, could alter the potential for organisational openness by predicting and preempting what is to be learnt. It is argued that such a dominant coalition may, potentially, prevent the effective development of effective learning as the processes will begin, not with new ideas but with preferred behaviours and ideas determined by senior members of the organisation.

This paper considers the relationship between leadership and trust in supporting appropriate learning processes, particularly considering the impact of the leadership voice and the difference that this makes in the belief that espoused theories-in-use of trust will be translated into theories-in-action (Argyris and Schon, 1996). The argument will be made that clear leadership behaviours are required, but that the role must be clearly defined in terms of enabling trusting and learning, not merely developing trust per se.

Methodology

The paper is based upon two projects undertaken in Australia, both of which were concerned with developing further understandings of the state and nature of learning. There were two reasons for using both data sets. Firstly, in both cases the role and importance of leadership was considered and the data sets proved to be complementary, with the themes

emerging from the analysis stressing the central role of leadership and trust. Secondly, one of the companies in Project One was the same as the company in Project Two. This enabled an interesting comparison for verifiability.

Project One

The first project sought to determine the nature and possible success of organisations in terms of becoming Learning Organisations. The objectives of the study were: to understand how organisations prepare for and meet the challenges of an increasingly complex, competitive and globalised world; to understand how organisations prepare their members for these challenges and to compile an inventory of the key enablers, as well as barriers to learning organisation development. Because it was determined that there was a need to understand the nature of the problem being researched and the cognitive structures within the organisations, a qualitative approach was adopted (Cresswell, 1994). Data was collected from nine case companies ranging in size from 5 to 4000 employees (although this large company is split into divisions and only one product and area were researched), of which some were owner run and managed, whilst others were major corporations. It was the location of the companies that was of initial interest in order to consider how learning and knowledge were being developed in Western Sydney, Australia. Accordingly, the sample was mixed, as it was thought that different patterns might emerge in different sizes and types of company and that such differences could then be explored. Interestingly, however, the patterns were very similar across all the organisations. In order to get as broad an understanding as possible of a range of voices, the method was designed to get a picture of the views held throughout the organisations. 27 semi-structured interviews were undertaken, each lasting approximately an hour, with employees from differing levels within the companies and 4 focus groups were also undertaken in order to consider if discourse changed when employees were in groups rather than being interviewed independantly. The data was then entered into NVIVO and coded for themes.

Project Two

In the second project, the purpose of the study was to determine whether the individual elements of a learning organisation as defined by Slater and Narver (1995) and Senge (1990) were present in a specific organisation [Company 2 from Project 1) and, if they did exist, how did the managers and staff who were interviewed operationalise them? The organisation in question is a not-for-profit Christian welfare organisation, which employs in excess of 3000 people, has an annual turnover of approximately 120 million australian dollars and provides a diverse range of community, health and counselling services across NSW. The research was conducted as a qualitative case study, with evidence being triangulated from three sources: firstly, in-depth interviews with ten professional managers and twenty staff from two of the business areas; secondly, the researcher's direct participant observations at meetings and,

thirdly, documentary evidence drawn from official minutes, plans and communications from the two business areas. The qualitative case study methodology was considered the most appropriate for the research for several reasons: the work was exploratory in nature seeking to discover ideas not to confirm theory and, therefore, the richness of qualitative data was needed; "case studies are widely used within organizational research" because they enable the complex phenomena to be explored within their context (Locke, 2001, p.15); cases are concerned with providing a description of individual or multiple incidents, which enable the comparison of data (Bartlett et al., 2000); a further consideration was that case studies were particularly useful when the number of variables was large (Burns and Groves 1997; Yin 1994), as in this case, where there are at least 10 elements said to reflect a learning organisation.

Two distinct strategies were employed to canvass subjects for the study. The first strategy targeted 23 of the organisations most senior managers, 10 of whom expressed interest in participating in the research. The remaining 20 subjects were self-selecting in that the researcher canvassed for volunteers via the company weekly organisational newsletter posted electronically to all staff. The criteria to be included in the study were that the staff must have frontline positions, being in frequent contact with clients/patients/customers, be fulltime, have completed the company induction and orientation programme and have worked for a minimum of twelve months. For this paper, the interview data will be the primary source of evidence. The interviews were transcribed and then analysed for codes and themes within the NVIVO package, thus enabling the two projects to be compared and jointly analysed for this paper.

Analysis and Findings

In all cases, the interviewees were asked how their leadership, processes and structures supported their new learning and knowledge creation. A series of themes within both projects were identified as affecting the propensity of the leaders to enable and support trust and learning. These were: the type of leadership undertaken; the role of the leaders within the organisation; the level of risk and entrepreneurial activity encouraged; the role of the leader as a communicator and the impact of the organisational leadership upon the credibility and perceived expertise of the organisation itself. These are all explored in turn for the two projects, identifying the issues affecting learning development within the organisations.

Type of Leadership Observed

The leaders in both projects were analysed in terms of whether they were transactional or transformational (Charbonneau, 2004). A transactional leader focuses upon linking job performance to rewards, ensuring that employees have the necessary resources to succeed in their work whilst applying contingency leadership theories in a way that focuses upon

achieving the task in hand. Transformational leaders work to change the organisation to fit the environment. Their focus is upon developing employees to be able to undertake their work in an autonomous way. Their tools include open and enabling communication and the ability to enact and share a vision (Charbonneau, 2004).

It can be argued that trust is easier to develop with transactional leadership as it is negotiated and more direct; however, it is also much easier to break as the parameters are very clear, so that critical incidents affecting the psychological contract are easily observed (Crossman, 2002). Leaders are often seen as being synonymous with the organisation, so if either a leader or the organisation is perceived to break their word, trust is lost. Thus, if there is a mismatch between the espoused theory and the theory-in-use, trust will be lost. Transformational leaders would also be seen as synonymous with the organisation, but the psychological contract will be quite different because the trust will not be about actual tasks but about their role as a leader and supporter. The employee will have differing expectations which will be linked to some of the sections considered below.

There were very few discussions about actual vision within the interviews for Project One, even though one of the questions was "How do you prepare for the future" and there were discussions pertaining to both developing knowledge to maintain and develop competitive strategic advantage and preparing to outdo the competition. Only company 2 stood out as having staff who thought that their leadership was inspirational, which was the company researched in Project Two. The other companies were more directly focused upon job performance and this was correlated by the way that development programmes were seen to need to be linked closely to skills and job knowledge development rather than creativity or novelty. However, even in company two differences were noted *"I think my present manager is transformational. I think the leadership … is transformational like up the higher echelons. … I don't see any transformational leadership from Head Office"*.

What was argued in both projects was that where there was transformational leadership relationships were less formal, being more likely to support change, whereas where the leaders and/or managers were focused on the day to day business there was less likely to be a culture of innovation and risk. It was also mooted that managers and leaders said they wanted innovation but when risks were perceived as being taken, it was made clear that this was not actually acceptable. Thus, the leaders' theories-in-use prevented learning processes of acquisition which might lead to radical change.

Leader as a developer/mentor/coach

One of the questions in Project One was 'Does this organisation encourage you to gain new knowledge and skills? If so how?' This led into a conversation regarding how employees were supported to develop themselves and then transfer that new knowledge to the organisation.

All the companies in Project One had systems for encouraging learning and knowledge development but they were the traditional models of appraisal and training. Only two interviewees (both from company 2) mentioned the concept of coaching and one of these mentioned mentoring. It was clear from the responses that the senior members of the organisation saw their role as encouraging learning, but not always in ways that would facilitate growth rather than skills development.

In Project Two, however, there was a greater feeling of leaders needing to develop others more generally: *"One of the joys of leadership for me is to allow people to develop and encourage people to develop and then to see them develop and that sometimes means that you lose them because they move on to bigger and better and greater things"; "I could go to either of my managers and say "Well I feel I have a weakness here" - for example I said to one of my managers "I still get very nervous with public speaking" even though once I get up there and I'm fine with it I'm still a mess before, so I'd like to go and do Toast Masters, even though having been a teacher, I'm used to doing it in front of kids but in front of adults it's different. So, ahem - and yeah and things like if I, if I have ever identified a need where I've had a shortage whether it be learning or otherwise it's always been encouraged and always been supportive".* Nevertheless, for many, development was still seen in terms of training and appraisal processes that were unlikely to lead to real personal development.

It seems, therefore, that where leaders do display mentoring and coaching behaviours focussed upon development rather than competences, there is likely to be more diverse knowledge creation. However, this is not the common set of behaviours at this time; although it seems that the senior members of the organisations were likely to believe they were developing employees, their employees did not feel this was occurring, other than via a not particularly effective appraisal system.

Leaders encouraging risk and entrepreneurial activity

The data from Project One made clear links between the culture of the organisation, the leadership and the propensity for risk "*No not really, we're not encouraged to take risks; basically the organisation is owned by* [CEO] *as I said if any risks that needs to be taken that's probably him that needs to take it. Generally speaking most of us employed here are fairly conservative, in cultural terms, low on consensus high on intensity, where by basically try not to put ourselves in positions where we're going to make mistakes* [Company 8]; "*I have been encouraged* [to take risks] *since day one to be initiative, creative to push the barriers, shove the envelope, challenge processes, all of those things, without consequences. Without negative consequence I should say"* [Company 2]; "*If problems arise, we can't let them sleep. Our staff are encouraged to deal with problems, not to hide them, or put them away, but equally important to consult on those problems, this goes to risk; but it's not a culture where there's a great deal of tolerance towards people, in a maverick way, going off and doing what they think best"* [Company 4]. In the case of Company 2, where it is a one of

a set of companies, the interviewees made it very clear that risk taking and innovation were encouraged for their company where there was a culture of support and guidance, but that the other parts of the company did not show such tolerance and support of risk.

There was a clear link expressed in the data between risk taking and problem solving "*Not necessarily take risks; certainly solve problems based on experience and willingness to get a project over the line for budget and to fill the requirements that are listed down by the specification"* [Company 8]*; "Yes, indeed we are encouraged to resolve any problems ourselves and it's only when we can't resolve it, whether it's through risk or whatever that we either resort to back to New Zealand so that we can get help with this particular problem, whatever it might be. Yes, there's an eminent risk that"* [Company 9]; "*I have to say at the lower end of the scale, yes, but we're very restricted as regards taking risks. We don't have the free reign as I think a lot of us would like. We're encouraged to solve problems within our own areas. Yes, often you'll have a situation, sort of say well think of a best way and fix it, because we are not changing, so there is usually if we've given some initiative to solve problems within our own areas."* [Company 9]; *"think they encouraging the risk taking,* [areas manager] *particularly sort of says, 'if you think it will work, give it a go and comeback to me'. Problem solving and critical thinking, I think it's encouraged at the two tier level which I'm involved in which is the management level, and the actual site level"* [Company 2]. This is an important mental model as problem-solving and risk-taking are not the same thing and, if confused, may lead to leaders believing they are supporting innovation when, in fact, they are merely encouraging incremental improvement.

The role of the leader in setting the culture of risk taking was also identified: "*I* [Managing Director] *try to encourage risk taking, but I don't know that the other managers always encourage risk taking with their staff, because they may feel what's going to be the consequence of these, and what risk and how do you evaluate that risk. We are looking at the moment at risk management strategies of identifying what is risk and high risk, low risk, a catastrophic risk, and all that. I don't know what we do in that strategically methodology, logical way to reassure people, but they need that if they are going to do it"* [Company 2]; *"No, taking risk is part of life, taking risk is what you do ,they keep* [the organisation] *in touch with reality"* [Company 6].

In the same way as the differences between parts of the company were seen to matter for Company 2 in terms of culture, the role of leader in that culture was clearly identified as well. It was posited that there were problems at higher levels but that *"we are well supported by [regional manager] who always cares and defends his staff. It is safer for us to take risks and encouraged to explore new opportunities as he makes this a key function of who we are and what we do"* [Company 2].

Interestingly, the lack of the discretion to take risks was sometimes seen as a disincentive *"we have to have the approval from New Zealand … Personally I find it's quite frustrating"* [Company 9];

The importance of leadership acting in a way that encourages novelty was also recognised in Project Two. Moreover, the feeling that the culture permits experimentation was also shown clearly in the level of risk that is permissible: *"Our leader is an entrepreneur and is always out there way in front of the rest of the pack of entrepreneurs often are. He's usually 4 or 5 years ahead of the rest of us I think in his thinking and in his action."; "I mean pretty much I'm left to be an entrepreneur to develop my staff, to do whatever I want to do with those programs, and I feel trusted and if I make a mistake I feel very open that I can admit to that mistake and say "Oh well I made this mistake for these reasons, and, and in future I'll do it this way or whatever," but there's never any persecution or punishment or anything like that"*; "*My General Manager does encourage me to provide innovative ideas for, for strategic management in learning and development".*

What is seen here is that if innovation and experimentation are encouraged then effective learning processes will be supported and new knowledge created. The key appears to be whether the organisation is prepared to trust its employees to take real risks and have the interests of the company at heart. If this is so, then the organisation will encourage knowledge utilisation and, potentially, sharing because the employees will feel safe to continue. However, where all risk is seen in terms of problem-solving, as seemed to be the view in the majority of cases in the interviews, this will not encourage new knowledge as the focused nature of the responses will prevent radical solutions (Blackman and Henderson, 2004).

Role of the leader as a communicator

Responses from both projects stressed the importance of communication in developing and sharing new ideas and enabling change: "*I think good communication and team work is our culture"* [Company 5]; There was considerable emphasis on the role of communication as a way of sharing organisational goals and visions, as well as being a key element of enabling all employees to feel involved, thereby facilitating participation in decision-making: *"Dialogue and discussion is common, in the group, and they often, they run a lot of their meetings by themselves without me being there and I, I come half way and I come in the middle of a discussion and they don't even look at me they just continue on with their discussion and I'm thinking Oh, I don't get any recognition, but then I think well that's good, because I shouldn't be the focus of attention the minute I walk into that meeting, that it should just continue on as business as usual"* [Project 2].

Overall it was argued that open communication leads to open discussions and greater possibilities of the learning processes remaining effective: "*Communication is key to share the information so it can be learnt and become knowledge. Withholding information enables power bases to develop and reduces knowledge development"* [Company 2]. Thus, a key role of leadership must be to ensure that communication acts as a conduit for learning rather than merely information sharing (Smith et al., 2003).

Leader as a source of expertise (seen as a face of the organisation)

There were elements of this seen in Project One in that many of the managers in particular felt that their role was to develop strategic plans and directions, so that preparing for the future was a key element of their role. Therefore, their need to be experts in their given field was seen as an important part of their identity.

In Project Two, however, the senior managers' roles are so broad that they cannot be expected to have the full range of knowledge required to develop strategies: *"if I try to tell them how to do their job they will be extremely offended so I think its about having a very flexible approach where you can assess what each manager needs".* The skill of appointing experts, then enabling them to do their job, was deemed as the critical role. Rather than be seen as needing to lead with expert power, their trust and credibility was seen to be developed by enabling the experts to work autonomously. This supports Clutterbuck's view (1999 in Crookes and Froggatt, 2004) that effective change needs leaders whose expertise comes, not from day to day management, but from enabling others to act in the organisation's best interests.

The latter notion, which implies deep seated trust for the experts and their ability to develop long term strategies for the organisation, would seem to be more likely to engender innovative knowledge acquisition, if only because the encouragement of new ideas from a range of minds cannot but help to increase the knowledge present. The trust, however, is vital or the new ideas may be acquired by the experts but not shared with the organisation. This logically means that what is meant by leadership expertise may need to be reconsidered.

Discussion

What can be seen from the above are two recurring themes emerging from the data, these were the need for innovative leadership and the need for trust, which enables leaders to support learning and knowledge creation processes. In some cases, there was a great deal more innovation and this was directly attributed to a feeling of trust in the organisation that emerged from a feeling of complete trust in the manager. In one case, the responses were the same at all levels of the organisation, with all interviewees citing the role of one manager as fundamental to the success of learning and innovation in the organisation. It was stated that he "*will always take care of you and would never let anyone else in the organisation punish you for a mistake"* and the *"of course the real thing is he trusts us and we trust him".* In other cases there were differences between the responses of interviewees at different levels of the organisation. Whilst senior management argued that there was trust and leadership support, the employees were less convinced and indicated that management would punish mistakes and did not really support learning as they indicated. There was a feeling that the rhetoric and the reality were not the same. It seems, therefore, that in terms of trust all employee voices need to work together, all having the same message and believing that trust is truly possible throughout the organisation. Where there is dissent amongst the voices on the subject of trust,

it will inhibit learning and knowledge creation. The paper concludes by outlining how managers need to understand the elements of trust, in order to ensure that the messages that are sent throughout the organisation are believed by the employees, thereby engendering trust in the leadership and, therefore, trust in the organisational commitment to organisational learning and knowledge creation.

This supported current theories of their importance but identified a difference between trust and trusting that warrants further discussion and may explain some of the differences between the responses at different levels of the organisations.

Trust and trusting

The elements identified that related to the central theme of trust in terms of encouraging, supporting or threatening it, were:

- Culture
- Climate
- Honesty
- Information and Knowledge Sharing
- Right Moral Position
- Doing what is Right
- Opposing what is not right
- Integrity

However, the elements identified as being related to the theme of 'trusting', were:

- Demonstrated loyalty or commitment
- Passion for what you do
- Competence and a willingness to learn
- Preparedness to take risks
- Taking personal responsibility for your actions

Whilst these notions of trust can be seen widely within the literature (McShane and Von Glinow, 2005), and this research supports these findings so far, the notion of trusting as being derived from different sources and behaviours emerged as a critical element within this research. The difference appears to transpire for two reasons. Firstly, from a disparity between leaders' perceptions of how trust develops and is engendered, versus the observations and judgements made by employees considering espoused theory, the organisational ideal and the theories-in-action, which demonstrated what was actually permitted and encouraged. Where there were differences between these notions, trusting was unlikely to develop, no matter how many elements of trust appeared to be in place. Secondly, many discussion on trust focus upon the employees trust for the leaders. This research indicated that there must, initially, be demonstrated trust in the employees by the leaders, for the reciprocated trust to develop which is requisite for effective knowledge sharing.

Matching espoused theory and theory-in-action

In both projects concerns were raised that the gap between rhetoric and the reality present reduced the effectiveness of the organisation in general and the trust relationships in particular. This was seen to affect the trusting behaviours 'demonstrated loyalty and commitment', 'preparedness to take risks', 'passion for what you do' and 'taking personal responsibility for your actions'.

Loyalty and commitment: Leaders within the studies indicated that they demonstrated loyalty and commitment in trusting their staff to do their work well and without constant supervision, which reflected the espoused culture: "*It's more that trust they know what they doing, I don't know their job and I don't understand it enough. I don't think I'd be skilled enough to say, as far as tendering that, that's what those guys do. That's their job.*[Company 2, Project 1]. *"When you come in, it's like you walk into this big family and they say, "come in, we'll take care of you. You do what you got to do, we trust you know what you are doing*" [Company 2, Project 2]. "*That has to be fostered in sort of team environment if you like, so I think there is varying degrees of mistrust, and suspicion, of ego, of competition and all of those things, I think they all exist. Probably existed everything in line you know to some degree. I wouldn't like to sort of say, "oh, no, we all get together, everybody opens up, discloses and all of that.. I tend to think that to varying degrees they do"* [Company 2, Project 1]; "*Culture wise there is a great loyalty to the company. Many of our staff have been here, like, I've been here for 13 years, many been here long term, and I thing that's because generally speaking within our job roles to kind of balance what I said earlier, within the job roles there is a fair amount of freedom to do so once we set up a job role in a job profile, then individuals have fair amount of freedom to work within that. Within the company norms that actually work"* [Company 8, Project 1]*; "My staff are all very loyal because I look after them"* [Company 1, Project 1]..

It is clear that trusting is seen to need to be reciprocal.

Preparedness to take risks: It is evident from their commentary that, for managers to relinquish control, they have to have confidence in their employees. This confidence often extends beyond that of professional competence and involves a significant degree of personal trust: "*well I try and encourage learning. I think learning leads to growth. Training leads to repetition perhaps - I don't know if you can be that glib about it, but and I'm quite happy. I think if a, if a good degree of learning takes place in experiencing failures and mistakes, and whatever I'm quite happy for that to happen. Usually the mistakes are not devastating so there's plenty of room to do it"* [Company 2, Project 2]. However, some staff felt that there was a difference between what was said and what was done: "*We do bits and pieces of it, we don't follow it right through, that's a bit of a dilemma, that we're having any moment and I'm trying to workout how we can do that. I suppose it's because its something that, I think leads to a good way both empowering people and getting them involved, which is a little bit foreign*

to the holding company's view on how we should operate. And that's because they are holding company views such that this knowledge and asking around, I think we've got this fear that we'll be going to go off on a tangent and lose our way. Always feel like, I'm sort of every now and again going to sort of [innovate] *slightly someone's going to crack a wipe or something, "get back in line", sort of thing"* [Company 9, Project 1]. Where such differences were identified it reduced the propensity for innovation and new knowledge development.

Taking personal responsibility for your own actions: It was stated that, despite claims that the organisation welcomed creativity and diversity, in fact the case was very different "*that culture, I guess, has been in this organisation for so long that we don't trust anybody to do anything so we centralise all functions and we've got a long way to go in trusting our people enough to decentralise"* [Company 2, Project 2]. This links with the point above that although staff were told they could take responsibility, many times this was not actually supported. This automatically violated the trusting relationships.

Passion for what you do: This passion extends beyond just a commitment for what is done, it is about an overall passion for the organisation, its culture its traditions and its purpose: *"I liked the vision and values, and I was irritated when people wanted to change it mainly for marketing purposes. South Sydney wouldn't change their colours, and so why should we change something that was made a hundred and fifties or something years ago where I see myself as the CUSTODIAN of the Missions values and beliefs, not as the owner of it. It's presumptuous of those people in that room to try and change it.*" [Company 2, Project 2]. The passion is not only expressed in terms of enthusiasm and motivation, but has a much deeper feeling that *"I would defend my organisation and what it stands for against threats to its values and beliefs"* [Company 2, Project 2].

Overall, it was clear that trusting behaviours were less likely to emerge where discrepancies between espoused theories and theories-in-action could be clearly delineated. Managers and leaders will need to consider the source of such trusting behaviours and actively seek to eliminate violations, whilst developing relationships and processes which will support learning via such behaviours.

Leaders initiating trusting behaviours

Schein (2002) argues that if there is a lack of trust between employees and their leader there will be ambivalence towards learning and the development of new ideas. However, this is usually interpreted as needing to develop trust on behalf of the employees. In this research we argue that, initially, the leaders need to demonstrate trust in the employees via trusting behaviours which will set the precedent and develop stories which will frame the norms for trust in the future. Employees see this demonstration of trust and, from this, feel safe to push the boundaries further: *"Just let's you go, sort of, and puts trust into but if you don't do it*

right I think he'll call you back in" [Company 2, Project 2]*; "mistakes are seen as personal opportunities or growth opportunities. However, if the mistake is repeated I've found that the tolerance then will become less for the same mistake which is fair enough"* [Company 2, Project 2]; *"but the thing was that I focussed on supporting them, not managing them. So I don't tell anyone what to do much, cos what's to do is fairly obvious, and apparent and you, you don't need to tell people what to do, and so all I need to do is get out of the way, give you the tools and the room to move and things to do"* [Company 2, Project 2].

Time plays an important role at this stage. Relationships involving trust often are developed through painful experience, the key is that all parties are given the opportunity to test and experiment until trusting emerges. This is why there must be demonstrations of trust in both directions and why, to initiate trust development, the leaders may need to demonstrate trusting behaviours before the employees will reciprocate.

Personal Responsibility for your actions: Leaders that we spoke with indicated that they valued highly demonstrated loyalty and commitment in their employees. It is acknowledged by at least some of the managers that this needs to be fostered and developed and should not be automatically assumed: *"Encouraging employee commitment and sense of purpose and feeling of family. I think that's probably - didn't happen overnight I don't think, but I think that across the whole of our organisation with our conferences we've had and the way we talk to people and do things. ...I suppose the bit about that is that we've got a lot of, lot of loyal people that are working really hard for us"* [Company 2, Project 2]; "*The processes I guess is a culture that we have tried to develop, culture that does not penalise mistakes and error, one that encourages culture that encourages experimentation, how that actually operationalised if you like, enacted is by the behaviour of Senior Management Team. It's about inculcating a culture of people being able to be truthful and not necessarily fear consequences of their truthfulness and honesty. This is enacted through meetings and relationships"* [Company 2, Project 1].

In this sense, managers are taking the responsibility for creating a culture where commitment and loyalty are valued; the expectation is then that the employees exhibit behaviours which demonstrate their loyalty and commitment

Competence and a willingness to learn: Leaders recognized the importance of having a skilled and competent workforce. It is unlikely that trusting would be developed unless employees demonstrated at least standard competencies and or a capacity and willingness to learn them. "*some of the managers on the other hand are very expertise in gathering information they have tertiary studies behind them and umm they're more mature as in they've been around for longer they're more likely experiences behind them".*

Preparedness to take risks: The acid test in the trusting relationship, according to most leaders, centers around their preparedness to allow their employees to take risks and tolerate

failure: *"I think that my current manager has a lot to do with it because he invests so much trust in me that he just lets me do what I want and he knows that if I need help I'll come to him, whereas if I was working under someone that was constantly looking over my shoulder I wouldn't be able to do the job that I'm doing so it sort of comes with the person and I think he gets that, he has the same relationship with his manager"*[Company 2, Project 2].

Tolerance, patience and courage are all traits valued by employees in their leaders; the notion of unconditional support is often tacitly expressed by the leaders and their staff. It is this supporting or trusting relationship that is the source of trust, enabling learning and knowledge creation in organisations because openness will be maintained, as the processes outlined in figure 1 are less likely to be undermined by senior leaders dominant cognitive frameworks. It is because of the potential constraints that may emerge from ideas held by the organisational leadership that employees will need to have real trust demonstrated via the trusting behaviours, if they are to feel safe to learn, experiment and utilise their new knowledge in an innovative and new way.

Conclusion

This paper has explored the relationships between leadership, learning and trust. The theoretical importance of leadership in developing trust in order to support learning processes has been supported by this research. More importantly, a difference has been identified between the notions of 'trust' and 'trusting', with the latter being considered to be the core behaviours necessary to support the learning processes of acquisition and transmission that will lead to knowledge creation and utilisation. The paper argues that leaders need to concentrate on developing trusting behaviours within the organisations, rather than merely concentrating on the elements of trust. By doing this, they will be exemplifying trust rather than expecting it. It can be argued that such an approach would change the processes needed for learning and employee development, as the foci will not be upon certain aspects of trust but upon developing behaviours that will engender trusting. The authors contend that this different perspective needs further research in order to clarify the differences between the two ideas and how to identify and develop strategies that will enhance long term learning and knowledge creation.

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Collecting regional learning network as constructing possibilities for learning

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Abstract

The aim of the paper is to study the early stage of the project "Regional learning network for tourism business in Eastern Uusimaa" as a process for organizing and constructing possibilities for learning in multivoiced dialogue between different actors.

The learning networks represent a new form of project activity financed by the Workplace Development Program of the Finnish Ministry of Labor. The purpose of the learning networks is to increase the developmental expertise of the participants, to create and experiment with new forms of development cooperation between research and development units and workplaces, and to generate new, innovative solutions for Finnish working life.

The learning network analyzed in the paper is regional, united by the geographic area of Eastern Uusimaa, situated about 50 km from Helsinki, and by tourism business there. The first stage of the project was going on from 1.9.2004 until 31.1.2005, and, aimed to create the learning network in collaboration with Porvoo - Borgå Unit of the Helsinki Business Polytechnic Helia, Helsinki School of Economics (Unit of Organizations and Management), University of Helsinki (Department of Education) and Helia School of Vocational Teacher Education. Other actors consisted of companies, as well as other regional organizations working with tourism business in the area. Porvoo – Borgå Unit of Helia has coordinated the project.

The common interest uniting the participants in this learning network was not taken as given but is perceived as a common object at the first stage of the project, and, as an object of learning, too. Three different forums have been created in order to enhance and create dialogue between different actors and in order to perceive, what the new kind of learning network could be. The first one of the forums, Helia's internal work team, met every other week. The second forum, the expert team that includes representatives of regional tourism enterprises and organisations as well as researchers, met once a month. The third forum combined all the actors involved in the project, including regional tourism enterprises that are mainly small and medium-size enterprises in the Eastern Uusimaa area. This learning forum was organised as an open seminar, based on the ideas from the interviews of the entrepreneurs and on the planning done in the work team and in the expert team. In addition, in this paper, also the interviews are perceived as learning forums. The different discussion forums and interviews of entrepreneurs have been audio taped and written to memos that constitute the main data of the paper.

In the process of constructing this regional learning network there seems to be a challenge for perceiving and conceptualizing the region and the regional identity. An inspiring research question will be how the region and the regional identity will be conceptualized in the common dialogue in different forums. The concepts of region and regional identity have arisen from the discourses in these three forums, but especially in the common seminar.

The activity theory and especially the concept of a zone of a proximal development (ZPD) provide a fruitful theoretical and methodological framework for the paper. Based on the preliminary analysis of the data, the hypothesis is that in these different forums there is going on a process of perceiving a ZPD on the regional level. Consequently, some inspiring questions have arisen. What is Eastern Uusimaa as a region, and, how is it perceived and presented in the discussions in the different forums? The paper will be an experiment for using the concept of ZPD on the regional level. This framework enables to inspect the concept of region and regional identity, both as a tool for perceiving and constructing ZPD as a regional level and as an object of the learning network.

Introduction

The learning networks represent a new form of project activity financed by the Workplace Development Program of Finnish Ministry of Labour (TYKES-FWDP). The purpose of the learning networks is to increase the developmental expertise of the participants, to create and experiment with new forms of development cooperation between research and development units and workplaces, and to generate new, innovative solutions for Finnish working life.

The learning network analyzed in the paper is a regional network, which aims to enhance research and development in tourism business in Eastern Uusimaa situated about 50 km from Helsinki. The first stage of the project started 1.9.2004 and continued until 31.1.2005. The purpose of the first stage was to create the learning network in collaboration with Porvoo – Borgå Unit of Helsinki Business Polytechnic - Helia, Helsinki School of Economics (Unit of Organizations and Management), University of Helsinki (Department of Education) and Helia School of Vocational Teacher Education. Other actors consist of companies as well as other regional organizations working with tourism business in the area. The project is coordinated by Helia Porvoo - Borgå, and, it could be understood as an endeavour to take seriously the challenge of doing regional developmental work that is the so called the third task of the polytechnics in Finland.

The Finnish higher education system consists of two sectors: universities and polytechnics. The polytechnics are more practically oriented, training professionals for expert and developmental posts. The 29 polytechnics in Finland are mostly multi-disciplinary regional institutions that place particular emphasis on cooperation with business and industry. The polytechnics also carry out research and development relevant to their teaching subjects and to actual working life. The polytechnics award professionally oriented higher education degrees that take 3.5 or 4 years. (Ministry of Education 2005.)

Helia, Helsinki Business Polytechnic is the largest business polytechnic in Finland. It offers degree programmes in business management, information technology, journalism, tourism, and management assistant training and organizes vocational teacher education programmes. Helia works closely with the business and industry to address recent challenges

in working life. Helia's business partners can also profit from an array of specialized services, including customized training and marketing research services. (Helia 2004.)

The common interest uniting the participants in this learning network has not been taken as given but has been perceived as a common object at the first stage of the project, and as an object of learning as well. Different learning forums mentioned above were formed in order to enhance and create dialogue between different actors and to perceive, what the new kind of learning network could be. The main idea was that all the actors involved would be equal and that the research and development topics would arise from the dialogues between the different actors. Because of that, naming the different forums (the work team, the expert team) was problematic and contradictory like; each forum presents expertise, not the expert team only. In this paper, we will try to describe the learning network project as a learning process, based on the preliminary analysis of the gathering stage of the project.

Different learning forums have formed a step-wise process that has resulted in the project plan (named development plan) for the second stage of the learning network during 1.2.2005 – 31.7.2006. The development plan was accepted by the Ministry of Labour (TYKES-FWDP) 4.4.2005.

Eastern Uusimaa as a context of the learning network

Eastern Uusimaa is a province of ten municipalities about 50 kilometres east of Helsinki and the capital region of Finland. It has a long and rich history: a chain of 90 prehistoric strongholds was established along the coast of the Gulf of Finland in the first millennium. The stronghold of Linnamäki hill in Porvoo was founded as early as the Viking period in the 9th and 10th century. The Great Coastal Road, later the King's Road, meandering along the Southern coast since the 13th century, was a route of national importance that connected in the beginning the towns of Turku and Viipuri. Porvoo, the second oldest town in Finland, was founded apparently in 1347, lies still on this road. One of the highlights in history of Eastern Uusimaa is the Diet of Porvoo in 1809 when Finland was annexed to Russia after approximately 700 years of Swedish rule. During the Diet Finnish estates took the oath of allegiance to the Tsar of Russia. The results of the Diet were that Finland could keep its Lutheran faith and the own legal system dating back to the Swedish era. One could say that Finland was raised among the nations of the world as an independent Grand Dutchy within the Russian Empire. The built environment in Eastern Uusimaa remains the oldest in Finland. 11 % of the buildings are constructed before the independence of Finland in 1917. Manor houses, old iron works and traditional rural cultural landscapes are numerous in Eastern Uusimaa. Not to mention older wooden centres of small towns and municipalities with grey stone churches. Often manor houses are still in their original use as farming estates. Cultural heritage lives strongly in Eastern Uusimaa. The home of Finnish national poet J. L. Runeberg is located in Porvoo. Porvoo hosts in the summer series of concerts including among the others Avanti!. Loviisa has its Sibelius days and Sipoo concerts for violin. Eastern Uusimaa is

the second most industrialised region in Finland. About half of the regional gross national product comes from the industry. The biggest industrial plants are the oil refinery in Porvoo and nuclear power plant in Loviisa. Eastern Uusimaa produces also ice cream, electric goods and chocolate. Touristical position of Eastern Uusimaa is connected to the vicinity of the capital region, contemporary culture, cultural heritage, history, living countryside and archipelago. Most of the visitors are one-day trippers or excursionists but the number of overnight visitors is relatively high, also. We can divide Eastern Uusimaa to three different touristical sectors that run through the region from East to the West: Archipelago, cultural Eastern Uusimaa and countryside. (Mikkola 2004.) One challenge in this region is to combine these different regions to one integrated Eastern Uusimaa.

The conception of learning as a framework of the learning network

When the gathering stage of the learning network started, there were discussions in different forums about how the learning would be understood in this project. Quite soon, it became obvious that learning should not be defined very strictly in the beginning, but taken as a research object in the project. The question of what kind of learning processes will take place in the learning network would be the essential research question for the entire learning network -project. One aim of the project will be to conceptualize learning in network.

Hence, learning was perceived in this project as a quite open process and taking place as multiple and being connected with new forms of cooperation. According to Toiviainen (2003) learning in network can be perceived as a multilevel process. The levels are understood to be the levels of activity. Such levels of learning could be for example an entire learning network, an entity comprising some of the participants in a network, an individual workplace or an expert organization, team, or individual. The levels are special and local, and, they can be recognized based on the object of cooperation and on the outcomes, and, by studying activity. (Toiviainen 2003; see also Alasoini 2004; Knight 2002; Vesalainen and Strömmer 1999).

It is relevant to study, what is going on in the network. What will be produced? What are the outcomes to be realized? The target of the cooperation and learning is to direct the future. It is essential to question, how the network should be extended and how the learning results and knowledge could be transported between the different levels. Is there a need for new intermediate levels that would create connections? Partnership can be seen as a way of making possible multilevel learning processes. (Toiviainen 2003, 2004)

Learning is related to what is tried to create and generate in cooperation. It is essential that cooperation and learning have some objects in the network. In our learning network, the challenge is basically to shape, what the common object/objects could be. (Ibid.)

During the process of gathering the learning network, we found fruitful the theoretical and methodological framework of the Activity Theory and especially the idea of a collective zone of a proximal development and expansive learning process (see Engeström 1987, 2001). Basically these ideas relate the learning processes in a network to the process of perceiving

common object/objects of network. In the chapter 6, we will inspect more carefully these ideas of expansive learning and collective zone of a proximal development. We will also present preliminary assumptions of how the different learning forums support progress on the way to the zone of a proximal development of the learning network. Before that, in the following chapter 4, we will describe the different learning forums as working modes in the learning network. (see also Hakkarainen 2005)

The gathering stage of the learning network

The aim of the gathering stage was to collect a learning network (by the end of January 2005), which would enhance research and development activity in tourism industry in region of Eastern Uusimaa. All actors in the learning network were supposed to be learners and equal partners. In the long run the aim was also to study and model new forms of cooperation between companies and higher education institutions. The idea was that the learning network would enhance innovations, which would benefit all the participative actors.

During the autumn 2004, the aim was to build a shared vision among the actors and together with them on what a learning network could be and what could be the forms of its cooperation. The core ideas of the learning network were flexibility and openness. The network was intended to be open for new actors. According to the basic ideas of learning networks in TYKES-FWDP, dialogue and new modes of cooperation could be a way to respond to the innovation challenges in current Finnish working life.

Actors of the learning network

Porvoo – Borgå Unit of Helia coordinated the project. Other higher education institutions involved were Helsinki School of Economics (Unit of Organisation and Management, University of Helsinki (Department of Education) and The Helia School of Vocational Teacher Education. The Regional Council of Itä-Uusimaa and Posintra Development Organisation represented regional knowledge and expertise. Porvoo Tours as a small tourism company and Finnair as a national carrier presented the companies in the gathering stage. All these actors participated in the work of the expert team.

The recruitment of other tourism companies and actors started 21.9.2004 with a press conference and press release. During September – November 2004 altogether 15 company interviews were gathered, and, the culmination of the gathering stage was the Learning network seminar 22.11.2004. There were 36 participators in the seminar including 15 participators from the tourism companies and/or organizations.

The project was coordinated by a project manager and two project workers, who all were employees of Porvoo – Borgå Unit of Helia. The actual project planning started with making a schedule for the entire project. The schedule included the major forums in which the plan was worked out as well as other prominent activities in Helia. The purpose was that the

learning network project should be aware of other activities such as other projects and developmental practices and progress, staying in dialogue with them.

Different learning forums as working methods

Different learning forums worked in dialogue between each other's and consisted partly of the same participators. The essential basis for the gathering stage was constructed by company interviews that were planned in cooperation with the project workers and the internal work team. Findings from the interviews were inspected in the work team and in the expert team, as well as in the common seminar.

Basically the interviews and discussions on them constituted the basis for the seminar. Further, the ideas picked up during the seminar were used as tools in the discussions of the work and expert team, when perceiving the vision and ideas of the learning network and its targets in the future.

The internal work team

The internal work team that consisted mainly of lecturers, acted as a support organ and it was intended to be creative and dialogic by its nature. The work team met once in every two weeks, seven times altogether. The aim was to integrate the learning network's functions, as a part of the polytechnic's every day educational work. The internal work team was a learning forum where important themes were discussed, such as the programme and working methods for the seminar 22.11.2004 and ideas that were generated through company interviews. All the meetings were recorded and documented as memos.

The expert team

Another important forum was the expert team, which met once a month, four times altogether. The voices of tourism entrepreneurs, knowledge of the Eastern Uusimaa area and regional development, tourism education, teacher education as well as research and development were represented in the team. The first discussion was on expectations the expert had in relation to the learning network project. The second meeting covered the ideas received from the seminar. The last two meetings focused on planning the future and the development plan for the second stage of the learning project.

The company interviews

During the autumn 2004, 15 tourism entrepreneurs and actors were interviewed. The aim of the interviews was to find out what kind of research and development needs these organizations had. The starting point for the interviews was to listen to the entrepreneurs, in order to get a view of their business, needs and future expectations. This approach proved to be fruitful, as the interviewees felt that they were able to have an influence on the content of the learning network project.

The interviews revealed many cooperation needs. Several interviewees wanted to take part in the planning of Helia's education and student intake. In the future, a big challenge for service companies is to get personnel with the right service attitude. Therefore, cooperation with educational institutions will be more and more important. Seven organizations offered work placement for Helia's students and five thesis contracts were made as a result of the interviews.

Almost all the interviewees wanted the learning network project to coordinate and conduct research and development work in the tourism field. This far, consumer behaviour and customer profiles have not been studied thoroughly in the Eastern Uusimaa area. Foreign tourists tend to associate the Finnish nature with Lapland. The archipelago and sea nature in the Eastern Uusimaa offer a remarkable potential that has not yet been utilized enough.

Another focus area where help was required was product innovation work. Most of the tourism companies in Eastern Uusimaa are entrepreneur centred with no or only few employees. There seems to be a lack of time, energy and capability for development and innovation work. New product ideas are needed especially for shoulder months in the winter season. Also developing business processes would help the entrepreneur to survive. Sustainable development is one of the corner stones of future business development. In a small, entrepreneur driven company, this could mean getting another person to share the responsibility.

Learning network that offers the participants a chance of learning to know each other and deepening cooperation in the future was appreciated especially among the new tourism entrepreneurs in Eastern Uusimaa region. There was also a need for forums that enable dialogue between tourism companies and culture organisations.

At the moment, there are many different projects going on in Eastern Uusimaa, and many of them compete for the entrepreneurs' time and energy. Synergy and dialogue are needed between these different development projects.

Helia's role in tourism research could focus on processing and gathering existing information and arranging forums where this information would be easily available for tourism companies and organizations in the region.

The themes that arose from the interviews formed the basis for planning and executing the Learning network seminar that will be inspected in the follow.

<u>The learning network seminar</u>

The Learning network seminar was arranged 22.11.2004. The content of the seminar as well as its working methods were based on themes that arose from the 15 interviews of tourism entrepreneurs and actors. The purpose of the seminar was to bring ideas of working methods and concrete development plans under a deeper discussion. The discussion would serve as raw material for the plans of the second stage of the learning network.

The learning network seminar was an important result of the work of two months and it can be considered as one of the most important learning forums during the gathering stage of

the project. 37 persons in all attended the seminar and 15 of them represented entrepreneurs or other organizations in the tourism branch.

The aim of the seminar was to process further the ideas that had emerged from the interviews. The themes were discussed in six workshops that were:

Research serving enterprises in the tourism branch
Innovative product development
Quality development
Development of winter tourism
Sustainable development
Dialogue and networking.

The students of Porvoo – Borgå Unit of Helia participated the workshops and documented the workshop discussions.

Research serving enterprises in the tourism branch

All interviewees mentioned the need for research data that would serve the needs of tourism branch. Companies and organizations expressed need for information on markets and customers in order to be able to develop business operations. Research and development could support to innovate products and help to find new target groups. Further more, a need for a deep cultural research data was recognized.

Research and development were considered the corner stone of the whole project. Research could be conducted in several levels. Companies expressed their need for statistics and profile studies, that is, market information. The network would need information on tourism companies: what are the companies and what are the existing networks and projects in this Eastern Uusimaa region. The discussions also revealed that a lot of research has already been conducted, but the exact information on the findings is difficult to find.

In a learning network project, this kind of market research cannot be the only target. In this learning network project, other important research targets are related, firstly, to the process of building the network, modelling that process and learning about it, and secondly, understanding better the region Eastern Uusimaa and regional identity for the basis of development work.

Quality development

In discussions of the seminar, also the question of the quality of products and operations in the tourism business enterprises came up, especially concerning quality certificates. Actually, quality started to become one of the key issues in the seminar. The Finnish Tourist Board (MEK) has announced that only those companies, who have participated in their quality

improvement process (called Quality 1000), can benefit from MEK's marketing and other services in the future.

Quality can also been viewed from the point of creating quality products e.g. in a form of deeper culture products. When quality is defined and conceptualised it becomes a concrete matter. In a long run, it can also improve work-related well-being, when people can focus their resources better. Hence, it is related also to the theme of sustainable productivity growth that has wide applicability at Finnish workplaces (see Alasoini 2004).

Developing Winter Tourism

Porvoo is a well-known tourism destination with sufficient number of customers in summer season. During the winter season, many entrepreneurs suffer from the lack of customers. Porvoo is not a winter destination even though there are many products available. The development of winter tourism should start from an assessment of situation analysis in order to find out the supply-demand situation. The development work for winter tourism should base on the market research and research of region Eastern Uusimaa. The research was regarded as a basis to this development work. Winter tourism could also be developed as a case project, which means documenting, modelling and linking the case to innovation research.

Innovative product development

Predicting the changes in the travel market and developing new product ideas were considered very important as well. Most of all, the tourism enterprises need help in developing ideas and new products. From the research and development point of view, innovation processes in the learning network could be studied and new innovative abilities could possibly be developed. Research on cultural and regional identity can prepare ground for innovation as well.

Sustainable development

Sustainable development is a theme that should be part of all development work. In the learning network seminar, the discussion around this theme focused mainly on equal tourism. In the learning network, sustainable development will be considered as a broader concept. It is a part of work-related well-being, local food and the social sustainability of the region. It is also a part of the changing role of a teacher. How do the changes in teachers' work affect on their work-related well-being? How does the learning network challenge Helia's current ways of activity? Making the obstacles visible through research was seen important.

The discussion on themes of sustainable development was the most difficult one of the workshops and it remained superficial in the conclusion discussion. However, the shared opinion was that this theme is worth of remembering in the future. In the expert team the

conclusion was drawn that sustainable development is not a theme of its own but will be included in the other themes.

Dialogue

Dialogue is seen the basic tool in the learning network that is purposed to be multi-voiced and essential across all the areas. Creating possibilities for different voices to make themselves heard in the learning forums has been one of the most essential ideas in the project from the very beginning.

Based on the interviews, also, dialogue seemed a contradictory topic in the region of Eastern Uusimaa. The need for dialogue is different depending on the background of the entrepreneur. Thereas old enterprises regard it sufficient, new ones reported it to be insufficient and them being out of the dialogue. Thus, the need for dialogue depends on the background. As the companies are small and entrepreneur driven, dialogue plays an important role.

Results of the planning stage and ideas for the future

The most important concrete results of the gathering stage were the learning network seminar on 22nd November 2004 and the development plan for the second stage (1.2.2005 – 31.7.2006) as well as a preliminary plan for the third stage (1.8.2006 – 31.1.2008).

Already the planning and writing processes can be seen as signs of a new companionship between Helia Business Polytechnic, Helsinki School of Economics, and on the other hand, between the higher education institutions and actors in the tourism field.

A significant result of the planning period is also the closer and persistent cooperation partnership with the Regional Council of Itä-Uusimaa that is a central actor in tourism development in Eastern Uusimaa. The cooperation between higher education institutions and the Regional Council of Eastern Uusimaa has become very close when planning the future of the learning network. The entire expert team has actively participated in creating, writing and commenting the plan of the second stage of the learning network, which can be seen as a sign of a partnership. As a sign of a new partnership can be seen also that nine tourism companies have already committed themselves to the second stage of the learning network and the development projects during it.

When understood learning in the network also as new modes of cooperation and practices, it is worth to mention that there has arisen an idea in Regional Council of Eastern Uusimaa of updating the regional Tourism Strategy without using external consultant firms but doing it in cooperation with Learning Network and tourism companies, instead.

The second stage of the learning network will focus on making the challenges of research and development work visible in the region, as well as constructing methodological tools for

development work. The project for building so called “virtual knowledge platform” has already started. The planning stage of the quality improvement project has also started.

In the third stage of the project, it is essential to development further these tools in order to make them applicable for the usage of enterprisers and actors in tourism business, as well as to establish a new way of activity among actors and experts in tourism business. On the third stage of the project, the development work will continue with the themes initialised in the second stage, and new potential development challenges that will be grasped. The development of winter tourism and innovations will take place entirely in the third stage of the project.

The essential viewpoint on the background of the development work of the learning network will be that the learning network aims at the creation of new knowledge and expertise on sustainable productivity growth, which has wide applicability at Finnish workplaces.

Learning forums as tools for expansive learning process

The activity theory and especially the concept of a zone of a proximal development (ZPD) and the model of expansive learning seem to give a fruitful theoretical and methodological framework for the paper. Based on the preliminary analysis of the data, the hypothesis is that in the different forums mentioned above there is an on-going process of perceiving a ZPD on a regional level. Some very inspiring questions seem to arise for a closer examination. What is Eastern Uusimaa as a region, and, how is it perceived and presented in common discussions on different forums? The paper will be an experiment for using the concept of ZPD on the regional level. This framework could also give a possibility to inspect the concept of region and regional identity both as a tool for perceiving and constructing ZPD on regional level and as an object of this process.

In the Activity Theory the idea of a collective ZPD is related to the model of expansive learning (Engeström, 1987). Expansive learning can primarily be understood as a process of expanding the object and the motive. The object of expansive learning comprises the whole activity system, and in our case, the whole learning network. The expansive learning process can be seen as a collective and long-term process, not progressing linearly but in a cyclic way. (Engeström, 1987; 2000b). In the gathering stage of the learning network, the question was about an endeavour to perceive, what the learning network would/could be, and, what the object or objects of the learning network could be.

An expansive learning cycle represents an ideal type of learning that is a theoretical reduction. In real-life activity, there may be many different kinds of learning and development processes going on, both individual and collective, or processes related to some restricted part of an activity or of a process. It is important to understand how the various learning processes construct each other, what kind of interaction takes place between them, and how they construct the whole learning cycle. (See e.g. Gherardi 1999 and 2001; Gherardi et al., 1998)

Expansive learning can also be understood as constructing a collective zone of proximal development. This can be seen "as a grey area between actions embedded in the current activity with its historical roots and contradictions, the foreseeable activity in which the contradictions are expansively resolved, and the foreseeable activity in which the contradictions have led to contraction and destruction of opportunities" (Engeström 2000a, p. 10). The idea of a collective zone of proximal development is based on Vygotsky's (1978, p. 86) concept of a zone of proximal development.

In the learning network, there was a question about finding out the needs and expectations of tourism companies through the interviews inspected earlier and about bringing these findings into multi-voiced discussion in the other learning forums, as material for possible object of the learning network. Progressing on the way of ZPD and the process of expansive learning there is also question about making choices, in which process the other learning forums besides the interviews had an essential role. From the perspective of expansive learning, the challenge for the learning network is to find out essential tensions and contradiction that could form the basis for development work and target to address.

In this learning network, we found very crucial the idea that each of these learning forums has an important role in perceiving the regional zone of ZPD and the vision of the learning network in the future. So, the vision for the learning network was constructed in the work team as well as in the expert team.

In the process of constructing this regional learning network there seems to be a challenge of great importance for perceiving and conceptualizing the region and the regional identity, too. In the beginning of the project, the region of Eastern Uusimaa was taken somehow too much as given. How the region and regional identity will be conceptualized in the common dialogue in different forums will be an inspiring research question during the second stage of the learning network.

These concepts of region and regional identity have arisen from the discussions on different learning forums described in chapter 4.2., but especially in the common seminar on the 22nd November 2004. In the discussions Eastern Uusimaa was not perceived as a region with a clear identity or a profile. Yet a clear regional identity or at least a clear profile was considered important. In the tourism business regions compete with each other, so it is crucial that a region can be distinguished from other regions. Fragility of the regional identity of Eastern Uusimaa or ambiguity of it is somehow paradoxical, because the region has strong historical roots.

In the discussions of the work team and expert teams also a stimulating concept of "learning region" turned up. A learning region can be identified with following characteristics: identity and authenticity based; a common vision; horizontally and vertically networked actors; developed information and evaluation systems; development strategies. In the paper, we will try to conceptualize this quite loose concept as a tool of learning network activity and as an object of this activity. A learning region can be regarded as a metaphor but it can also be understood also as an ideal of regional development; a striven state of a region

that continuously develops its practices and social capital. Later, in the project, it will be possible to study, how a learning region and regional identity will be constructed in research and developmental practices.

Regional identity as an object of learning network

The preliminary assumption was that regional identity has an important role in the regional development. It is, according to its simplest interpretation, a combination of three elements: history, economic or business life, and geography (Salovaara-Moring 2004). Regional or local landmarks, architecture, dishes and accents are details in a regional identity (Building Design 2005, 4). In Finland, even regional co-operative associations and their local stores have a role in maintaining regional and local identities (Neilimo 2004.) Very often, our worldview is based on a local or regional identity that rises through our upbringing, education and experiences. These three elements in their part are based on our mother tongue, culture and history. (Stubb 2002.)

One way in which identity is connected to a particular place or region is by a feeling that a person belongs to that place. It's a place in which a person feels comfortable, or being at home. A reason for this is that how this person defines him or her self is partly symbolized by certain qualities of that place. (Rose 2000, 89.) On the other hand, it is a question of identification, a tool to organize a person's life (Luckmann 1983, 71).

In short, regional identity is based on a changeable amalgam of individual and group loyalty and empathy for a region. It has a strong geographical expression through a sense of place and belonging with a base on culture, language and history. Regional identity can relate to the behaviour of inhabitants e.g. in their membership of regional associations and networks, which can be linked to the existence of and adherence to civic and professional norms and development of regional social and organisational norms and the development of regional social and organisational capital in the broader sense.

The history of Eastern Uusimaa as a province is very short. The borders of the province are not based on natural geographical or historical things but instead on the decision of the Finnish Government to organize the local administration in a new way. Even if the province in an administrative sense is new, Porvoo as a central town of the province is the second oldest town in Finland and has rich cultural historical roots. Perhaps, therefore there are different ideas even of how to name the region in the context of tourism business. Often the question has also been expressed, whether it would be a better idea to name and to market the region as for instance "Porvoo District" than "Eastern Uusimaa".

On different learning forums, when trying to grasp what the learning network would be in the future and when using the idea of regional ZPD as a tool for discussion, talk about region and regional identity arose. Somehow, the concepts of region and regional identity seem to be contradictory in the discussions. On the one hand, there seems to be a need for a common

discussion on these themes in the region. On the other hand, some representatives of tourism companies question the relevance of regional identity to tourism business.

A same sort of tension was also noted earlier related to regional image, when the Tourism Strategy of Eastern Uusimaa for years 2001 – 2006 was generated. It was agreed that there was not any coherent regional image in Eastern Uusimaa. The opinions about the need for the coherent image were contradictory. On the one hand, the entrepreneurs expressed their need for the coherent image and one source that would market the whole region. On the other hand, the need for a coherent image was questioned (Posintra 2002).

Nevertheless, the region and regional identity were matters that were captured in the different discussion forums of the learning network. In a long run, it would be interesting to analyze, whose voice would be listened, in what context that would happen, and, what that listening would mean in the context of regional development.

In the seminar, held on the 22nd November 2004, the questions of region and regional identity were raised by participants especially when discussing marketing the region as a tourism region at the winter season. It was agreed that marketing and innovative product development should be based on more profound knowledge of the region and regional identity. Also, the question of authenticity was picked up in the discussions.

In the following chapters, we will inspect some questions that have arisen from the preliminary analysis of the data. In this stage, quite soon after the collecting stage of the learning network, there seems to be more questions picked up than ready-made answers to the questions. In the future it will be important to conceptualize the findings theoretically, also.

What on the earth is the region of Eastern Uusimaa – difficult to perceive?

It is difficult to see Eastern Uusimaa as a whole. It seems that its meaningfulness as coherent or united region should be analysed at different levels in the learning network. From the perspective of tourism, the province seems to be scattered in small pieces.

> *What on the earth is this Eastern Uusimaa? What is this region when pointing out tourism? How is it defined? And who does define it? Does it cover from Helsinki to St. Petersburg or Sipoo (neighboring commune)? Those mean just different things ... (Researcher, Helsinki School of Economics)*
>
> *I haven't got a very distinct general view on Eastern Uusimaa after I have moved here. Instead, Eastern Uusimaa seems to divide into the archipelago, culture and countryside. Why is Eastern Uusimaa divided into three parts? Could it not be all of these? (Principal lecturer, Helia)*
>
> *That's true. You can see it also in the projects of tourism. (Project manager, Regional development program)*
>
> (Seminar 22nd November 2004, Research and development workshop)

> *What the earth Eastern Uusimaa? When I was yesterday walking around the old Porvoo, I thought that Porvoo is unique. (Principal lecturer, Helia, Seminar 22nd November 2004, Summary discussion)*

7.2. Is Eastern Uusimaa a unique attraction or a part of a journey?

The question can be raised what the province is like as a tourism attraction. Is it an attraction on its own right or is it only one step in the way somewhere else? Which bigger tourist destination could it be connected with?

> *Is Eastern Uusimaa only a part of the highway?* (Project manager, Regional Development Program)
>
> *Or is it an essential part of Turku – Porvoo – Savonlinna –wholeness?* (Researcher, Helsinki School of Economics)
>
> *And for whom does Eastern Uusimaa exist?... Is this region too near of Helsinki? Is it worth for stopping here when going to Helsinki or coming from there? That's an interesting question.* (Principal lecturer, Helia)
>
> (Seminar 22nd November 2004, Research and development workshop)

> *How could we get money to Eastern Uusimaa from people's pocket travelling between St. Petersburg to Helsinki?* (Entrepreneur N1, Seminar 22nd November 2004, Summary discussion)

> *St. Petersburg is really closed and it is the second biggest tourist attraction in terms of city tourism in Europe. Our talk is very Helsinki-centered in Eastern Uusimaa.* (Entrepreneur N2, Seminar 22nd November 2004, Summary discussion)

Authenticity of the regional identity – or cloning Lappland?

On the one hand, Eastern Uusimaa was compared with Lappland in the discussions. On the other hand, a serious demand for the authenticity of the regional identity was acknowledged.

> *Eastern Uusimaa is also quite a small region compared with Lappland for example … Anyway, Levi –fell and Ruka –fell have constructed successful brands and products and they are same-sized as Eastern Uusimaa as a sphere of influence… It would be important to make the image and objectives of the region coherent. Also, some companies are needed as crowd-pullers, like in the Lappland.* (Principal lecturer, Seminar 22nd November 2004, Research and development workshop)

> *We have to base on the elements we really have here. We can´t clone Lappland. We have to think what is the identity, image or brandy of Eastern Uusimaa. The idea of authenticity is very essential. The innovative product development should be based on authenticity.* (Lecturer, Helia, Seminar 22nd November 2004, Summary discussion).

From what perspective are we inspecting the identity?

> *It is quite interesting that cultural identity for example … Porvoo has a strong cultural identity and all the province is regarded as a cultural province. For example, Pori (other city) is not in any significant cultural place, but when comes to Pori Jazz Festival and*

comparing with what we have to offer in our province…Okay, we have Avanti! (classical music festival) and something… It's exiting that we have much stronger cultural image than what we really are in action. (Regional designer, The Regional Council of Eastern Uusimaa, The meeting of expert team, 15th December 2004)

8. Conclusion and ideas for future research

In this paper, the gathering stage of the learning network has been considered as a process of constructing possibilities for learning. In the end, the paper was focused on perceiving the region and regional identity as an object of the learning network. The discussion on the regional identity has been analysed as an example of a discussion purported being multi-voiced, targeted at shaping conceptions of the region and the regional identity, as well as purported to make tensions and contradictions visible.

The regional identity is not perceived in the paper as a kind of object of the learning network that could be developed in a short time. Instead, the development of regional identity is understood as a stepwise, long-term process. The role of the learning network is to make more visible, how the region and regional identity are understood and conceptualized in the discussion forums. The preliminary hypothesis is that these conceptualizations contain essential and contradictory elements related to the regional ZPD. ´The learning region` can be conceptualized as a region that becomes more conscious about its regional characteristics, and contradictions within, which provides a basis for regional development work. In the learning network, making tensions shared and visible was taken as a challenge.

Perceiving the learning network as progressing at the regional ZPD enables that the construction of learning network can be analysed as a process of recognizing tensions on the region. The object of the learning network can be seen as evolving through the multi-voiced discussion. The ZPD as the theoretical-methodological framework has supported the idea that progress takes place through such multi-voiced, tensed discussions. The research and development work of our learning network has an important role in finding out and making visible the developmental tensions and contradictions related the tourism business in the region of Eastern Uusimaa. As a consequence, it will be important that research and development work are progressing hand in hand in close dialogue. In future, it will be necessary not only to carry out development actions but also to conceptualize the phenomena we are working with. The research related region and regional identity will be one of the main themes in the second and third stage of the learning network.

During the gathering stage, promoting open dialogue among actors and projects in tourism has proved to be one of the essential challenges in the area. As a matter of fact, enhancing multi-voicedness has been one of the main goals of the learning network for tourism business in Eastern Uusimaa. In the future, it will be important to study the dialogue through the methods of discourse analysis carefully. It will be essential to understand, whose voices will actually be heard, and how we can support the learning forums to grow more dialogical. Studying and developing the learning forums will be the core task for the learning network.

The region and regional identity were matters that were captured in the different forums of learning network. In a long run, it would be interesting to analyze, whose voice would be listened, in what context that would happen, and, what would that listening mean for the regional development. In this stage, after the preliminary analysis of the data, there seems to be more questions picked up for future study than ready-made answers to the questions. It will be of interest to analyze future efforts on how the region will be identified through discussions, and what forms discussions may actually take. It is important to find out how the shared process of perceiving and conceptualizing the region and its identity does contribute to constructing Eastern-Uusimaa as a learning region.

A learning region can be regarded as a metaphor but it can be understood also as an ideal of regional development; a striven state of a region that continuously develops its practices and social capital. Later, in the project, it will be possible to study, how a learning region and a regional identity will be constructed in research and development practices.

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Endnotes

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Multivoicedness in organisational identity construction
Knowledge creation as the alignment of interests

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Introduction

This research links the passion for knowledge creation to task solving in temporary organizations; that is in projects. Both organizations under study here are created to solve a specific task. They are temporal, aimed to last the time required for solving their task. It is assumed by the project itself that external stakeholders hold the power to terminate these projects. Their existence is also threatened by the competing interests of stakeholders. Thus the organizations must continuously work to renew and maintain themselves. They do so by engaging in relational work which takes the form of translation of content, such as activities and products. The translation of content is a process where knowledge is created through interaction. By this knowledge creation, the organizations align with the voices of heterogeneous stakeholders in their further pattern of actions, and this becomes part of the basis for content translation. Through such continuous translation and thereby knowledge creation, the organizations take on a new identity, where the multivoicedness is incorporated. We assert that the organizational identities are negotiated as the organizations observe their own actions (Weick 1979).

Through empirical samples we study how these translation processes occur and how knowledge is created. More over we point to how this translation aimed at maintenance also makes the organizations reconstruct their identity. By applying the anti-essentialist way of thinking presented in Actor-network theory (ANT) to the study of knowledge creation, we hope to produce a fresh input to the connection between knowledge creation and identity formation.

Projects

Within contemporary writings of project management the discussion of whether projects are best understood as given units or as social constructs of form, is central. Traditional project theory considers projects as units with specific goals and a certain time frame. Projects are established to solve a task that is quite unique compared to the daily operation in an organization (Pinto et al. 1995, Kerzner 1997, Meredith and Mantel 2000). Projects are said to contain work processes characterised by planned, rational and object-oriented activities that progresses linearly. They usually have a specific mandate, and its authority is not expected to exceed the borders of this mandate. It is an action unit, not a decision unit (Lundin and Söderholm 1995).

Assuming identity creation as relationally determined

We assume that "collective developments occur when people reinterpret their environment through their actions, rebuild their activities and reconceive of themselves" (Blackler et al. 2000:297), and emphasize that rules and regulations of collective actions are socio-historically developed (Engeström 1987/1999/2000). We present this collective development of projects from 'just a mandate' to becoming an action unit with identity. More over, we look for the organizational knowledge creation and learning in these collective developments. Organisational learning might be regarded as the acquiring, sustaining, and changing, trough collective actions, of the meanings embedded in the organisation's cultural artefacts" (Cook and Yanow 1993:384)

ANT is not a learning theory and therefore not an obvious choice for looking at knowledge creation. One applicable framework is the analytical framework of Nonaka and Takeuchi (1995). Their presumption of collective learning as a tension-free process (Engeström 1987) did, however, not fit our observations. Situated learning theories, such as activity theories, embrace tension of learning and knowledge creation. The predefined ideas of actor and artefact, and the presumption of humans as the only actors, were, however, incompatible with our observations. Thus, we apply ANT due to its' anti essentialist thinking where technology and tools are not pre-destined to hold only the position of being an artefact. Rather technology or systems can become actors in themselves.

A salient presumption of this paper is that all things – including organizational identity – are produced, maintained and changed in relations. This identity formation is a sense making process where the patterns of interaction determine its outcome (Weick 1976/1995). Therefore, identity is regarded as fluid and continuously in 'the becoming', rather considered predefined (Callon and Latour 1981).

We find ANT to be suitable for understanding this unfolding sense making process. ANT is a methodology for observing and analysing texts, actions and the factors that influence actions. Being based in anti-essentialist thinking, this framework rejects that anything has inherent qualities, and proclaims that everything is constructed simultaneously through actions, in which their identities are defined relationally through negotiation and action (Latour 1998). The basic considerations of ANT are *how* elements are stabilized and how they change in relation to other elements. Hence, characteristics of an actor, such as size, 'psychological make-up', etc. are co-constructed over time through actions (Callon 2004). The processes where *human and non-human actors* are tied together and become a stabilised system to appear as a unit are under study here (Latour 1992). The process of "tying together" implies *translation* – or reinterpretation – of content. The content is presented in different ways to make others accept it – and become allies. An organization can stabilize its identity by aligning heterogeneous actors in a network (Callon and Latour 1981, Latour 1986).

Translation and knowledge creation

The perspective of "communities of practice" is rooted in social learning theory. In a work context, the communities of practice are communication channels and fields for interaction. Communities of practice are "significant repositories for the development, maintenance, and reproduction of knowledge" (Seely Brown and Duguid 2001). People continuously reconstitute their knowing over time and they modify it as they change their practices. Improvisation in practice is a powerful means of increasing organizational innovation, learning and change.

Knowledge is created through collective reflection. In this context, knowledge creation does not only point to the big inventions. Most knowledge creation is incremental, takes a long time and includes long processes. In the cases under study here collective reflections take place for example during process mapping, problem solving and decision making. This interaction reflects the stakeholders' interests and demands, which become part of the knowledge creation and part of the identity formation (Wenger 1998). This is alignment. When the project groups meet new and problematic situations, either in choosing trajectories or in sense making, identities are shaped through this confrontation with the unfamiliar (Wenger 1998). This means that knowledge creation is influenced by the adjustment to stakeholder interests, and these translation- and alignment processes develop and change the identity of the organization.

Empirical inquiry

Our main aim in the present study has been to combine two complementary theoretical frameworks in an analysis of two single case studies. It is not a comparative case study. These cases are sampled from very different contexts, and this may serve the purpose of using the same theoretical framework on two contexts and two sets of actors with presumably fundamentally different epistemological basis. In the first case the context is from the engineering field, which is situated in the quantitative field with emphasis on exact and certain knowledge, and actors socialized in a rational and scientific environment. In project work they are forced to use a different knowledge basis in how they align with their stakeholders. They adjust their message according to which stakeholder it is given to. For the second case it is the other way around. The context is a hospital, and the majority of the actors are nurses. There is reason to believe that they have a different view of knowledge, being familiar with and having meta knowledge on tacit knowledge, intuition and creating knowledge in situated interactions. When they meet the balanced score system, different knowledge views meet, since this system is quantitative and rest on a different knowledge perception.

This study is closely linked to the interpretative approach (Lincoln and Guba 1985). It is designed to be qualitative, both in the way data are constructed and the way they are analysed. Inspired by ethnography, the research is longitudinal and explorative (Hammersly and Atkinson

1993). The aim is deeper *understanding* of the concepts and phenomena under study. The tools used for data construction are systematic observation and semi-structured interviews (Kvale 1995, Kvale 1996). The aim for further development of this paper will be concept- and theory development.

Empirical presentation

Case one

The second project we study is the GSM-R project, where the task is to build an emergency communication system for railroad, combining advanced technology development with railway construction work. GSM-R is the acronym of Global System of Mobile Communication for Railway. It is one of the largest contemporary projects in Norway, holding a budget of 200 000 000 US dollars and a duration of five years (2002-2007). The core project team consists of more than 50 people. There are two major sub-contractors. When The Railway Inspectorate signed an EU agreement the milestones for the implementation of the system were established. If they failed to reach these milestones, they would no longer be allowed to operate. During the three years of operation, the project has continuously been questioned. Additional problems exist in funding, since money was only granted for part for the railway line at the start of the project. Further funding through the national budget in 2005 left in the open. This funding was necessary in order to continue the construction of the planned Phase 2. Our data shows how the project work hard to position itself – step by step – to influence this decision. This was for example done by getting central actors to speak on their behalf, and by actively contribute to the discourse of safety. Money was granted for Phase 2 constructions, and the first line of this second construction phase opened in the beginning of May 2005.

Our data shows that the GSM-R project develops competence in technical matters *and* in handling its' stakeholders. Through this gradually evolving interwoven competence it comes to be not only the task solving action unit it was established to be. It becomes a powerful actor that decides for itself and in many ways influence the decisions of others. It manages to extend its zone of operation. It takes on authority, exceeding the level of influence it was originally granted by its initiators, and makes itself indispensable in the discourse of emergency communication system. Thus we claim that this project by acting and observing its own action, takes on a new identity. To show how the project manages to do so, we look into central characteristics of the project at four different periods in time, here constructed as epochs. Across these epochs (E1-E4) we study variations in the project activity considering central elements such as task, competence, the relational work and the work with decisions. This is summarised in table 1, shown in the appendix.

Task. Starting up, the task is regarded as specified and straight forward (E1). As the project works to solve the task it increases in complexity, it appears as complicated and ambiguous (E2). This is solved through exploration and trial and error. The task goes from being characterised as *clear but demanding time wise,* to be regarded as innovative, pioneering and adventurous (E3). The technical solution starts to live *a life of its own* infused with troubles.

Competence. As a result of the presumption about the character of the task, a high performance team was established (E1). As the complexity of the task is revealed, competence is built through trial and error. The project characterizes its development as 'a steep learning curve' (E2, E3). There is no emphasis on relational competence from the initiators and owners of the project. The project team expresses quite early in the project that relational competence is revealed as important. Acknowledging this, the project starts exploring how to act in relation to other actors through trying out different alternatives and reflecting on the effects. In epoch 2, there is extensive relational activity, much due to major problems to meet the deadline, and thus facing a real threat of being terminated. The project team gradually develops efficiency in relational work (E3). The acquired learning on technological development and relational work is gradually embedded in routines (E3, E4).

Relations. Normatively speaking, projects are not supposed to work to influence external relations. From the start the project under study had no guidelines for such work (E1). It started out by identifying stakeholders and establishing a distant relationship with the project owner, assuming the owner would provide them *action space*. As the project manager says "In order to get things done, we had to get them (the owner representatives and the other stakeholders) at arm's length"(April 04). In E2 relational work is emphasised and become more efficient. Due to tight deadlines from the beginning and problems with the technical solution the project needs to pressure the actors in the desired direction. The following observations from a leader team meeting (March 04) illustrate how it works. At this meeting different participants of the leader team report on progress and on problems for the specific core processes they are in charge of, and these are discussed.

Pm: "Does the inspectorate mean anything about this?"
E."Not really"
PM:"What strategy have we made to make sure that this decision is made the way we want it and on time? Who owns this process at HK? And to whom do they report?"
E.:"The project (themselves) have asked HK to come up with X. So it is actually we who play this part. We define the premises here – and kind of just inform them"
Pm: "So we are at the lead here – making the decisions?!"
Jp:"Hm, good this is about cost and progress?"

Pm:"Yes. – – So, this is a critical week for us! We need to communicate that to everybody!".

Gradually, in E2, the project establishes routines which help influence the decisions of others. It engages in dialogues with its stakeholders, emphasising that due to its' great competence on this quite unique task – it should be allowed to contribute in the decision making processes. In these dialogues it describes its own task as well as the processes it activates to solve the task. The task- and problem-solving processes are claimed to be unique compared to the other activities of JBV, but also unique compared to other tele-communication projects. Through this work the project gets to provide the information required, to map different alternatives and to suggest 'the best solution' in numerous decision making processes related to the GSM-R. In these interactions with certain actors, such as the project owner, a practice gradually seems to establish itself at the end of the second epoch where the project, without fighting for it in each case, gets the role of information- and decision supplier. Routines of contact between the project and other stakeholders who make decisions seem to unfold. These are in the form of regular meetings, where the project team is asked their opinion in matters where the premise providers assume that they hold an opinion. Finally, an interaction pattern develops where the project informs 'just informally' about matters they consider important for their task solving process. Here the project also gets a chance to ask for clarifications due to the need 'to get on' with its task solving.

"(...) Often, it is the case that one needs a clarification, then the project does not possess the mandate to take this decision. Then the staffs holding this mandate do neither have the competence nor the resources – or the head where it should be. So they cannot make it either. But then we can't make the decision ourselves, so then we have to make sure that we have the right persons involved so they can make this decision and that the decision they make is ours – so that we can live with it. That's what often happens, we have to make sure that those providing the premises make decisions at the right time and that they make the right decisions".

The following quote from a leader team meeting (August 04) may indicate that the project has turned into an institution with quite some influence in E3. This is part of a discussion on whether money for phase 2 will be granted or not. The project manager says he has positive signals about it. He says "We work with the big bosses" referring to a certain person that used to be related to JBV before, and is now centrally located at the political scene. "He is creative when it comes to raising money in alternative ways". The Project manager goes on (August 04):

"We are not supposed to know anything about this. And we are not going to talk about this – but you guys have been around for such a long time that you understand. However, we obviously know too much about this and therefore I was called into a meeting at HK today. The message I got was that about this issue the project does not officially mean anything – until we are asked!"

Mechanisms for working with relations

As indicated above, the project works with relations, through purposefully talking about the project, its contribution and importance. It specifies what it needs in order to work efficiently, and what it thinks would be 'the better' or 'the only possible solution'. In this relational work they are very conscious about *what* they say and to whom – in order to get them to play along. When they fell behind schedule for the first milestone and needed the inspectorate to prolong the dispensation for train operation without GSM-R, the discourse on safety was played out and used consciously. As the project manager says (April 04.)

> *"We focused on how it had not been foreseen the difficulties of testing the system in use. We focused on how safety would be reduced and that safety must be the number one priority. The Inspectorate bought in to this and the dispensation was prolonged to 01.01.04."*

When they are not able to deliver at the next milestone it is dramatic. Having 'staged a western show to assure that it was completed four months earlier, this was a troublesome situation'(PM 15.04.04). The project team's existence has from the start been questioned and this milestone is set at the same time as the national budgeting process of Phase 2 is conducted. The project needs to cover up the delay and keep up the production to reduce the delay to a minimum. For this purpose they translate the fact that it is delayed into stories. We identify how five stories are told simultaneously, and the effect seems to be that the other actors to act in the desired direction. These stories are slightly different depending on the stakeholder it is directed to, even avoiding the embarrassment of being revealed since the stakeholders are interrelated independent of contact with the project team.

The last example of translation to be mentioned here is the milestone autumn 2004. The project has not yet obtained control over the technical solution. They by-pass this problem by removing "functionality" from the delivery specifications, and instead constructing "functionality" as a new milestone labelled *the functional phase*. It is argued that such a step-wise development would increase safety. Through such translations of the project and its' deliveries, the GSM-R project manages to reproduce itself gradually taking on the identity of an indispensable actor in the GSM-R discourse.

Case two

The second case is from a hospital in Southern Norway. During a six month period the project team under study worked on a pilot project aiming to introduce a balanced control system, or balanced score card system. The pilot project consisted of process mapping, development of measure indicators and implementation of some minor measurement projects in the maternity and gynaecology ward. 815 women gave birth at this hospital in 2004.

The hospital as a whole is going through a process of organizational change with a Business Process Re-engineering approach called Patient-focused-Redesign. ”The central tenet of BPR is that organizing business activities around processes rather than functions will generate major improvements in operational effectiveness, customer satisfaction and cost reduction, and so will enhance competitive advantage” (Newell et al. 2000:240). The patient focus means that they are trying to focus the medical staff around the patient and the main treatment processes, and not vice versa. The purpose is to decrease waiting time and inconvenience for the patient, in order to increase staff cooperation and to increase efficiency in general.

The mandate of the pilot project in the maternity ward was “to consider and clarify the possibility for implementing a system for scorecards based on registration of events in the medical treatment processes, selected measurement indicators for quality, and registration of economic data in accordance with the core treatment processes in the hospital” and “The project team is asked to consider the possibility of using the data in a system for economical analysis after the principle: cost per patient – CPP.” (Report from a preliminary study to the pilot study). A condition for moving this project from a pilot project to a full sized project, for this ward and later for the whole hospital, is that the scores are linked to the accounting system of the hospital. Due to lack of funding this condition has not yet been fulfilled, and the system is presently “in a drawer”.

The passion for knowledge is easily observed in the ward under study. Employees on all levels in the hierarchy demonstrate eagerness to interact in knowledge sharing and creation. In this project the passion for learning and the professional epistemological platform meet the economic and efficiency demands represented by the balanced score card system. These two systems represent different and sometimes contradicting voices on learning, and when they meet – a translation process takes place Knowledge is created and this has impact on the identity formation.

The project team consists of six midwives, three children’s nurses, two doctors and three supervisors. The supervisors are support staff from other departments, internal to the hospital, external to the ward. The project team acts on order from the top management. The order, or the mandate, is facilitated through the internal consultants. “We are going to try to make the whole house co-ordinated with the emergency ward. So that we know how much a gynaecology patient costs – so that we can have control of the economy” (consultant in her presentation of the system).

There are at least two major learning processes in this pilot study. One is learning the system and accepting the epistemology underpinning the system. “You need to improve your competence in statistics, monitoring, and in choice and development of the right measurement indicators” (consultant).

The terminology used and the epistemological underpinning of the system, which is quantitative and emphasizing the explicit and countable dimension of knowledge, represents a contrast to the apprehension of knowledge and learning in a hospital setting. “That which is not documented has not happened, been said, done or planned” (consultant).

The contradicting knowledge view may be difficult to recognize for the participants, due to the tools used, like for instance process mapping (Newell et al. 2000), but when adopted it shapes identity. Further this must be seen in the context of the strained economy in the organization and the new competitive situation for the hospital. In this new market situation, hospitals and regions compete for the patients, and their funding depends on how successful they are at attracting them. The regional health corporation and the management represent stakeholders here, and the introduction of the system is legitimized through an economic argumentation.

The other learning process is when they apply the system to their practice. They describe their practice through mapping the two main processes on the ward: the “normal” birth and the main gynaecological process. The mapping becomes a description of an *expected* course of the treatment- and care process. The collective reflection and learning process in the discussion is fertile, and often exceeds the mandate. The discussion around the indicator “*incoming telephone calls”,* unveil potentially contradicting goals that the different stakeholders may have in this project. What the staff wants to demonstrate is that they use vey much time on incoming telephone calls, and they want to use this score as a way to document the need for a ward secretary. In a period of bad economy and budget shaving, it is unlikely that a new secretary will be employed.

One of the sub-groups report on a variety of measures, collected from the patients’ medical records. These measurements are met with great enthusiasm, although they predominantly show normality: “We were surprised by how much normality we have” (midwife in one of the sub-groups). The team moves from a rather passive and trying attitude when the project is initiated, to discussions on how to analyze scores in. And there is a quite lively discussion around the possible covariance between the duration of a delivery and to what degree the mother has been stimulated. What these numbers are to be used for is not touched on very much. Obviously they can be used both for and against stimulation. If a delivery takes less time it costs less. But is it also safer?

In the data from observation of the project team meetings, the collective reflection, storytelling and active listening are examples of the translation process. The project members become ambassadors for this system through the learning process they go through in the pilot project. This is necessary in order to “sell” the project to their colleagues, in order make them participate in the measuring and counting performed on the ward.

The minute from the last meeting in the project team (written by the consultant) describes what the project group has learned in this project (i.e. what the consultant interprets): ”The

members in the working groups and in the project team have developed their competence in the form of "having an eye" for what exists of data/possibilities for measuring in the processes. This is also a process, and there are continuously new ideas on what should be measured. The members of the project group have developed their competence on monitoring, and the midwives find some of the measurements that are tried out interesting enough to be presented in their professional journals" (Minute from meeting December 9th 2004, our translation). "Having an eye for" points to intuition and tacit knowledge, which underlies the consultant's analysis here. This intuition and tacit knowledge is used in the score card system.

The system as an actor initiates the interaction which leads to knowledge creation, either in the project group itself through process mapping, or in the process of introducing the score cards to the rest of the staff when the measuring project is initiated. This way constructing this control system means enrolment of other actors. The system is stabilized through the project team's adoption the balance score card system, which represents the stakeholders' ideas.

Tentative analysis

ANT emancipates us from the rational and functional belief embedded in normative project theory, and enables us to keep focus on how projects relate to stakeholders in their context (Latour 2004). The projects develop from actants to actors. They start out as actants, as abstract structures sketched in a mandate. Through their actions they become concrete; they become actors bending space around themselves (Latour 1992, 1998). The projects develop voices of their own and take on changed identities. In order to do this, they need to active listen and incorporate the voices of their stakeholders. ANT states translation as an important mechanism for aligning interests. Our empirical material shows how the projects engage themselves in translation. In case one there are numerous examples of such translations occurring as creation of illusions, stories, re-scaling of the system establishing new phases and labels and framing oneself as an actor with unique competence in mapping alternatives and suggesting a better alternative.

In case two translation processes takes place when they map their core processes and literally translates the system into their own terminology, or when they discuss how to analyze scores and use them to document their needs.

Both of these project teams are communities of practice. The sharing and creation of knowledge that takes place in them is situated and closely connected to the specific tasks. Translation seems, in our cases, to be related to knowledge creation in a recursive manner. This means that knowledge is created in translation, and translation is conducted as knowledge is created. The voices of the stakeholders become incorporated in the knowledge creation and form the basis for further knowledge creation and translation. How knowledge creation is influenced by the mandate for the project, vary in proportion to how well the team sticks to the original

mandate. In case number one the project team exceeds the limits of the mandate through the translation process and the identity changes radically. The identity is marked by the transformation processes and the forming of it is marked by an agenda parallel to that of the stakeholders. In case number two there are some traces of using the scores in manners that contradict the original intention, but this is more open.

Organizations that engage in transitory relationships with their stakeholders, reinvent themselves (Scott and Lane 2000). In this paper we have begun to show how the identities of these organizations are formed as they align with the voices of their stakeholders.

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Appendix 1

	Epoch 1	**Epoch 2**	**Epoch 3**	**Epoch 4**
Task	The technical task is clear, 'just to conduct as stated in the EU spec.' The process of how the project is to be carried out and how and by whom the system should be implemented is in the open	It is great will to solve the task and number of actions undertaken for doing so. It is still perceived as quite clear, but difficult to solve. The technology is infused wit troubles on a life of its' own.	The task is perceived as complex and complicated. It is stated to be challenging involving pioneer work, exploration and innovation.	The technical development and innovation is mostly completed. The task is less complex at this stage and more in the form of being repetitive.
Competence	The participants are specially recruited to solve this task. In regard to presumed core processes required to solve the technical task, the project team is put together to be a high performance	Action alternatives are developed and reflected on. One argues back and forth about 'the better solution'. It is learning by trial and error.	The trial and error competence building is still present. It is less related to the technical development and – more to routines of operation between the actors involved in present and future operation of the GSM-R system	Little competence development required. Competence is embedded in routines, little learning through trial and error is observed.

	team			
Relational work	Sub-contractors are assigned and contracts worked out to regulate the interaction with these and patterns of interaction gradually unfolds. The tone is friendly tough the interactions characterized by testing out the boundaries of responsibility and authority between them. The projects works to get the owners and other stakeholders an arm-length away - to get things done. It tries to gain influence over decisions, but obtains such with various success	The relation with sub-contractor is troublesome. GSM-R tries to involve, to hold back info, apply incentives and to help. The work in phase one to obtain more influence on decisions seems to manifest itself. It emphasizes that due to the uniqueness of the task, the project must be asked about decisions regarding them. Routines unfolds where the project is asked advance, or it gets to inform by small-talking, get to map alternatives and suggest solution or just act and get it accepted in retrospect	The relation with sub-contractor is still troublesome. It applies harder methods to force the sub-contractor in the aimed for direction. It obtains extensive authority placing their people in the org of the sub-contractor, getting the authority to verify the people they employ, getting extensive resources and focus. The influence external stakeholder is manifest, the project is a strong voice in the discourse of GSM-R	Less critical decisions are made. They have been granted the money required, the system is accepted and Less noise, it seems accepted the solution itself and that it has come to exist. The project seems to have established it self as a strong voice in the discourse of GSM-R, influencing decisions about GSM-R. They have gained control over the technology and the sub-contractor and the sub-contractor is given and takes more responsibility

Endnotes

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East is east; and West is west. Some perspectives on facilitating learning at, or across, the boundaries of culture

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Preamble

As with so much research and work in science, technology and management studies, the vast bulk of new work published in the literature on learning within an organisational context is "Western"[2]. Research findings are developed from within 'western' paradigms and embody western ways of thinking, learning and effecting change. Such a domination of the field is not wrong, *per se,* and most people would agree that the rest of the world can often gain from following some of these precepts and creating new learning and knowledge using these western frameworks.

But in another part of the world, other cultures embody their *own* paradigms of education and life-long learning and pursue their own ways of developing human potential. Once again, it is not appropriate for westerners to label this as right nor wrong; it is just ***different***. Each society can happily exist within their own zone of the planet and, within their individual frames of reference, maximise the potential of their own peoples. There is an honourable tradition in many Asian countries of producing excellence in all fields of human endeavour and the educational level of skilled people in these cultures can equal or exceed that of employees in western companies. Articles regularly appear in the popular press bemoaning the fact that "Asians" are performing far better than "Westerners" in standardised tests.[3]

So people in both cultures can happily continue their learning activities, unsuspecting that others may not agree with their methods, unaware of each other's viewpoints perhaps, and progressing non-competitively. The trouble starts for practitioners at the boundaries. Where 'East' meets 'West'; possibly for the first time. To which ideas and frameworks can a practitioner turn to seek guidance in such situations? How can a management trainer maximise their chances of success if they are asked to operate at, or across, cultural boundaries?

This paper explores some of the theoretical structures that an enlightened practitioner might utilise and addresses some concrete situations where boundary management will be critical. It explores some of these issues through the medium of real-life case studies:

- Bringing western methods of working to branches of a state owned bank in mainland China
- The integration of local Thai staff with expatriate staff through training and development in a joint venture oil refinery on the Thai coast
- The introduction of 'modern' adult learning principles into a traditionally-run Bank in Bangladesh

The perspective of the paper is unapologetically that of the reflective practitioner and does not claim to represent academic break-through thinking in the domain of learning theory. It is much more about the application of learning theory in real-world settings which may be far from the contexts in which the theory was developed and tested. The paper shows how the reality of promoting and enabling learning across the boundaries of cultures does, of itself,

produce learning for the practitioner who is prepared to reflect, reconsider and amend their working style. Building on the learning points arising from the cases, some implications for effective interventions are suggested. To reinforce the focus on praxis, some practical *"Hints and Tips*" are given: designed for practitioners working on learning-based assignments across cultural boundaries. Finally, some opportunities for empirical research are suggested.

Western paradigms and learning theories

There is a well-established literature relating to andragogy, the science of adult learning, upon which organisational learning and management development efforts have drawn over the last decades of the 20th and the first years of this Century. Core writers within the canon, for example Warren Bennis, Chris Argyris or Kurt Lewin are well-established and their work may even be reviewed or perhaps critiqued during this conference. The aim of this section is not to provide a comprehensive literature review; that can be left to others in the field: rather, these paragraphs illustrate part of the theoretical base from which an informed practitioner might develop specific, practical, solutions. Whether these solutions will fit other cultural settings still needs to be assessed. The theories of andragogy are well-delineated in Knowles (1980, pp35-72) and Burns (1995, pp225-253). In particular, the work of Malcolm Knowles, although somewhat dated now, remains essentially "true" for this practitioner and this volume is a valuable source of comparative models and ideas. The paradigms of adult learning in the west share a number of distinctive features with which practitioners are familiar: perhaps so familiar that they may no longer have real meaning for them and they are no longer challenged as inherently "correct". For a "western" practitioner who is keen to extend the depth of organisational capabilities through learning and growth of the people in that organisation (developing core capabilities through enhancing individual competencies as it were), some of the familiar concepts that they can draw upon include:

- ***Incrementalism***. Linkages are necessary and desirable for helping adult learners make connections between new ideas and their existing knowledge. Learning theory moved on from the simplicity of the *tabula rasa*, where educators had a smooth and uncluttered mind to work upon, and progressed to accept another reality: of building on top of, and within, complex, self-sustaining networks of knowledge and attitudes into which new knowledge or attitudes had to be fitted.
- ***Challenge and engagement***. Effective learning occurs when the adult can engage in a dialogue with the "teacher" (who of course is more likely today to be called a facilitator or coach) and if the training is delivered in flexible, appropriate ways, Smith (2002). The notion of engaging the learners in the experience is now a tenet of learning design that is ineluctable. In a normal western setting, this is not a problem at all. We design events with this in mind: the students ("learners") expect it, we deliver it and the process proceeds smoothly to its planned outcomes. The problem will be shown to be in

cultures where, rather than being ineluctable, such an approach is simply incomprehensible.

- ***Relativism***: All learning is considered to be contingent and relative. What you understand from a new concept can depend, to a large extent, on your own personal circumstances. An understanding of the learner's existing knowledge and frame of reference is needed to help a trainer develop suitable learning events.
- ***The context of learning.*** In an analogous way, the context of the learning that needs to take place is also important. This paper takes as a focus learning that takes place in a work environment. Such learning is often associated with the introduction of new technologies, new ways of working or as part of organisation transformation efforts. The context of the learning will identify the other factors that have an impact on the learning and which may need to be managed by the practitioner. Klein and Sorra (1996) provide a wider perspective on some determinants of success in implementation: in their case the implementation of "innovation", but the comparison with successful implementation of learning can also be made.

All of this theory has worked well for western companies and generations of students of management have developed within this set of ideas. In particular the idea of relativism, the realisation that your personal circumstances might affect the nature of the ideas to be "learned" has enormous attractions for a society based so strongly on individualism. The value to the reflective practitioner of these various ideas on management learning are clear: as well as being intuitively comforting and comfortable, they provide a coherent and integrated set of concepts and practices that will enable a practitioner to design, pilot, deliver and evaluate learning events, or stimulate the learning of others in their work. It has certainly worked for the author, and has enabled him to engage with learners within a range of organisational contexts and with differing personal situations.

But it can be a chastening experience to find the very basic building blocks of practice challenged or misunderstood by others. An awareness of the differences in cultures and how these differences might influence the design and implementation of learning events is essential and useful background is given by the well-established writers in the field. Hofstede is widely-known and often cited. His work has been influential in enabling managers and practitioners to share a vocabulary for discussing differences in cultures found in organisation from different parts of the world. His four factor model (articulated in Hofstede (1980[1] and 1980[2]) and expanded in later works (1983, 1984) has been a foundation for many attempts to "understand culture". His work has been criticised for the questionnaire methodology used and the sampling design: his technique of using the consistent organisational setting of IBM to uncover differences in working that could be traced to "culture" is elegant, but also flawed as suggested by McSweeney (2002) and Bond (2002). His analysis of the data was also criticised by McSweeney, who postulated that quite different cultural groupings might have emerged if Hofstede had made different decisions on how to deal with the concepts of ***Power-Distance*** and ***Individualism-Collectivism***. Despite these criticisms, his work has remained

influential in understanding the impact of national and ethnic cultures at work. The work of Fons Trompenaars in the early 1990s also put forward a series of bi-polar attributes and his work can be seen as illuminating the issues of culture in the work setting from a different angle. The models described at length in Trompenaars (1993) also enable the practitioner to understand some ways of characterising differences in culture. Neither model, however, necessarily addresses the day-to-day reality of creating learning events that will work effectively in another culture.

East Asian paradigms and learning styles

On another part of this planet, other ideas have been long established and societies have developed other ways of working and learning. In particular, this paper looks at some of the ideas that underpin learning in East Asia[4] and how they might differ from those that might be experienced in the west. For example, a Chinese educator may typically not distinguish between "School learning" and "work learning": any learning in adult life will be achieved using many of the same principles by which the individuals' developing years were shaped. Some of the core concepts around which learning efforts might be designed include:

- ***One-way transmission of knowledge***. The teacher has knowledge and will impart it to the students. The students have the obligation to absorb the lessons. These core assumptions create the drivers for many of the physical and organisational arrangements of Chinese-medium learning: regimentation (to use a western term of disparagement), a class-room / lecture hall environment, a raised dais for the teacher and the pupils making dutiful, careful and scrupulous notes throughout the lesson. Here, the *tabula rasa* approach may still have some adherents; certainly the concept of the empty vessel waiting to be filled by the wisdom from the teacher is alive and well. Such thinking extends to the workplace and influences the design of training events even today. Chan (1999), provides a useful review of the "Chinese Learner" and the implication for western educators
- ***Acceptance and conformity***. Students will conform to the expected patterns of behaviour and they do not expect to challenge or question the information they are being given: nor will they challenge the way that it is being taught. Along with accepting the wisdom of the teacher or trainer, an attitude is fostered amongst Thai schoolchildren of obedience and support of the teacher/father figure. It is just not part of Thai schooling to challenge the viewpoint or to raise uncomfortable alternatives. Later in their life, at work, the same assumptions are, of course, maintained - unless the organisational setting has been internationalised to the extent of allowing 'western' ways of working
- ***Uniformity, cohesion and "absolutism***". A typical way of learning for individuals within an organisation would be to receive the company regulations and a set of instructions. These rules would be standard and absolute for the whole of the country.

Even over such a vast landscape such as mainland China, these regulations would be promulgated from the capital city and distributed to every Province: they would be absolute and unchanging and take no account of local conditions and certainly would not encourage responding to personal preferences. In such a setting the western use of "Bureaucracy" as a term of disparagement, would not be endorsed. It appears to be a legitimate way of running a vast business organisation, but it also extends into the more intimate space of an individual's learning. Receipt by a manager of the Regulations from the Central Bank in Bangladesh, for example, is taken to mean that the new procedure has been learned.

- ***Deference towards those in charge or with power.*** Hofstede's well-known articulation of cultural dimensions included **Power Distance** (Hofstede 1980) and this has a practical ramification in learning settings, since the discussion around a table, even amongst an intact group of senior executives, will be unavoidably influenced (one might even say 'skewed') by the presence of senior figures. The author has witnessed many a situation where, without any verbal contribution, an authority figure has made clear his disagreement with the particular idea or concept being proposed. Expecting an open discussion ("*What do we all think about this idea then*?") without taking appropriate preventative measures is of no value at all.

The reality of working at, or across, the boundaries of cultures

What, then, for a practitioner who is asked to go into such a situation and help create understanding and learning for individuals from another culture? Three case studies are used to illustrate some of the challenges that can be faced and to identify some learning points that emerged for the writer, which can be generalised for a wider context. These illustrations are not intended to showcase leading-edge learning methodologies or educational technology; far from it: the approaches and objectives will be very familiar to any practitioner working in more advanced economies and organisations. Rather, they are used to illustrate some of the difficulties of achieving routine outcomes in an alien setting. The learning is in the ***process*** that was needed rather than in the learning goals themselves.

Case Study 1: Creating management awareness in provincial China

Setting: China Construction Bank in Wuhan and Shenyang

Objectives: A multinational team was conducting a detailed operational review of the structure and operations of provincial branches of this Bank, one of the 'Big 4' State owned banks in the Peoples' Republic of china. The writer was leader of the team responsible for assessment and critique of the Corporate Governance structures and processes, along with more general HR and People matters. Part of the assignment

required us to "sell" our ideas to the management teams in each Province and to gain their support for the recommendations

Challenge. Having completed a detailed Diagnostic, it was necessary to go back to each province and spend time with the management teams developing their understanding and to gain their commitment to the ideas. The meetings that took place revealed the sort of characteristic of the Chinese management teams already alluded to in earlier sections. At the meetings arranged for us to present and convince the management teams, we were greeted by the executives of the Branch sitting in formal splendour, pens at the ready. How could we maximise the likelihood of success in these sessions?

Solutions used: The medium of dialogue had to be Mandarin, although most managers had reasonable English. The approach used was to prepare detailed tables giving an analysis of the issue, examples of best practice and specific recommendations to close the gap. At the meetings, the 'key note speakers' were all foreigners, using English to make the key points and to provide a foundation for the local trainers. These trainers had achieved temporary authority (despite their youth and obvious lack of experience) through association with the prestigious international consulting firm and by close identification with the "International SMEs". Normally, of course, the social fabric of provincial China would not have allowed them to spend as much time in direct face-to-face interaction with senior staff. Prior exposure to the ideas had enabled the Chinese managers to understand the principles under discussion and to appreciate the way in which the recommendations had been developed. The evidence from "Current Best Practice" served to underline the expert status of the consultants. The discussions that took place in the extended meetings were therefore around the practicalities and implementation issues rather than with the underlying reasoning. The discussion took place in a mixture of Mandarin (translated where necessary into English) or English alone. The outcome was acceptance, albeit reluctantly at times, of the new ideas and endorsement of the recommendations. At a certain level, it was possible to say that they had learned about new ways of working.

Learning points: It was fortunate for the practitioners that there was a willingness to listen and to learn from international consultants, which had arisen from the pressure for change within the organisation. What was lacking was an acceptance of the new approaches. The learning necessary for them to agree was achieved, in part through the use of techniques with which they were already familiar: very logical, complete and detailed documentation, this enabled them to make the connection to their current situation. The wisdom and intellectual power of the advisors (a source of deep and sincere respect for the Chinese) was established through liberal use of "international best practices". A willingness on the part of the trainers to let go of the training process through the use of native-speaker colleagues, without the safety net of simultaneous translation, aided the flow of the events, although it significantly increased the ambiguity of the process and stress levels on the monolingual westerners. The ability to manage the fine distinction

between demonstrating expertise and hectoring was a measure of the success of the practitioners in each session.

Case study 2: An oil-refinery merger in rural Thailand

Setting: A new operational alliance between two Western managed refineries

Objectives: To create and implement the organisational and people aspects of the Alliance.

Challenge: A series of intense development, learning and culture-building activities had been designed to support the move towards an integrated workforce and shared ways of working. A typical Thai learning framework might have similar characteristics to that of a Chinese medium environment, with a strong emphasis on the specific location of wisdom and knowledge in the 'teacher' and the learner's obligation to learn from older, wiser, more knowledgeable teachers. A Thai participant on an internal Thai programme would not expect to be asked to give much in the way of his or her own opinion and this made it difficult to run the sort of joint, cross-cultural events that were needed.

Solutions used: In this case the preferred strategy was to move the Thai workforce more towards a Western style of learning and group development. This was not to suggest that this model was inherently superior, but as both Refineries were part of large multinational corporations, training events and learning materials from within their own organisation would, of course, be developed around western concepts and designs. Pre-event coaching was introduced for two distinct populations. Participants from the Thai workforce were coached in what to expect from the *farang* bosses. At one level they knew most of this, naturally enough, having worked there for some time. But the realities of various situations were discussed and alternative behaviours were explored. The most significant issues were around participation and disagreement. When there was a mixed group for a learning event, participation did not happen spontaneously. The Westerners did not leave many gaps in the verbal traffic and the Thais were reluctant to jump into what few gaps emerged. The coaching was to develop some basic behavioural skills around assertion and effective contribution. We had no mandate, nor any desire, to overturn hundreds of years of Thai culture, but it was possible to give them permission to be different and to give them the courage to attempt it. Expressing differences of opinion was also encouraged through the coaching of specific ways of putting across a point of view in a way that was forthright, without being seen as rude or unacceptable by fellow Thais. At the same time, coaching was going on with the *farangs*, to help them deal with the frustrations of the ever-smiling, ever-agreeable, self-effacing, Thai colleagues, from whom no real change or action was ever seen. The expats also learned more of how their own behaviour might be viewed by others. Once again this was 'known' at a certain level but not articulated well enough to influence their behaviours. At the events themselves, there was a judicious mixture of same-culture group working and shared discussion. "Appropriate behaviours" on both sides of

the cultural boundary were praised and rewarded. The outcome was a successful 'merger' of two different corporate cultures involving the multi-national expat management team, the Thai workforce and accompanied by a rapid localisation of management positions once the Operating Alliance was functioning.

Learning points: It became essential to build into every significant event enough time and space for the Thai workers to gain confidence and courage to participate fully. The time-scale for this to occur was frustrating at first, since our designs and time-lines had all been developed with an expectation of far more rapid progress and movement. Allowing significant opportunities for same-language discussions (even around the table as the presentation unfolded), was seen to be an important part of getting a higher level of 'engagement' and participation.

Case Study 3: Modernising management training in Bangladesh

Setting: A large Nationalised Commercial Bank is undergoing a programme of stabilisation and radical reform over the period 2005-2007, to address legacy problems and to become capable of operating in an international environment.

Objectives. A number of very significant changes to the way that the Bank is organised and managed have been recommended. These need to be systematically implemented over the coming years and this implementation will invariably involve a great deal of "Training and Development". Such actions will promote the learning of new ways of working, the acceptance of new responsibilities and the encouragement of a more commercial attitude. At the same time, recommendations have been made for the transformation of the Training and Development function towards some good practice standards.

Challenge. A Bangladeshi trainer is more likely to have been exposed to Western ways of working: specifically the continuing influence and impact of the British post-colonial relationship and of the USA through aid programmes and the US-based educational system found in many Universities. However, the day-to-day training activities in organisations are still designed around a framework that can be described as "traditional": class-room style layout for 60 participants; lectures delivered to large groups of silent students; long courses lasting up to 6 weeks covering everything to do with banking; no use of audio-visual aids; little or no measurement of training and learning beyond the use of a simple reaction-level questionnaire. The challenge is to gradually transform the function and move it towards international good practices.

Solutions used. In the initial stages, the approach has been similar to that described in the first case study. Learning events need to take place at a pace that allows for adequate comprehension and absorption. Parallel work with the Training Faculty involves stretching their perception of the learning process and developing a greater repertoire of skills to deploy. This is work in progress, but continues to be a source of great

fascination (and frustration) in attempting to introduce First-world thinking to a Third-world setting, or more accurately, ideas from developed economies, into an organisation that is firmly part of a developing nation

Learning points. This assignment is continuing and so any commentary has to be seen as work-in-progress. Despite the very great differences in cultural landscape, political environment and economic wealth, the situation found in everyday Bangladesh meetings is sometimes similar to those that were found in China. The willingness to listen and learn is genuine and intense, but the perceived gap between the good practices and their organisational reality has been revealed as so wide as to appear un-bridgeable. We are encouraging learning by means of such approaches as: realistically small steps to be taken at each stage; modification of the good banking practices to suit a reality of partial electrification and no computerisation; distillation of the essence of a work-practice without a rigid application of specific procedures; clear articulation of a loose-tight philosophy. In this latter instance there will, for example, be 'zero tolerance' of corruption and mismanagement of bank funds, but there may be a far more lenient view taken towards the continuation of old-fashioned, manual work processes, even though they are clearly **not** good practice. The timescale for achieving change has to reflect the reality of life in Bangladesh.

So what? Some lessons learned

What are some of the lessons that can be drawn from these situations? If the explicit challenge for the practitioner is to establish "learning" and a personal agenda might include encouraging a passion for knowledge, how can these be achieved across the boundaries of culture? It is readily acknowledged that the range of "learning experiences" covered by these examples is limited. They are all set within an organisational context; most of them were concerned with the transmission and learning of new knowledge or management skills; the examples did not involve more profound behavioural change or deep learning about personal relationships. It may well be that these lessons could apply to those more intense learning experiences and perhaps that is a topic for more rigorous research. This paper makes no claim for universality or generalisability: the limitations of the sample are recognised and accepted. But it may be that some of the lessons learned can be relevant for other learning associated with change, reform and organisational transformation. Some of the ideas that emerge from these experiences are summarised below and can be expanded upon in the conference session if required.

Lesson 1: Meet expectations and conform to stereotypes

This was one of the behaviours that caused most anguish at first. A western management trainer working in a way one hopes is informed, reflective, enlightened and reasonably

progressive will be striving to avoid clichés, stereotypes or predetermined mind-sets. However, in establishing a relationship with a client or with learners in a SE Asian setting, it is often effective to at least conform to ***their*** stereotypes. Personal experience of "confronting preconceived ideas" with a group of Chinese managers at the outset of a training session has revealed that such a confrontation, whilst ethically pleasing and consistent with my personal principles of effective adult learning, might not be the most effective route to gain their 'engagement'. A pragmatic solution is to start from where the learner expects you to be: a westerner with new ideas; an expert with something to teach them; a person who might be expecting something different from the group. But the trainer will still be seen as the authority figure, a person with knowledge to decant into the waiting, empty, vessels. Standing on the dais behind a large lectern decorated with a suitable banner, microphone in hand, translator at one's elbow, an ineffective start would be to announce proudly that "We are all going to learn together today ……."

Lesson 2: Become adept at working beneath and beyond surface behaviours

It is not enough to know that the stereotypical Thai worker will sit quietly, smiling at the trainer, or that the Chinese student will be writing down everything that is said. Those statements are true, and until the organisation has progressed somewhat, will remain an unavoidable reality. However, a deeper truth lies beneath the surface that has to be uncovered. What does the smile actually reveal, or more tellingly, what does it conceal? What is being written down so assiduously by those Chinese bankers? What questions are **not** being asked by my Bangladeshi colleagues? Some examples of ways that seem to work in breaking through these surface behaviours to enable western tools and techniques to take root were alluded to in the case-studies. They include: encouraging mild and safe experimentation amongst the learners; formalising small-group discussions as a means of generating "feedback" and "discussion"; encouraging anonymous commentary through the use of a spokesman; issuing written materials ahead of time; keeping to a strictly defined agenda and timetable; when possible, delivering some pre-learning coaching to the participants to show the types of behaviour that will be allowed. This latter example is most relevant where diverse cultures will be working in the same group, since the participants will react in different ways and individuals from less-demonstrative ethnic groups will participate least, unless coached beforehand to move out of their cultural comfort zones.

Lesson 3: Recognise relative speeds of learning and act accordingly

This insight conveniently ignores some very profound issues around the nature of development and what we can realistically define as "learning". Taking a limited, organisational focus, and using "learning" to refer to the mastering of new work-related skills, knowledge or attitudes, it is possible to draw some conclusions about what may work best in this type of setting. I have found the relative speed of learning is a function of, *inter alia*, the

language skill (of the trainer, the participant or the interpreter as appropriate), the degree of "foreignness" of the concepts and the intrinsic motivation to learn that arises from the situation. The impact of language skills is self-evident. Learning in one's second, or quite possibly ***third,*** language, requires significant additional time for processing of ideas and reflection on their significance. It may be necessary to break down the learning into far smaller units than we might want, driven as we are by the inevitable constraints of project timetables and limited availability of the learners. The 'foreignness' of the concepts relates to the need to understand how alien the ideas are likely to appear, and how much the learners may be pre-disposed to consider them. Enabling a group of middle managers to learn how to make a new Appraisal system effective may not present too great a challenge. They already know about the principles of performance review, and now realise that, with only an old-fashioned system in place, better methods are surely available. They are likely to be willing to hear my ideas for improvement of the system and of developing their skills in conducting performance reviews. On the other hand, educating line managers on the subtleties of the western notion of Accountability, presents far more problems. Firstly it is a concept that does not sit happily in a culture of conflict avoidance or of upward-delegation. Secondly, it presents the learners with profound challenges and a radical change in the nature of their relationship with the organisation and their boss. Learning in this situation will be slow, at best. Repeated exposure and frequent reinforcement through other means may be a method to overcome this initial hostility and incomprehension.

Lesson 4: Strive for culture-free design of learning and development

This appears axiomatic, but the practicalities of implementation remain an issue. So much work of experienced trainers and facilitators becomes 'second nature' (thus freeing the facilitator to deal with the more challenging issues around process and group dynamics) that the underlying assumptions upon which their practice is (or should be) grounded, are overlooked. The lesson here is to reappraise the basis for some of the designs and interventions we use and to consider the way that they might be amended to be less culture-specific.

'Hints and Tips' for practitioners in the field

What practical and personal advice can be offered to a practitioner faced with the challenge of stimulating and developing knowledge, insight and learning in another culture? It is hoped that the real-world illustrations given in this paper will encourage the practitioner to undertake challenging work in foreign cultures by showing, despite the real differences and apparent difficulties, that learning ***can*** take place. Indeed the sense of achievement and pleasure in helping to achieve this learning is considerable. To support those ambitions, based on the learning from these very different settings and from an understanding of current thinking

about effectiveness in cross-cultural settings, it is possible to distil some personal, possibly somewhat idiosyncratic, *"Hints and Tips*" to guide and support future praxis.

Tip #1: Know your subject

This appears obvious, and indeed it is a fundamental requirement for an effective advisor in any field. However, the intention is to remind the practitioner of the need to thoroughly understand all aspects of the subject under discussion, and the process to be used. This is particularly important within the context of some Asian cultures, and certainly within the developing world, because the client is often seeking "expert assistance" and not the "process consulting" or "learner-centred" approaches with which many of us are familiar. For example, in a situation where the aim of the practitioner is to enable learning about a new management technique, it is likely that the client will demand to know:

- The source of the recommendations. "Who has suggested this?"; "Where did these ideas come from?"
- The reasoning behind the detail of the recommended changes
- Other companies doing things this way. This seems to be a common request amongst Asian companies: "Who else is doing this?"
- Past experience: "Where else have you done this type of training, and what did you learn by doing so?"

All of these are examples of the sort of preparation that might be necessary and appropriate before embarking on a "training programme" in an East Asian setting. The education system through which the employees grew is likely to build teachers to be the experts to be listened to and respected. It is difficult for the learners in an organisational setting to change that mind-set in an instant; therefore the onus must be upon the practitioner to at least demonstrate mastery. Of course, it is also essential to thoroughly understand the analytical models and tools you are using, particularly if this is the first such implementation of the technique you have done. Being seen as an expert becomes a necessary element of establishing an environment that is conducive to learning. Demonstrating personal mastery of the topic will enable the trainer to move to deeper, more satisfying levels of work. Without establishing that status at the outset, it may be impossible to move to learning experiences that are more intense and demanding for the participants.

Tip #2: Know your client and get into the organisation

Again, this may appear self-evident, but the implication behind this tip is to make sure the practitioner thoroughly understands the client structures and the social settings within which one is attempting to create "learning".

- Who are the key opinion-leaders and influencers? These individuals will not always be at the top of the organisation chart, and may owe their power to membership of the

ruling party or their role on the Communist Party District Committee. Family relationships are a natural source of power in many societies, but these relationships may not appear obvious to a newcomer.

- How does the informal structure work? What natural groupings of workers might form reasonable groups for learning? Can the trainer exploit the informal networks to achieve some 'quick wins' in the learning programme by successful interaction with these influencer groups?
- Which key individuals do you need on your side in negotiating changes to internal control and interaction processes? This is often a precursor to the actual training events and so, in some situations, will need to be handled carefully.

Being able to understand the non-formal and the un-written aspects of the organisation may make all the difference as at the outset of a series of significant learning events. Successful implementation of Tips # 1 and 2 will earn you the right to work at an appropriate level and in an effective way, within the organisation.

Tip #3: Conform to stereotypes before moving on

The client will inevitably have a pre-conceived idea of the role of an external consultant / trainer and they will have already formed a view about working with an international expert. For example, they may have a (mistaken) belief that the practitioner has a pre-determined set of successful solutions to be applied in any situation and they may not be comfortable with an approach that emphasises discussions to find out the "best" solution. My tip is to go along with the expectations for the early part of the assignment. If the leaders want to be told the right answer to a situation, or to be given unequivocal advice, give it to them. The time for discussions with a less strong 'expert-led' focus can come later; after the right to operate under different circumstances has been earned.

Tip #4: Stay focussed, but allow for distractions

The ideas that I have put forward here do not do justice to the complexity of learning in the real world, and the implementation of a training and development programme will face challenges and set-backs. During a long assignment there will be many events that will be perceived as a distraction by the results-orientated consultant: frequent public holidays, the impact of religious observances (running demanding training events during Ramadan is always a challenge), political strikes and demonstrations curtailing the working day, the impact of extreme weather and so on. The impact of these on the training programme and scheduling need to be acknowledged and respected, but the effective consultant will remain committed and strong and will demonstrate modest, but undeniable, self-belief throughout the course of the design and implementation of the training.

Tip #5: Live with ambiguity

Work across culture boundaries is bound to involve considerable confusion, ambiguity and lack of knowledge. Unless one is particularly gifted or very fortunate, the work will be conducted within an environment that uses a foreign language, where even the signs by the lifts identifying the floors are incomprehensible and where all documentation is written in a script that you cannot read. Asking for everything to be translated so the westerner can understand the organisation is ponderous, expensive and slow. It may be better to coach some local consultants to understand what it is that you want to find out and have them read the job descriptions and organisation charts with a view to providing you with a summary of the training needs. This can often be enough detail for you to proceed. Sitting in a focus group being conducted in Mandarin won't allow me to understand the detail, but assuming that I have coached the local facilitator in the process and the questions to be asked, I can gauge reasonably accurately how the meeting is going. I try to take any chance that arises during the session to have a private conversation with the facilitator to help resolve any difficulties that emerge. It is imprecise, messy and ambiguous, but that might just be the price that has to be paid for working there.

Tip #6: Pick your fights carefully

Not all of the ideas that the trainer wants to put across will be readily welcomed or even accepted. Be clear which are the ones about which you are going to be ruthless and unbending. Stick to your guns on these since it is, in part, your reputation on the line. However, there may be some recommendations, perhaps those relating to ideas from outside that are 'suggestive' rather than 'prescriptive'. Here you might be a little more permissive and allow the client to amend the way that you have put forward for working (as an example). By only getting involved in the fights you really need to have, you might save a great deal of mental and physical energy. Incidentally, of course, I do not actually advocate 'fighting" as an effective client management strategy, but the intention of the adage should be clear.

Tip #7: Coach a local team to take over from you

No-one is indispensable and you will need to move on sometime. Pick the people you think can carry on the training work after you have gone. Coach, train and support them. Develop their understanding of your western ways, and then build them up in the eyes of the rest of the organisation so that your exit strategy can be implemented at a time of <u>your</u> choosing. I have found that by the time this work has been done, even those trainers who appear to be very 'small' or 'low' in the organisation will have become more acceptable to the client groups through their association with the international trainers.

Ideas for further research

The perspectives in this paper are offered up with a strong practitioner focus and genesis. However, there would also be significant value in exploring these concepts with a more rigorous, academically-sound methodology. Some potential research questions might include:

- To what extent can commonly accepted models (such as "Learning styles" or Emotional Intelligence) be applied to specific cultural settings? Indonesians may have different preferences and characteristics from Filipinos, who in turn are very different from Bangladeshis. And does it matter in practice?
- In what ways might these differences be manifested in behaviour: either during the learning or in the application of learned behaviours at work?
- Do insights developed from working at the level of cognitive change, also apply to more complex learning in situations such as problem-solving, creativity, interpersonal relationships, personal development? If so, to what extent?
- How far do learners working outside their own cultural upbringing experience cognitive dissonance? And how do they cope with it if they do?

Deeper, more objective, research on certain areas should prove valuable in creating the theoretical underpinning that this important topic deserves. In the meantime, it is hoped that these personal insights might stimulate, guide and encourage other practitioners in their work as they facilitate learning at, or across, the boundaries of cultures.

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Further general reading

General introductions to working in other cultures can be found in popular titles, such as Lonely Planet guides. These are written from the perspective of low-impact individual travellers and, whilst unabashedly anecdotal, do contain some useful and relevant insights for those about to work in a foreign culture.

Any other books form a good starting point for potential cross-cultural work by providing the background upon which more detailed, specialised, reading can take place:

Draine, C., & Hall, B. (1986) Culture Shock Indonesia. Singapore: Times Books International

Elashmawi, F., & Harris, P.R. (1994) Multi-cultural management: New skills for global success. Kuala Lumpur: S. Abdul Majeed & Co

Endnotes

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[2] Empirical data in support of this statement is not given here, but examination of the most frequently displayed Journals in any Library will bear out the assertion.

[3] For example, see article on Maths performance of US vs Asian students in Christian Science Monitor, December 16 2004

[4] Using "Asian" as an adjective is, of course, a gross over-simplification, and it is intended to look at only a few examples from this rich and diverse group of nations and cultures that covers one-third of the world. Incidentally, the use of the qualifier **East** Asia effectively rules out any discussion of Western Asia (Pakistan/Afghanistan) or North Asia (Japan and Korea). South East Asia is taken to include the countries of ASEAN. One of the cases in the paper comes from Bangladesh, and in normal usage, this country would be considered to be part of the Indian sub-continent, or South Asia.

Learning as a dialectic relation between practicing and reflecting

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Abstract

In the following paper is described how learning and development in complex organizations can be conceptualized. The program developed portrays learning as dialectics between practicing and reflecting – according to the activity theoretic principle of reification and appropriation. It has been applied in a two level program where operational practice is reflected on a learning platform and the outcomes of the platform are realized in operational practice. The following considerations that are based on a qualitative empirical study do not only focus the learning individual but also mutual effects between learning individuals, affected working communities and the organization as a whole.

Introduction

Learning in practice is illustrated in social theories of learning such as Legitimate Peripheral Participation (LPP) by Lave and Wenger (1991). They describe the process how an individual becomes able to act within a social system well known as community of practice. However this and related learning models neglect, despite their important contribution, the aspect 'acquisition of knowledge' through 'reification of practice'. A facet that activity theoretic models of learning (e.g. Engeström 1987; 2001) or Deweys concept of experience and inquiry (e.g. Dewey 1938/1988; Elkjaer 2004) recognize. Both consider the appropriation of theoretic knowledge and the reification of practice through reflection.

All of these models consider learning not only as acquisition of knowing and knowledge but emphasize the aspect of development of the learning individual and the social system, the individual is embedded in. Although the majority of these concepts are related to school education (e.g. Chaiklin 1999) or processes in social life (e.g. Lave 1993), I consider them as a promising basis to describe individual learning and collective development in complex organizations such as large companies. However the object of study should from my point of view be extended from the individual and the surrounding community of practitioners towards a complex system of mutually influencing communities under the roof of an organization providing formal rules and structures. One should take into account that within organizations there exist numerous interacting and competing communities. Furthermore within such a complex and dynamic system, different views come together and newcomers are not really novices but they carry elaborated experiences from different contexts with them.

The question arises, how learning in organizations can be realized under that framework conditions, bearing in mind the aspect of individual and organizational development. Activity theoretic approaches (e.g. Raeithel 1998; Engeström 2001) emphasize both: reification of knowing and appropriation of knowledge. Reification is done through reflecting on practice and distinguishes the expert from the experienced actor (e.g. Schön 1983; Dreyfus/Dreyfus 1986). However it has no meaning for practicing if this theoretic knowledge is not applied

again in specific situations. Hence the ideal learning process provides a dialectic relation between reification and appropriation between the development of knowing through practicing and the generation of knowledge through reflecting. In organizations this can not be seen as a singular relation but as an overlapping and woven process of interacting individuals and communities. Hence for conceptualizing and describing the learning process the question arises, who should reflect on what and how? Providing input and exchange on the organizational level the reflection process should go beyond single communities of practice. On the other hand since CoPs represent operational practice as real cooperation relations, outcomes of the reflection process can only be realized within each single community. Key successful factor for reflected learning I see in the intelligent amalgamation of reflecting and practicing on individual and collective level.

In this paper I argue that situated and activity theoretic learning approaches in combination provide a considerable contribution to describe learning in social practice. However they do not sufficiently meet demands of individual and collective learning in dynamic and complex organizations. Therefore I conceptualize in the following learning as dialectics between comprehensive reflecting on operational practice, and applying reflection results in practice. I start with a theoretic view onto the terms knowing and knowledge since apart from knowing – the ability to act – knowledge coming out of the reflection of knowing, becomes growing importance in working processes. Then I will consider the learning models mentioned above more detailed. Levels of consideration are the individual, the community and the formal organization. In a case study the realization of the model is described as well as empirical findings of its application.

What has to be learned: The characteristics of knowledge and knowing

Some theories considering learning as a social practice, overemphasize the meaning of knowing as the only source of practicing. However, I see as mentioned above, a dialectic relation between (practical) knowing and theoretical knowledge. Before this position will be discussed further the characteristics of the two terms shall be defined.

Knowledge and knowing

Either from an activity theoretic or situated learning view, acting within a social situation primarily requires the ability to do, which is a practical type of knowledge. This can be defined as ‘knowing how’ (Ryle 1949) or ‘knowing-in-action’ (Schön 1987). ‘Knowing’ underlies the process of doing something, the dynamic quality of knowing (ibid.). This type of knowing is intuitive and tacit; the acting subject himself is not aware of its knowing during the action (Polanyi 1969), because, according to Polanyi’s analysis of the process of action, the focus of the individual is concentrated on the goal or on the general intention of the action rather than on its single elements. he/she clearly distinguishes between explicit knowledge,

such as theories, and practical knowing, which is considered specific and tacit (Neuweg 2001). Theoretical knowledge can be gained from practical knowing by means of reflection and analyses. Therefore, knowing can be made explicit to some extent, but it can never sufficiently describe practice (Polanyi 1966)[1], Polanyi presents an individualistic view; he/she conceptualizes the process of acting and the relation between knowing and theoretic knowledge in a very detailed way. Therefore, I see it as a basis for considerations of collective activity and organizational processes.

To summarize, according to Polanyi (e.g. 1966) and Ryle (1949) it can be distinguished between three different facets of knowledge:

a) background knowledge which is of tacit character and influences the way of acting
b) tacit knowing that is directly linked to the process of acting
c) theoretic knowledge that is explicit and not directly related to a specific situation.

Acting and reflecting

As Dreyfus/Dreyfus state, theoretical background knowledge is not necessarily needed to act (1986), a fact that some ethnographic and activity theoretic studies confirm (e.g. Luria 1986; John-Steiner/Mahn 1996). The integration of theoretical background knowledge into the performance of an action, however, distinguishes the expert from an experienced actor. The latter concentrates on the best performance of his/her action, but the former reflects on his/her action in the light of his/her experience and knowledge (Dreyfus/Dreyfus 1986). Action without the use of theoretic reflection may lead to 'implicit blindness' (Margolis 1987), since practice is carried out without rethinking its performance. Unreflected action neglects environmental conditions and the evaluation of action results what may lead to failure of knowing. Therefore, change in the way an individual thinks and acts, as a result of failure, is almost impossible. With growing experience, the actor will become a more or less experienced actor, but the expert level will not necessarily be reached (see figure 1).

Level of knowing :	Way of acting:	Actor's focus:
Inexperienced actor	Aware, rule based	Action oriented
↓	Aware, context based	↓
Experienced actor	Intuitive, context based	Focus on effects of action
⇣	Intuitive, context oriented but also reflected open for change	⇣
Expert		Focus on optimized action

Figure 1. *Experienced acting vs. reflected acting (Dreyfus/Dreyfus 1986; Neuweg 2001)*

Theory can be regarded in two different ways. Members of an organization develop and share background assumptions on how the organization works. These 'theories in use' (Argyris/ Schön 1978), convictions and values are brought about by means of cooperation and communication. Since they rely on a specific context, they can be considered as 'local theories' and actors are normally not aware of it (Elden 1983; Baitsch 1996). Background assumptions are visible in the way people speak and act. Explanatory or scientific knowledge, however, is part of an 'espoused theory' (ibid.), which is developed by means of the reflection of processes and of the theory in use. The espoused theory is explicit and abstract, and presents a general type of knowledge.

Concerning the reflection process, Schön distinguishes between two levels (1983/1987). On an operational level, reflection is carried out without interrupting action. Contents of this 'reflection-in-action' are mainly closely related to actions and provide an alternation between acting and reflecting. This process can be caused by diverse contradictions in action. If the flow of action is interrupted by reflection, Schön talks about 'reflection-on-action'. The primary activity is overlaid by a secondary activity that reflects the primary one. Reflection-on-action often questions general principles on activity. Reflection-in-action can be seen as primarily influencing the theory in use. The development of an espoused theory out of practice, however, can be considered as an activity itself, based on reflection-on-action.

Bearing in mind the relation between explicit knowledge and knowing learning activity can be seen as dialectics between reification and appropriation: Knowing in practice is reified through its reflection. The espoused theories coming out of this process are applied through practicing. The tacit knowledge of the acting individual in terms of theories in use and convictions provide the basis of this process (see figure 2).

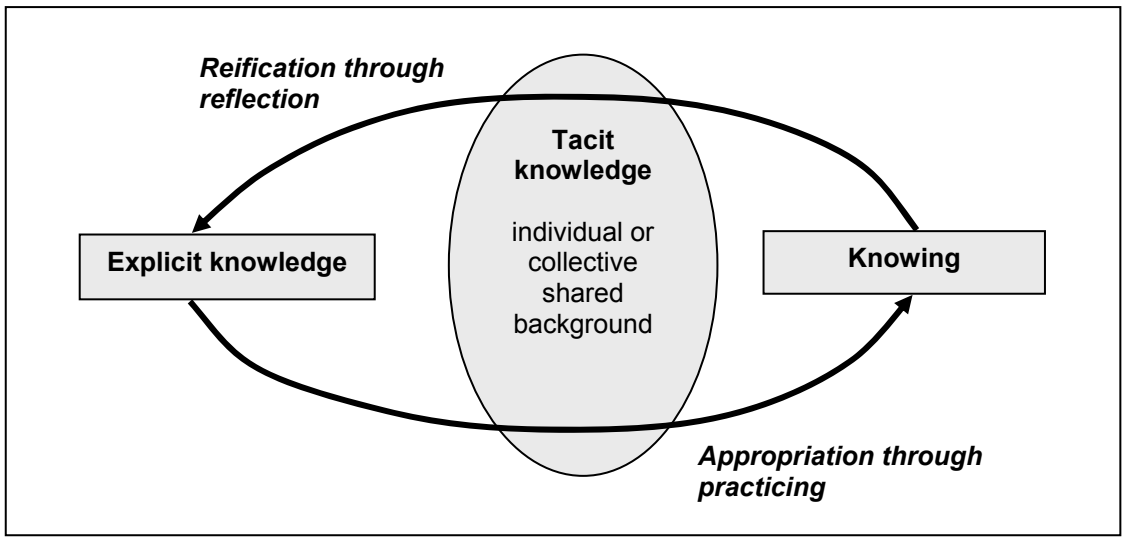

Figure 2. *developing of knowledge and knowing through acting and reflecting*

Knowing and knowledge in organizations

Activities take place within a social system; therefore the other individuals of the system are also affected. This kind of social system is in organizational learning studies generally depicted as community of practice (CoP) (Lave/Wenger, 1991: 98; see also Brown/Duguid 1990; Swan et.al. 2001). CoPs can be seen as the context of activity. The expression context in a theory of practice view should, however, be considered not only as a framework of space and time but also as a system of corporate activity that includes action, relations and corporate understanding (Engeström 1990; Rogoff 1995). Tacit knowing and background knowledge are strongly related to that context. However many of the works based on the community of practice concept neglect, that they are frequently embedded in organizations that provide a structural framework and formal rule system (Contu/Wilmott 2000). Therefore activity should not be considered as only related to a CoP but also to formal framework conditions influencing it. Furthermore Engeström et al. mention in their work of networks of activity systems the importance of regarding the interrelation between the systems (e.g. Engeström et al. 1999; Kerosuo/Engeström/ 2003). Since the concept of activity systems is to some extent comparable to CoPs this aspect should be taken into account.

Within an organization, there exist a number of communities of practice. They are overlapping (Lave/Wenger 1991) and competing within organizations. Considering the knowledge aspect, the communitarian base of shared background knowledge is overlaid with a more general commonly shared background understanding (theories in use and convictions) related to the organization as a whole. This understanding is, however, strongly associated with organization specific attitudes, whereas the communitarian shared background knowledge comprises activity-related aspects (Schulz 2005 in press). Espoused theories as explicit knowledge are not related to a specific level of consideration. They include aspects relevant either for individuals, communities or organizations as a whole. Espoused theories are accessible as information throughout an organization but its understanding requires (tacit) background knowledge either profession-specific (e.g. scientific theories) or context-specific (e.g. work orders).

Therefore it may be useful to supplement a third level to the individual and the community of practice: the formal organization as a structural framework and formal rule system where the other levels are embedded in. I consider an organization as a system of such explicit rules and structures, that are however influenced by the external environment and the internal activities of its actors. Individuals are formally assigned to the organization which is addressable by them and from the environment (e.g. Scott 1995). In terms of CoPs it should be recognized that they likely go beyond organizational borders, and individuals may be members of different communities at the same time (Lave/Wenger 1991).

Learning as growing into practice

Lave and Wenger describe the process of an individual that grows into an existing community of practice. They call this apprenticeship model 'Legitimate Peripheral Participation'

(LPP) (1991; Lave 1993), which is a theory of situated learning and can be seen as a general principle of the development of knowing and theory-in-use in a social context. Considering this process in detail the importance of the dialectics between knowledge and knowing, between practicing and reflecting is shown. The authors describe how individuals begin to participate within a community, starting from a peripheral position. They state that the most important aspect of learning is to provide the newcomer access to the community – to legitimate his/her participation. Learning itself is carried out without a didactical program, directed by actual requirements within the community (1991). Although the authors do not clearly distinguish knowledge aspects within their model, the first steps can be considered as an appropriation of theories in use and convictions of the community members by the newcomer. Secondly he/she develops knowing based on his/her former personal background and the aspects of the theories in use he/she appropriated. Espoused theory, which the authors call general knowledge, is not of primary importance for their learning model (ibid: 33-34). This means, according to Dreyfus/Dreyfus (1986), the process of growing into a context remains on the level of the experienced actor.

Although the model provides a significant contribution to understand processes of learning through growing into practice, in terms of activities within complex organizational contexts it may be considered as being incomplete. It should be taken into account, that newcomers who enter new communities usually gained experience in other contexts. Though their work in general is comparable, context-specific activity may vary (Raeithel 1983). Additionally the newcomers are, due to their experience, in a position to reflect context-specific activity in light of theoretic knowledge. Therefore the learning process starts from a different level and is not restricted to appropriate existing practice, but also challenges it.

These facets have a tremendous impact on organizational aspects of learning. Lave and Wenger consider the reproduction of the community of practice as a major effect of LPP. Newcomers replace established members step by step. This effect goes along with change since social practice is never reproduced one by one. An experienced newcomer is likely to be a challenge for an existing community since he/she can question existing practice through reflecting the new activity in light of his/her former experience. In that case the tacit or explicit comparison of the two working systems may cause contradictions. This is very often the case in organizational mergers in which two effective types of practice are confronted with each other (Schulz/Peréz 2003). If the community fully legitimates the newcomer, the contradictions may cause a discursive process that reifies tacit background knowledge and its effects on practice (Brown/Duguid 1991; Orr 1996). Effects of this process can vary between the entire rejection of new ideas, up to full acceptance. However, even in case of the complete acceptance the new ideas exist only as concept that has to be realized through practicing. Hence first result of the corporate reflection process is the development of theory out of practice. Therefore, practice can be reified in theoretic knowledge, an aspect that Lave and Wenger and other ethnographic-based learning theories neglect (e.g. Resnick 1991; Rogoff 1995; John-Steiner/Mahn 1996). Activity theorists regard the dialectic of knowledge and

knowing as the dialectics of reification and appropriation (Engeström 1987; 2001; Raeithel 1998). This means theoretic knowledge provides the basis for the development of knowing in a specific context. On the other hand knowledge can be developed out of knowing through the reflection of practice. Despite this dialectical process, it should be born in mind that communities are not independent systems but embedded in formal structures and overlapped by others. Therefore they influence each other. Further, CoPs follow similar processes in parallel, and change within one system always affects others as well. Thus, change and development of a community of practice is, as mentioned before, includes aspects of power. It is a competition with other communities trying to reproduce and develop at the same time.

Hence, learning as dialectic relation between practicing and reflecting, should not only be considered on the dimension 'learning individual', it should also take into account the dimensions community of practice and formal organization. They may also be affected by the reification of practice and application of theoretic knowledge. Since reification creates explicit knowledge out of practice which is more or less accessible throughout an organization as a whole[2], espoused theories normally diffuse from one community throughout the organization to several others. The reverse process, the appropriation of theoretic knowledge is done through practicing and therefore individualization process (see also Raeithel 1983; 1998).

How these aspects can be considered in a learning program in a complex organization is described in the following.

A conceptual model of learning as dialectics between practicing and reflecting

To overcome the aspects criticized in the above learning theories, a conceptual model has been developed that fosters learning through the amalgamation of the two aspects reflecting and practicing. It consists of two levels. On the level of 'secondary activity' operational practice is reflected, reified and discussed. This is called the 'learning platform'. On the level of primary activity knowledge and experience from the secondary activity is realized through application at the workplace. On the learning platform representatives from operational work communities meet for corporate activity which is closely related to their primary activity. There exists a variety how the secondary activity can be designed and what type of process or organization the participants represent (e.g. Schulz 2004). The representatives may meet on a regular basis in parallel to their operational work or sequential for a certain period of time. However, following aspects are identical, apart from each single application: The participants of the learning platform should represent different views of a complex process (e.g. the product development process). The learning platform is characterized through corporate activity in the work life context, hence discussion or instruction are part of the process. The learning platform has to be conceptualized in a way, that direct interrelation with operational communities is ensured (figure 3).

In contrast to common 'Continuous Improvement Processes' (CIP) the general intention of the conceptual model presented, is to enable collective and organizational development through the learning of individuals. Furthermore not only working contents within one community of practice is considered but operational practice as a whole and from different views. Additionally, reflection is not an abstract action to work out a given agenda, but it is embedded in corporate activity. Due to the fact that learning and reflecting takes place in the real life context, reflection topics emerge during corporate activity.

In the above theoretical considerations to knowledge and knowing the meaning of tacit background knowledge and shared convictions is described. This knowledge aspect indeed is of high importance in the learning and reflecting process. If analyzing activity systems or communities of practice in the sense of Engeström or Lave and Wenger, they can be considered as working units whose members bear in mind shared activity related convictions and theories in use. This understanding however differs from community to community, dependant on activities and personal backgrounds. Corporate activity on the learning platform requires rule based acting from participants since it is to some extend a new type of action for them. Hence the way how to act has to be discussed and therefore different views come about. Over time this discursive process together with reflecting on the operational practice leads to a shared understanding between the platform participants. Due to the variety of views and the process depicted, the background can be seen as much more comprehensive as the one, participants had before. Once they are back at their work place, the cooperation partners are confronted with the new theories and understandings. A discursive process may start about the operational practice, questioning the existing long-established understandings. Change of shared understandings is crucial either for individual learning and collective development. It is especially the awareness of key aspects of the social and logistic processes of production. Participants are for instance able to explain backgrounds and coherences of their work

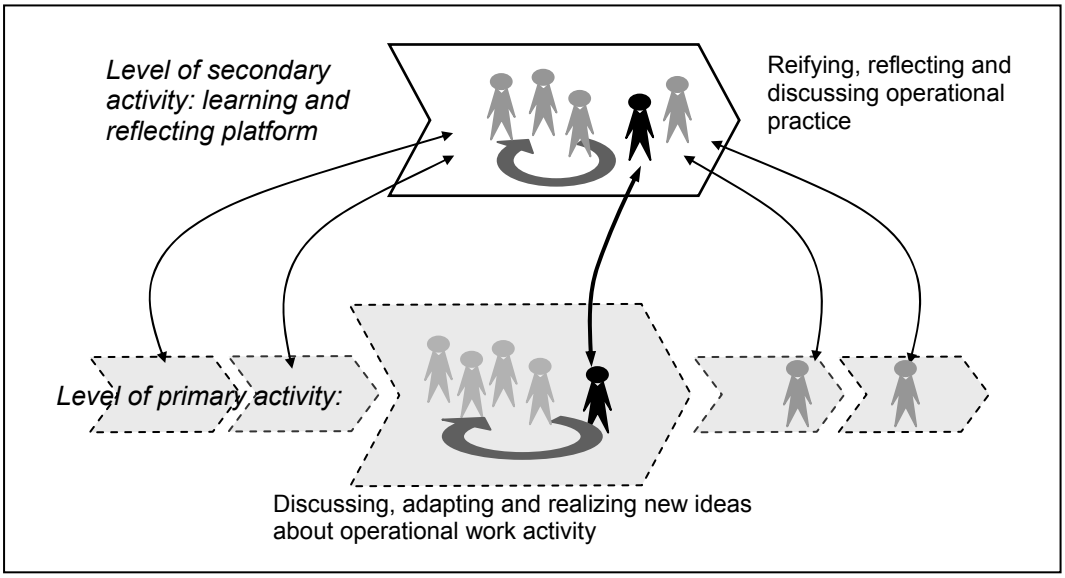

Figure 3. *Relation between primary and secondary level*

When developing this theoretic conceptualization towards a realization model, especially the transfer of ideas and convictions from the learning platform into operational communities provides several hurdles. However, this aspect is crucial for realization and therefore organizational development. Participants return to their operational parent community with new experiences and understandings. As mentioned, the community can accept, modify of reject the new ideas (see also Baitsch, 1996). Engeström (1987; 2001) says, that development of an individual may come about if the learning platform participant sees his/her operational practice as contradictive to his/her new experience. The learning platform can produce such experience. Furthermore, change in the activity of one individual affects the whole community. Therefore, the colleagues finally "decide" whether a community member can realize new activity or not. This does not mean that single actions cannot be changed without the acceptance of the community but if activity develops the whole activity system change (ibid.). If it is not only the individual that develops but the entire community, a consensus about the necessity and benefits of change is essential within the community (figure 4).

To summarize, following aspects have been recognized within the conceptual model:

- learning and working context have to be identical
- learning should include practicing, instructing and investigating
- apart from developing knowing, knowledge in terms of espoused theories should be generated
- views from throughout a whole process should be included in the learning process not only from a single workplace and the surrounding experience
- different perspectives from throughout an entire process should be included in learning
- participants should gain a collectively shared understanding of an organization as a whole
- apart from individual learning, organizational development should be the focus of the learning process.
- Especially reflecting operational practice plays a leading role in the learning process:
- knowledge should be created through reflection of practice, experiences, investigations and discussions
- intuitive practicing should be reflected and reified
- learners should become experts (Dreyfus/Dreyfus 1986) or reflected practitioners (Schön 1987)

How these aspects are realized in the learning conception is either shown in the case study.

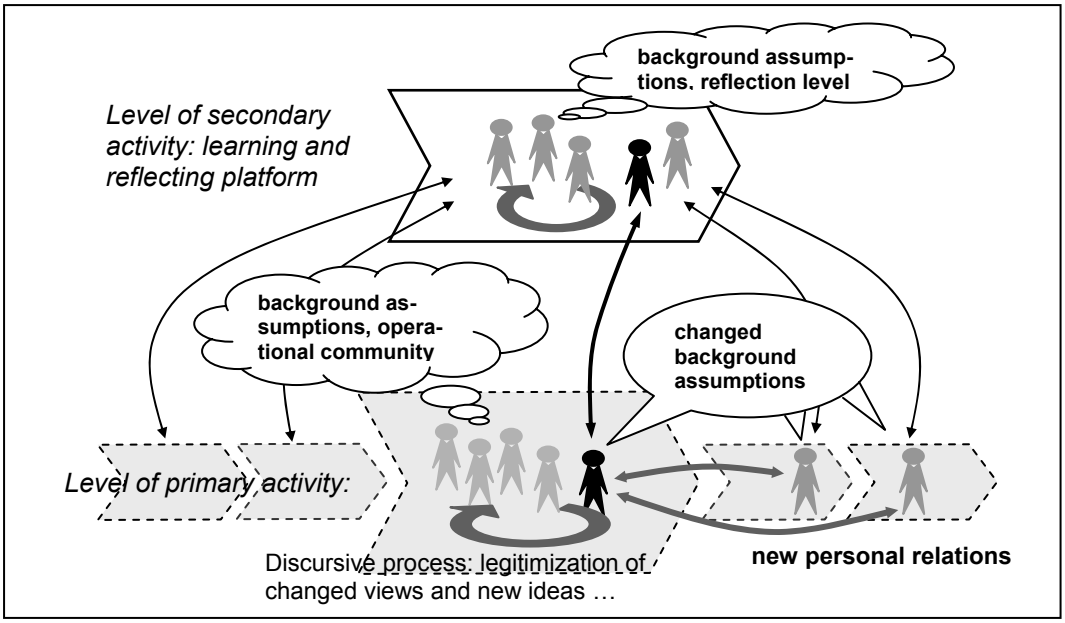

Figure 4. *Relation between primary and secondary activity and knowledge (Schulz, 2005 in press)*

Developing a learning program out of the conceptual model

In the 'operations' area of a global acting pharmaceutical company, which includes logistics, production, and quality control, the question occurred how the company can cope with frequent organizational change. Especially the combination between staff qualification, 'increasing a corporate understanding of the process chain' and 'developing operational practice further' has been aspects that should have been covered with a learning program. The program I developed entirely orientates on the above conceptual model: dialectics of practicing and reflecting between the two levels operational practice and learning platform. It can be seen as a complex process simulation taking place in the original working context. At the learning platform a group of approximately 10 to 12 people, originally working in different processes of the process chain, meets to plan, manufacture and check an original for-sale product within two days. They have to carry out all necessary activities at the original working places (offices, laboratories, shops), using original devices. Since in general each participant represents one production step he/she is the expert carrying out this step. He/she should guide his/her colleagues through these activities. However the expert role changes from process to process; therefore activity can be described as a permanent changing learning – teaching relation. Since the process is nearly identical with operational work, unforeseen events may occur. The participants act self responsible, they have to solve real-life problems and take care that they can finally deliver the product in time in the right quantity and quality.

Acting of the participants is mainly rule based and explicit, since they likely know the process in general but not its single activities. Even the 'expert' acts rule based, since he/she has to coordinate the group through the process. Consequently, reifying actions and instruct-

ing on how activities can be carried out play besides practicing an important role in the process. Permanent reflection-in-action (Schön 1983) takes place during practicing. Besides the manufacturing activities the concept of the process simulation provides time and space for questions, discussions and viewings. Based on the process experiences, together with the background knowledge of the participants intensive reflection on the operational work activities emerge. Together with the 'multivoicedness' of the participants knowledge their background assumptions are likely to be changed and expanded. Apart from new theories in use emerging, many of these theories are made explicit through the collective reification, reflection and discussion. The following example illustrates these effects:

> During the In-Process-Control – a quality check that takes place right after chemical production – participants realize how complex, manually complicated and time consuming this analytical activity is. Planners become aware that it makes sense to reduce lot sizes, to reduce efforts of analyses. This is however in contradiction to assembly workers who would prefer smaller batches that exactly represent finished product lots. Yet they realize that their additional effort is low compared to quality control. On the other side manufacturers and quality controllers can mediate consequences of short-term changes of the production program to planners.

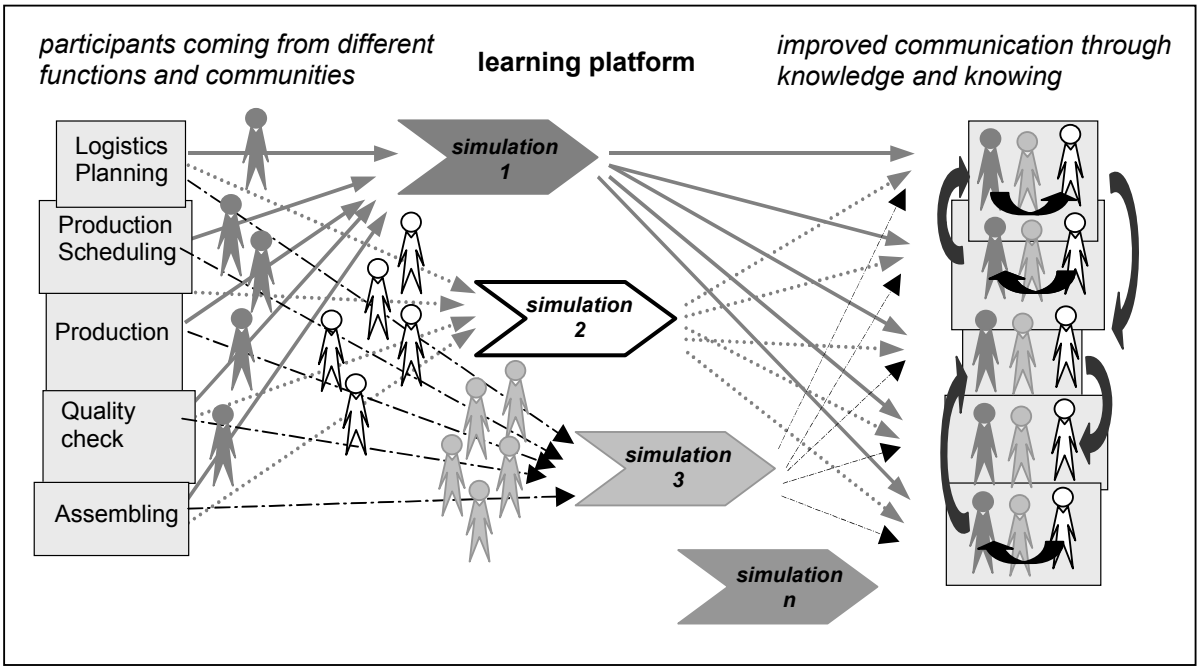

Figure 5. *Diffusion of enlarged understanding through successive performances*

Back at their workplace, participants are confronted with the existing theories of use of their operational communities. Their new convictions and proposed consequences for the activities of the community have to be communicated to colleagues. They may accept, ignore or reject the ideas. It is part of the whole learning program to provide a climate of acceptance.

This is done on two levels. Firstly, discursive processes within working groups[3] are brought about and formalized through frequent talks about the consequences of knowledge coming up from the learning platform. Secondly, and more important, the diffusion of the spirit and experiences from the process simulation is fostered (see Rogers 2003). Consequently, the process simulation takes place frequently with different participants. Hence experiences and the enlargement of background assumptions distribute under the members of working communities. However since colleagues participate at different dates with other partners, outcomes may differ but the general understanding is nearly identical. This enables corporate understanding within operational communities but also enforces discussions and change. Thus it is likely that new ideas will be realized. Furthermore results of this operational development deliver new input for the learning platform since they are communicated there by participants (figure 5)

Empirical results

In parallel to the performance of the learning program, I carried out a qualitative empirical study, to investigate the activity on the learning platform and effects of the process simulation on operational practice (Schulz 2005, in press). The process simulations were systematically observed, especially the ways participants act and learn, and reflection processes: there emergence, contents, contributors and results. Furthermore, participants and managers were interviewed about their appreciation of the process simulation on operational practice, either from an individual and an organizational perspective. It was especially investigated whether the learning platform influences change in operational work practice, and whether these effects are mainly singular, or affect entirely working communities, or the organization as a whole (ibid.).

Secondary activity: learning and reflecting on the learning platform

Observation results confirm that learning processes can be described in different facets. They can be seen as ongoing interaction between instruction, appropriation, reflection-in-action and reification. However performance of action remains rule based, participants do not become experienced actors since time horizons for each single action is too short for developing knowing. However participants develop knowing in recurring administrative tasks. Since action is highly reflected, explicit knowledge is of importance in this learning process.

The corporate activity and experiences of the participants together with the visual impressions of the working context provide the basis for reflection-on-action. Breaks between process steps or observations and instructions bring about discussions between participants. There, they reflect impressions in the light of their own background. Sometimes reflection emerges by chance through talks between participants about their operational work. The following scheme is typical for the reflection on the learning platform:

- One participant raises a topic due to his/her actual impression combined with his/her (implicit) background assumptions.
- Other participants that are interested in the subject contribute to the discussion. As a further step different views on the subject are exchanged. Thus theories in use are made explicit.
- In a discursive process explanations or solutions are searched until a satisfying result is found.
- Finally the contributors to the discursive process figure out the consequences of the results for their operational work.

Following example shall illustrate such a process:

> A laboratory assistant from quality control sees how the product she checks are assembled and indicated. She realizes that a delay in delivery of the product data coming out of the quality control process causes delays in the labeling. Together with production workers a discussion starts whether the labeling could be done later or the data could come earlier. A worker from logistics planning contributes. Analyzing the quality check and production process the discussants find out that opportunities to influence the process itself are rather limited. However, the current process to transmit the data is inefficient and limiting. The group works out how this could be optimized. The laboratory assistant and the production workers bear in mind what has to be coordinated once they are back at their workplace that the idea can be brought into life.

During the ongoing realization of the learning platform an effect occurred that was not intended and completely neglected at the beginning of the process: The learning platform has become more and more a forum where new cooperation relations are created or former formal relations are brought into life. As a result new operational working communities have emerged with an ongoing performance. At present this is seen as one of the major benefits by participants: In advance lists of contributors are searched and discussed in operational communities to find out beneficial cooperation partners. The emergence of new cooperation relations causes shifts in two directions. First, more direct communication, cooperation and coordination occur; it makes deviations over hierarchy redundant. Second, new cooperation partners change the map of cooperation relations in the organization significantly since relation building is a declared objective of participants.

Effects of the learning platform on operational work activity

Comparing interviews from the beginning of the learning platform program with later ones, statements differ significantly. At the beginning typical effects from external seminars and trainings were visible: Learning remains on an individual level, the surrounding community reacts with ignorance and rejection due to lack of understanding. With an increasing number of colleagues having participated in the learning platform there exists a collectively shared understanding of the whole production process[4]. This provides a basis and positive atmosphere for discussions on change of work.

Developing shared background understanding – in terms of theories in use and work convictions – can be seen as one of the major aspects of the learning platform. Interviewees state that they have hardly profited for their direct work but many of them said that their understanding about the process as a whole and especially features and constraints of other activities changed and extended significantly. Hence benefits show above all in communication and cooperation, mainly to administrative tasks. This aspect is substantiated by managers interviewed. They mention that they have realized an increase in direct communication, self responsible acting and decision making of workers. Furthermore internal complaints about product quality and late deliveries have reduced significantly. The following statement illustrates that fact:

> "... our interface between logistics planning and planning of chemical production has been affected through the learning platform. One of the logistics worker and our planner both participated at the same simulation. … Since they took part, they have regularly met to discuss their daily work problems and to explain their work instruments to each other. It is remarkable that they sat together with their instruments and difficulties to give help and feedback to each other. To see what can I improve, how do I work, how can I get access to effects of my work on succeeding activities,…." (Head of department of chemical production).

The share of changed background assumptions should be considered as the prerequisite that reflection about primary activities can take place in operational communities. Interviewees state that mainly with other participants from their community, a discursive process starts what the simulation experiences mean for the own collaborative work practice. They say, to non participants experiences can hardly be mediated. The discursive processes are however mainly related to optimizations of activities, or new non-operational activities are developed. Central operational activities are hardly changed through the input from the learning platform. Interviewees state that they consider the production process itself as normative and highly complex. So they do not feel in a position to influence and change operational processes. One example for the newly developed secondary activity is the understanding of learning as inherent principle of operational work. Therefore participants of logistics planning department developed a concept, how their activities can be systematically explained to people working at interface functions. Overall within the operational communities reflecting over work increased significantly. This aspect is fostered through the reification of practice on the learning platform. Theories in use and background assumptions become explicit there. Participants thus can give reasons for their acting and on the other hand they realize benefits of using espoused theories in communication:

> "The use of theories does beforehand not change the situation itself but it generates understanding from cooperation partners and therefore makes it easier. Additionally cooperation is smother since the others know what is going on." (Worker logistics planning)

As mentioned, developing new personal relations through participating at the learning platform is considered as being most important for operational work. Hence this aspect is fre-

quently mentioned by interviewees. They pronounce that these direct relations change cooperation activities significantly. Observations over a longer period of time show that these relations remain stable if they are combined with primary activities. Therefore a modification of communities of practice can be identified. However that does not mean that existing structures will be changed on the short run but existing relations are made reluctant. Therefore new activities are brought about through novel cooperation relations that on the long run influence organizational structures and rules.

In the whole process of realizing new ideas and concepts on the operational level leadership plays an important role. It can only be successful if supervisors and managers at minimum allow, better actively support these activities by means of providing space for reflection and discussion and considering the learning platform as a forum that gives important input for practicing. Empirical results show significant differences in terms of realizing new ideas and developing of activities between working groups where discursive processes are supported or not by leadership.

Organizational aspects

Organizational aspects, in terms of influencing the formal structures and rule system, can be seen, as mentioned above, (implicitly) as change of an overall understanding of the organization by its workers and (explicitly) as change of structures and regulations. Both aspects have been proved directly and indirectly with empirical results. Additionally an aspect whether organizational development has been taken place can be seen in the dialectics between operational and platform level. Since information transfer is unidirectional from the learning platform into operational communities, effects may remain singular or restricted to one specific community. If input in the learning platform, be it methodical or content related, comes from operational communities (as a result of discursive processes there), the effect should be seen as affecting the whole organization. In that case other participants on the learning platform are influenced, who carry this discursive process further. One example for such a process is the employment of the learning platform as a contact forum to personalize or build cooperation relations. This aspect goes along with reflecting, who may cooperate with whom to what benefit, and it is followed by the appropriation of the cooperation relations afterwards, which provide effects on the whole organization.

Conclusions

About situated and activity theoretic learning models I criticized that they, apart of their practice based approach, do not sufficiently recognize the situation in complex working contexts. Especially the aspect of overlapping and interacting social systems within the formal rule based framework ‘organization’ is not considered adequately. This assessment led to the above conceptualization of learning. However the point is not the principle itself but the ques-

tion how it can be realized in complex organizations such as large companies. There questions arise how the reflection process can be initialized and what range it should cover to provide sustainability and benefits for operational practice. The learning program has been successfully applied in a pharmaceutical company since three years. In this paper especially effects related to reflected development of knowing and knowledge and its succeeding application in practice are described. However the explanations not only focus learning effects but also consider it dependant from the different level individual, collective and formal organization. As a central learning produce the creation of a collectively shared background understanding about the entire process can be seen. It is created through a discursive process of different standpoints o the learning platform and it provides the basis for any further learning effects such as developing new activity. Figure 6 summarizes these learning effects on the different levels distinguished according to operational work activity and the learning platform.

Level of consideration	**primary activity – practicing in operational context**	**secondary activity – reflecting on operational practice**
formal organization	change of structures and rules through changed activities and new cooperation relations (long term diffusion effects)	input from operational communities, develops intentions and methods of the secondary activity further
collective (e.g. CoP)	discussing meaning of platform experiences for operational practice within the community; possible development and realization of new activities	discussions about activities including different views of participants; development of general solutions
individual	changed background assumptions lead to change of actions; realization of new cooperation relations	changing of individual background assumptions / developing new ideas for own practice through acting, watching and discussions in the light of the own work experience; developing personal relations

Figure 6. *Learning effects: relation between level of consideration and activity type*

Furthermore problem areas in the realization of the theoretic model have been identified. Especially sustainability, diffusion and realization of new ideas are aspects that should be recognized in concepts such as the learning platform. Particularly realization of new ideas in operational contexts requires permanent support by workers and managers, to some extend it is reached through a changed background understanding that is collectively shared. Diffusion and sustainability can be reached through a positive climate about the process itself and frequent performances with changing participants. In that case prerequisites for reflected learning followed by successful application are likely to be given.

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Endnotes

[1] This view is in contrast to some frequently mentioned knowledge management theories such as Nonaka/Takeuchi (e.g. 1995).

[2] This however does not say that it is also understandable in other contexts.

[3] Since communities in the sense of CoPs are no addressable units within an organization, level of consideration in that case are working groups.

[4] The diffusion process follows approximately the classical s-curve scheme outlined by Rogers (e.g. 2003).

Knowing what's said and what isn't: How tacit knowing theory helps us understand the value of silence and voice within the organizational climate

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Abstract

Much has been written in recent years about the implications of both silence and voice in organizations. However, the overwhelming emphasis has been placed on the assumption that voice is, for the most part, desirable while silence is undesirable or something to be overcome. We believe that many forms of silence and voice exist that are potentially either beneficial or detrimental to longer-term organizational performance. This is most evident when silence and voice are examined concurrently and when employee knowledge about silence and voice are better understood. Using a non-dichotomous view of explicit and tacit knowing, this paper explores silence and voice as purposive elements that compose an organization's knowledge context (Gerard 2001; Gerard 2003). Because managers are charged with safeguarding organizational health, practical issues relating to their knowledge of organizational culture as context are discussed. We also provide implications for future research.

Silence and voice may have positive and negative affects because they both depart, constructively or destructively, from group, divisional, area and organizational norms (Warren 2003). We argue that it is rare, however, that silence and voice operate in relation to one-another – one waxing while the other is waning. This is related to Van Dyne, Ang, and Botero's (2003) assertion that, "silence…is not necessarily the antithesis or absence of voice. It is also less likely that silence is functional while voice is non-functional and more likely that multiple forms of silence and voice operate with differential functionality, depending upon the types of silence and voice simultaneously enacted. Likewise, it is less likely that silence becomes detrimental when voice is beneficial and more likely that certain silence and voice work well together operational or that when silence is detrimental, that voice is beneficial.

We extend research by proposing an alternative way to view both silence and voice based upon organizational context. That is, we propose that the act of knowing organizational culture (e.g., climate, mood, structure) helps each individual frame when each is beneficial or detrimental. Based upon knowing theory, we acknowledge the importance of explicit and tacit knowledge in the production speech acts and non-spoken communication. We add to current research by including beneficial silence as an important consideration in research on voice and silence. We do this by contrasting three constructs - beneficial voice, detrimental voice, and detrimental silence – with beneficial silence. We conclude with implications for management.

Introduction

To better understand the choices an organizational actor makes to exercise voice or silence within an organization is to explore the cognitive thought process in light of the factors that influence and frame the choice. The ideal organizational member will learn to navigate the

oftentimes complex, oftentimes implicit cultures of an organization. Learning these complexities well will require the continued construction and reconstruction of knowledge that occurs through their interactions with a variety of persons. These include knowing and learning that occur as actions and reactions take place within the organizational context. While a substantial body of literature exists tying an actor and their collected beliefs to a mapping process (Eden 1988; Carley 1993; Laukkanen 1994; Markoczy and Goldberg 1995; Bood 1998), this explains but one piece of a more complex puzzle of knowing. There are other pieces important to knowing how what is said and what is not said impact an organization. We focus upon the pre-intentional and intentional characteristics of knowing that help shape what is known about an organization's climate and various microclimates. It is through this pre-intentional and intentional act of knowing that helps individuals determine what the organizational climate may be. This act of knowing helps determine what silence or voice may come to indicate for the individual and for various groups within the organization. It is our primary aim, then, to discuss silence and voice within an epistemological (i.e., theory of knowing) framework. The use of knowing theory permits a more holistic discussion of organizational silence and voice and, indeed, requires it given its openness toward the fields of psychology and sociology knowing theory preceded. Knowing theory also permits us to include a more gestalt look at pre-intentional and intentional forces that help form our understanding of silence and voice as a force in organizational settings.

Like any strategic resource, climate (i.e., organizational context) is as useful as it's relationship to a desired future outcome. Therefore, individual employee silence and voice, and the value of that silence and voice, should be judged on its potential for helping to achieve a desired future state. To successfully navigate the labyrinth of organizational culture, an individual's actor's actions are determined by his or her own perception of the impact and receptivity of silence and voice based upon a mix of dimensions. Actors must consider their own multiple roles, other actors' potential reactions, and their understanding of the organization's culture and climate.

Viewed through the collection of an individual's beliefs, an actor is able to determine the level of receptivity to silence and voice within the organizational climate. One key antecedent is the actor's state of knowing. Initiating with the individual's instinctual or pre-intentional states of human biological constraint, mental capacity, stance and attitude, and moving through the intentional states of emotions, intentions and beliefs; an employee must measure the relevance of the situation both qualitatively and quantitatively, and determine which act, silence or voice, is fitting. The individual actor needs to assess the organizational environment and its actors in concert to determine if the use of silence or voice is either beneficial or detrimental to: (1) the multiple perspectives adopted by the individual actor, (2) that individual's understanding of other actors, and/or (3) the organization.

It is therefore important to understand what individuals think in order to accurately define what that context is. In their research, Premeaux and Bedeian (2003, p.1538) state that "…by identifying antecedents that influence employees' speaking up behavior, and by understanding

the process by which the decision about whether or not to do so is made" will lead to a better understanding of the silence/voice dilemma. Therefore, we consider the same of other actor's beliefs and perceptions within the same organizational context. Just as the individual actor has established an instinctual basis from which all acts of silence and voice flow, so have each of the other actors. It is through the more apparent intentional states and the resulting acts that each individual employee comes to understand, recognize and project the other actors' actions. We therefore examine how an employee comes to learn, know and develop the instincts required to successfully navigate the labyrinth of organizational culture and its many actors' behaviors.

On Silence and Voice

Morrison and Milliken's pivotal research in 2000 explored the limitations on pluralistic change and development characteristic of organizations rife with a "climate of silence." Since that time, managerial and organizational research on organizational voice and silence has received growing attention. In their work, Morrison and Milliken define a climate of silence as "one characterized by two shared beliefs: (1) speaking up about problems in the organization in not worth the effort, and (2) voicing one's opinions and concerns is dangerous" (p.714). Morrison and Milliken's exploration of silence and voice in the organization positions voice as a positive agent of change and silence as a barrier to change. Van Dyne et al's (2003) research takes an opposing view of silence and voice, and introduces a conceptual framework whereby silence and voice are "separate, multi-dimensional constructs." They break silence and voice up into three motivational categories: acquiescent silence and voice, defensive silence and voice, and pro-social silence and voice. The framework we use builds upon this important multi-dimensionality of silence and voice while paying closer attention to silence itself as a sometimes pre-intentional and other times intentional act (versus a state of being). Knowing theory specifically informs our analysis by providing a set of identifiable constructs that are assumed to be a part of the fabric composing the knowledge at a given place and point in time. While it is simplified, the assumption and centrality of a more gestalt view of knowing helps frame our discussion of that same geometry between active, concurrently enacted silence and voice within an organization.

Knowing, Silence and Voice: A Conceptual Framework

Knowing is commonly conceived of as tacit when it is unvoiced and is conceived of as more tacit the greater the difficulty in voicing such knowing. The same type of understanding is generally believed to be explicit when it is voiced and is, conversely, commonly assumed to be more explicit the greater the ease with such knowing is voiced. Less commonly understood in organizational knowledge literature is the idea that explicit and tacit (Polanyi, 1958) are inextricably tied to one-another. As a few Polanyian scholars point out (Prosch 1986; Sanders

1988; Jha 2002), Polanyi did not discuss the explicit in his tacit knowing theory, but he does not disavow explicit knowledge's importance and ubiquity. The personal contexts (e.g., physiology, mental stances, moods, and attitudes) as well as the organizational contexts (e.g., macro and micro culture, divisional rules, interpersonal relationships, organizational structure) all influence the generation of meaning. Competing conceptualizations lead us to generate the written and spoken word, which we recognize as one form of voice. But the generation of meaning also leads to the generation of words that remain contained within individuals or groups. We refer to the absence, withholding, suspension, suppression, and omission of voice – whether individually or collectively as a group - as silence. We also adopt tacit knowing's important assumption that acts of silence and acts of voice are represented explicitly in a form rooted to a large pre-intentional and intentional tacit knowledge context. Silence and voice acts therefore represent, to a greater or lesser extent, the greater body or bodies of tacit knowledge that enable their expression.

Silence may therefore result when something is known and not transferred, known but not well-known or articulable, and/or known but not consciously known (or a combination of these states). Likewise, voice may be known and shared, known but not well articulated, or even articulated without being consciously known, to draw some parallels.

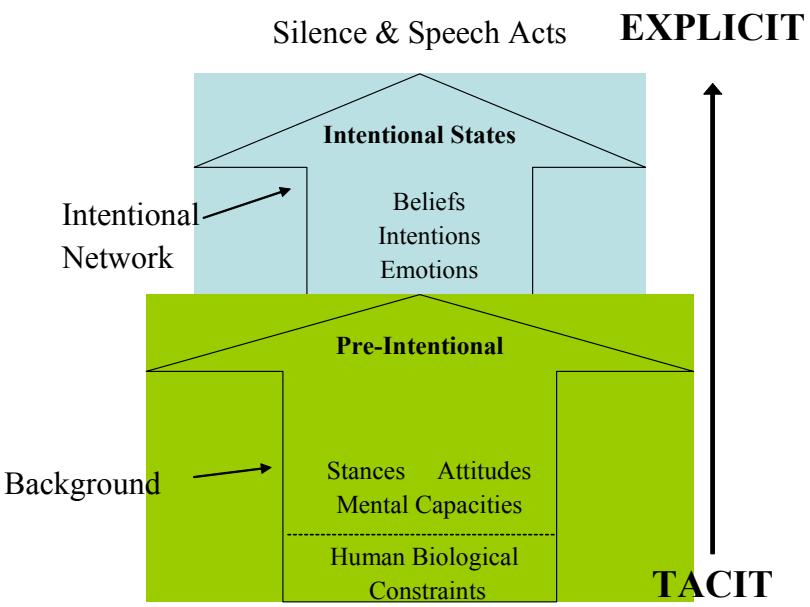

Figure 1. *Tacit to Explicit Schema*

Giving voice to privy or proprietary organizational information to the inappropriate recipient or audience can result in a weakened strategic or competitive position for the organization. Knowing does not guarantee that the knowledge is either accurate or relevant. Perhaps the reason to voice the knowledge is to fulfill a personal need. Furthermore, who is the recipient of the knowledge? Is it appropriate for this entity to have this information? The information may be contrived, incomplete, embellished or deduced from physical cues pasted together to create a story. One must ask what the perspective of 1) the knowledge-source is and, 2) the recipient of that knowledge? Likewise with silence, a trade secret and its keeping are defined with greater and lesser accuracy in relation to various environmental actors, serving in different roles and capacities, within sometimes multiple environments. Silence also depends upon the perspective, the validity of the information, the beliefs, intentions and emotions of the person or persons behind the enactment of silence. Any trade secret has the potential to depreciate entirely if the secret remains privy to only one individual and that individual cannot act or fails to act in its eventual sharing. A secret is therefore valuable dependent upon how it is kept silent and how it is voiced, especially with respect to various contexts (e.g., physical, temporal, and social).

The underlying and immense base of tacit knowledge is precisely that context that supports pre-intentional and intentional silence and voice acts, analogous to the base of a large pyramid. Explicit actions (e.g., speaking, writing, gesturing, remaining silent, withholding voice…and timing their respective use) emerge imperfectly after filtering through first pre-intentional states. Then they percolate up through more intentional states leading to voice acts, represented in Figure 1.

As the figure depicts, pre-intentional states overlap with intentional states because stances and attitudes may be less or more intentional. An individual may hold and exhibit an attitude without knowing or that attitude may possess aspects that have been made quite explicit. This is true of everything listed within the individual's intentional network. Beliefs, intentions, and emotions are among (but are not comprehensive of) other aspects of the intentional network we know best as the expression of voice and not so well as the exercise of silence. Similarly, stances, attitudes, mental capacity and other physiological constraints and, finally, those limitations imposed by the unique condition of being human are not so well known to voice. But they are more easily associated with silence because they are more difficult to express. That is, they do not as easily lend their understanding and defy the exercise of voice. Figure 1's schema suggests that the origins of all acts of voice and silence are embedded in the intentional net, which originates from an individual's pre-intentional net. We start our discussion with these origins.

Pre-intentional Silence and Voice

According to the Dictionary of Psychology, an attitude is "some internal affective orientation that would explain the actions of a person" (Reber and Reber 2001). Stances are,

described using similar terms, an orientation or predisposition toward a class of attitudes, emotions, intentions, and beliefs. A stance therefore identifies a *network* of pre-intentional and intentional factors that could be used to predict or explain actions. Reber and Reber go on to state that the affective orientation of attitude can be 1) cognitive, or "a consciously held belief or opinion", 2) affective or an "emotional tone or meaning", 3) evaluative or "positive or negative", and 4) conative or a "disposition for action" (p.63). While attitude and stance almost appear to be defined by one-another, attitude seems to be geared toward explaining behavior and, thus, created with relation to a very specific outcome. Stances, on the other hand, are dispositional states composed of a network of inputs, which include attitude. Lesser and Prusak (Prusak 2001) comment that layoffs may encourage the overt or unconscious withholding of knowledge, when employees feel that an implicit social contract has been broken. The implicit social contract is, itself, an indicator of a stance accepted by the employee. The conscious withholding of knowledge may arise from the evaluative attitude that the organization has become hostile to the individual. The unconscious withholding of knowledge, likewise, may occur because the conative attitude toward accomplishment within the organization has disappeared. Van Dyne, Ang et al. (2003) identify an actor's motivation "to withhold versus express ideas, information, and opinions about work related improvements…" (p.1360), indicative of a cognitive attitude concerning the information's relevance.

In Van Dyne et al's (2003) reference to beneficial silence, such a categorization requires the existence of an attitudinal stance that includes a network of simultaneously cognitive and evaluative attitude (this nested within the beneficial term) and their predisposition not to share proprietary information and trade secrets (p.1364), a conative disposition toward, in this case, inaction. The Premeaux and Bedeian (2003) article, alternatively, combines trust, which is an affective and evaluative attitude, with top management's openness to communications from below. This openness to communication may be more of a stance, but could also include the conative attitude that facilitates communications from below (Bowen and Blackmon 2003; Creed 2003). Openness to communication is also likely affected by the perceived importance of an issue. This perception is likely influenced by a network of cognitive, affective, and evaluative attitudes (i.e., a stance) because importance is often a consciously held belief (i.e., cognitive attitude), concerning the issue's level of relevance (i.e., evaluative attitude), as well as – especially with extreme lows and highs - the issue's affective importance (affective attitude).

Morrison and Milliken's research (2000) references the importance of an employee's cognitive map, or thought process, in making choices about conducting acts of silence and voice based upon external and collective belief systems. We agree that external stimuli, like organizational culture and beliefs of other actors have great influence upon an actor's choice when employing silence and/or voice. However, we argue that these external forces are secondary to the internal forces that shape an individual's personal beliefs, intentions and emotions in the decisive use of silence and voice. Therefore, we suggest that an individual's

pre-intentional states, which serve as the origin of their intentional states, act as a more exacting predictive and explanatory tool of silence and voice behaviors. The tacitness schema underscores the importance of pre-intentional items as the innermost prevailing condition impacting an individual's perceptions, interpretations, and understanding of their organizational reality. It is again helpful to reassert that the two assumptions rooted in tacit knowing theory guide our understanding of silence and voice. First, the tacit to explicit relationship anticipates that the network of pre-intentional factors, even though they are apparently less malleable, exert different influence in different contexts based upon the total overall state of the individual in question. More noteworthy is the assumption that everything voiced or silent and within the realm of intentional factors must be tied to factors that precede them at the pre-intentional level. This means that nothing expressed, otherwise communicated, or achieved which is made explicit exists without origins in and extant ties to a body of tacit knowledge – represented here in terms of more or less pre-intentional or intentional factors.

Another important class of pre-intentional factors includes the personal, difficult-to-change, and primarily intrinsic mental and physiological capacities possessed by individuals exercising voice and silence. These include things like general cognitive ability (LePine 2003), social ability or other predisposition that often drive social life for people with depression, anxiety, or other psychological disorders. These more physiological factors set limits to call other-oriented behavior (Van Dyne, Ang et al. 2003) and other social intelligence (Fiske and Taylor 1984). It is reasonable to expect that higher social intelligence will relate to multiple perspectives including greater consideration of their social roles (Melone 1994; Van Dyne and LePine 1998), referents (Katz and Hass 1988), shared group cognition (Larson and Christensen 1993). In the layoff example above, the perceived breach of social agreement weakens and severs many employee/organization ties. However, an employee with a strong sense of loyalty to the company, or to a work ethic, or to a belief that adequate compensation for knowledge requested has already been supplied. Additionally, the employee may feel a sense of loyalty not to the organization but, rather, to a group within the organization (Hollenbeck, Ilgen et al. 1998) dependent upon knowledge held in the employee's possession (Liang, Moreland et al. 1995). This may elicit additional sharing even though a contradictory sense of anger, victimization, or sadness (Tiedens 2001) is felt for the group's parent organization. An individual may use knowledge and voice with a small, familiar group while silence and selective withholding is enacted between the individual and the parent company. Morrison and Milliken (2000) suggest that an actor may be motivated by the preservation of the relationship, in this case with the small working group, while withholding voice or engaging in silence that provides a "what they don't know won't hurt them," or "what they don't know won't hurt me (or us)" rationale. This could ostensibly include silencing cognitive and attitudinal dissent (Graham 1986), perhaps for the sake of an important set of relationships (Morrison and Milliken 2000), racial identification or ambivalence (Thoits 1991), or heightened ethical awareness (Litz 1996).

Personality is generally viewed as a stable individual trait composed of characteristics, some of which were mentioned, alluded to, or related to variables listed above. Personality is explanatory and predictive of voice and voice's absence (Avery 2003; LePine 2003). However, little has been done concerning silence and voice's multidimensionality, nor have silence and voice often been considered potentially complementary behaviors. We borrow Barrick and Mount's (1991) thorough meta-analytical review of the personality literature. Without restating or reiterating too much, because it is beyond the scope and length restraints of the paper, we do use aspects of the Big 5 Personality Traits (i.e., extraversion, neuroticism, agreeableness, conscientiousness, and openness to experience) to provide some idea of the importance of psychological characteristics with respect to the knowing schema. For example, Barrick and Mount (1991) describe extraversion as relating to "sociable, gregarious, talkative, and active" traits (p.3). The active trait, seen as a fairly stable individual state, is even more intrinsically pre-intentional than an attitude or stance. Somebody described as being active would also be predicted to the conative attitude above and would also be expected to hold stances that were more ambitious in scope and perhaps more complex as well. Likewise, somebody frequently engaged in self-monitoring behavior (Gangestad and Snyder 2000; Premeaux and Bedeian 2003), which is more intentional, would also be less likely to exhibit sociable and expressive traits indicative of an extraverted personality, which is more pre-intentional. Thus, intentional clues can be used to indicate the presence of less obvious, more pre-intentional factors and can even aid in their early identification.

The second personality factor, neuroticism, is also sometimes called emotional stability, stability, or emotionality (Barrick and Mount 1991, p.4). This factor is more closely tied to the affective attitude mentioned above and are commonly associated with anxious, depressed, emotional, and insecure behavior, just to name a few. Again, persons exhibiting such behaviors are more likely to express intentionally – through voice and silence acts – clues that indicate the presence of the neuroticism personality factor. These may be tied to other pre-intentional factors like the holding of many negatively skewed stances. Also, somebody possessing a neurotic personality would more likely tend toward negative affective attitudes as well as evaluative attitudes. Some authors point out that the sharing of personal and introspective information (Bowen and Blackmon 2003; Creed 2003) is often a critical predecessor to enacting voice (and silence). Somebody with difficulties in this personality characteristic would likely have a difficult time "sharing" and so might also inadvertently express a negative silence versus one that has greater positive potential.

While much time could be given to a discussion on personality or on the Big Five alone, the ties of the remaining three factors (i.e., agreeableness, conscientiousness, and openness to experience) must be discussed in greater detail in some other paper. Their descriptions, however, may be helpful in identifying their basic place in the tacit knowing schema. Agreeableness is often associated with likeability, friendliness, and sociability as well as more intentional exhibitions of flexibility, trust, cooperation, forgiveness, and tolerance (Barrick and Mount 1991, p.4). Conscientiousness is tied to conscience, conformity, dependability, and

will to achieve. Persons with this type of personality are associated with behaviors described as hardworking, achievement-oriented, and persevering and are likely to demonstrate evidence of personal feelings of competence, capacity for self-discipline, and stances related to order, sense of duty, commitment, and perseverance. Finally, openness to experience is associated with imaginativeness, curiosity, and intellect. Persons with this characteristic are often described as "imaginative, cultured, curious, original, broad-minded, intelligent, and artistically sensitive" (LePine 2003, p.29). People who are open to experience enjoy intellectual problems, which signify both positive affective and conscious cognitive attitudes. They are also more willing to try new things (McCrae 1987, Kuncel, 2004 #776), which is indicative of a flexible and adaptive stance.

Of course, personality is an indicator of human biological constraints, the last pre-intentional factor, which is also referred to by Reber and Reber as the "physiological limit" (Reber and Reber 2001) or the upper limit of performance dictated by biological factors (e.g., intelligence, drive, neurological processes). These include mental capacities that can be reflective of levels of intelligence, thought, rationality, and "pertaining (broadly) to all those operations subsumed under the label cognitive" (Reber and Reber 2001). This is, obviously, a determinant of the last Big Five Personality Factor and tied similarly to all more intentional or implicit factors from the tacit knowing schema.

Intentional Silence and Voice

The first factor in intentional silence and voice is belief. Reber and Reber (2001) define beliefs as being generally used in the standard dictionary sense of an emotional acceptance of some proposition, statement or doctrine." We suggest that an individual actor's beliefs with regard to him or herself, other actors and the organization have a direct bearing upon the actor's choice in using silence and voice. According to Morrison and Milliken (2003), "[t]he most frequently mentioned reason for remaining silent was the fear of being viewed or labeled negatively, and as a consequence, damaging valued relationships" (Milliken et al 2003, p.1453). In addition, Van Dyne, et al (2003) suggest that both silence and voice are defined best by an actor's motivation to withhold versus express ideas, information and opinions (p.1360). Fear as a motivational factor is based upon an individual's belief that using voice in certain situations will result in an unfavorable outcome.

In forming beliefs, Baker and Jones (1996) suggest that organizational myths create implicit rules with regard to keeping silent. Milliken et al (2003) are in agreement stating, "employees learn to remain silent, at least in part, from talking with and observing peers" (p.1466). Belief in organizational myths or from direct experiences can condition an actor to believe that silence is an acceptable, perhaps even necessary behavior that will preserve or benefit his or her career in the long run.

The second construct is that of intention. According to Reber and Reber (2001), "the term [intentional] is used by most with the connotation that such striving is conscious." In addition,

they define intention as "any desire, plan, purpose, aim or belief that is oriented towards some goal, some end state". Acts of silence and voice can have a specific intent, particularly in an organizational setting where an individual is judged based primarily upon the value of his or her inputs and outputs. In this respect, an actor to project a desired image to others within the organization can manipulate the use of silence and voice. In their paper, Van Dyne et al (2003) make the point that "…employee behaviors at work are regularly interpreted by co-workers, supervisors and subordinates" (p.1374). Therefore, the knowing employee would be motivated to behave in ways that align his or her desires with regard to the organization. By using silence and voice purposively and with conscious intent, an actor can position him or herself in a way that aligns with the overall expectations of others. This is akin to self-monitoring or being conscious of "the extent to which people observe, regulate, and control the public appearances of self that they display in interpersonal relationships" (Gangestad and Snyder 2000; Premeaux and Bedeian 2003). Additionally researchers point out the importance of management's openness to communication (Premeaux and Bedeian 2003), which sets the overall tone with regard to communication within the organization.

Milliken et al's study revealed "employees may choose to remain silent about issues if they conclude that the context is unfavorable" (p.1455). This supports the strategic and intentional use of silence. Van Dyne et al observed that "[w]hen speech does not occur, the absence of behavior is not particularly obvious and does not attract attention" (2003, p.1364). However, this does not always hold true. The obviousness of the act of silence is greatly dependent upon the other situational actors and their familiarity, or intimacy level, with the individual actor. Therefore, an act of silence, especially when not expected, wields significant power and can be as apparent an act as that of voice.

Accordingly, the ontology of voice and silence dictates that both vary across group identities and change with perspective. Unlike detrimental silence, which intentionally withholds relevant information for a devious purposes, beneficial silence like Van Dyne et al's construct of pro-social silence, is also "strategic and proactive – conscious, purposeful, and intentional – such as when employees protect confidential information by withholding it from others" (Van Dyne et al, 2003, p.1365). We add to this research by suggesting that beneficial silence result from the intent to protect oneself, as well as others from undesirable involvement and situations, and serving as proof of one's loyalty to others and/or the organization when one is "in the know."

The final construct we address is that of emotionality. According to Reber and Reber (2001) emotional states are normally acute, relatively short-term, and momentarily motivating. They are generally regarded as intensely experienced states that are frequently disorganized and widely seen as "evolutionarily determined" and reflective of "species-specific survival strategies." In addition, emotional states "…tend to be non-habitual and to result from particular constraints of an environment" (pp.236-237). Tiedens and Linton (2001) consider emotions to be a cognitive appraisal or the personal significance of an event (Tiedens and Linton 2001).

Emotions can have a profound effect upon the use of silence and voice and is possibly the most explicit form of knowing within the proposed framework. Van Dyne et al (2003) state that with regard to covert behaviors "thoughts and feelings are not visible to observers" (p.1375). However, emotionally charged silence and voice actions that are not tempered or controlled can make apparent the thoughts and feelings of an actor. The emotion of fear has been placed at the center of research regarding the use of voice and silence and the resulting behavior.

Commenting upon the work of W.E. Douglas Creed, which explored the use of voice and silence among gay and lesbian Protestant ministers, Morrison and Milliken (2003) observe, "one can see the pain associated with silencing core aspects of one's identity, yet at the same time, the pain and risk associated with voicing" (2003, p.1357). In this situation, voice, while personally liberating, could result in the loss of actor's credibility to perform the functions of his or her calling. However, to remain silent was to in essence live a lie. Choosing between the option of silence and voice can be an emotionally crippling experience.

A study conducted by Morrison and Milliken (2000) suggests "if an individual is fearful about speaking up, he or she will be more likely to think of information that confirms this fear, and as a result, form exaggerated conclusions about the dangers of voice (pp.1468-1469). While we agree that this condition may lead to an act of detrimental silence for the actor, other actors and/or the organization through the withholding of relevant information, we believe that it can also act as a form of beneficial silence, since the actor may be better served by not expressing his or her opinion while in an emotional state, thereby avoiding a potentially embarrassing situation that could result in an indelible and unfavorable impression. Therefore, opting to remain silent to conceal one's emotions may be detrimental, but the benefits of doing so may be the wiser choice in the short and long run.

Implications

The implications of our research are numerous and multi-faceted. With the exception of biological constraints, which are predetermined, each individual actor's experiences forms the basis – or pre-intentional basis of mental capacity, stances and attitudes - which flavors the content of his or her production of silence and voice personality. Memorable experiences can impact this state, allowing for dynamic shifts in stances and attitudes. When strongly impacted, both attitudes and stances can become static and automatic in response to seemingly familiar stimuli. Therefore, it is beneficial to understand that each and every actor comes into an organization (or any new environment) carrying very specific personality traits that are made apparent through actions and reactions to other actors, the organization, and microclimates.

Our research extends the previous work on silence and voice and suggests that through a better understanding of (1) the cognitive processes that affect an individual employee's choice in the use of silence and voice, (2) the overarching organizational culture in which the actor

functions, as well as (3) the various shifting microclimates that frame the choice, management can develop a more acute awareness about what is and is not being said and why.

We have introduced two overarching categories of silence and voice – beneficial and detrimental - into which any act of silence and voice can be placed. These four constructs: beneficial silence, beneficial voice, detrimental silence and detrimental voice may occur simultaneously. They are also dependent upon the actor's perspective (Kilduff 1990 Shah, 1998 #67; Gioia, Thomas et al. 1994; Melone 1994 Corner, 1994 #349), referents (Melone 1994; Boyd 1995; Shah 1998; Warren 2003), and perceptions regarding the specific circumstances (e.g., context, timing). The tacit to explicit schema may then serve as a framework upon which to compile what is known about the actor's pre-intentional and intentional states. Because it is more likely that information about silence and voice will be evident with more intentional factors (e.g., emotions, intentions and beliefs) it is also more likely that such evidence will be found. However, baring more explicit forms of evidence, the knowing environment used to evaluate silence and voice's capacity as a force for organizational change can be assessed using only pre-intentional factors.

While organizational culture is slow to change, microclimates within the organization can shift and change with every new set of organizational circumstances and actors. Instantaneous reactions are required more often than not, which implies that making choices about what one says or does not say is a consistent necessity. Individual reactions, while they can be programmed to some degree, need to adjust along with these shifting microclimates and actors. An actor may find that by becoming chameleon-like using silence and voice is an effective strategy that achieves a future desired state.

We further suggest that beneficial silence is a strategic act that is as powerful, and perhaps more effective, than that of beneficial voice. A pervasive climate of silence, as defined by (Morrison and Milliken 2000), is an indicator of need for radical cultural change within an organization, and that only management has the ability to effect such change. However, we suggest that, because management is not immune to these conditions and circumstances, they must also be capable of reprogramming their own contextual and tacit knowing mix. In fact, with proper planning, implementation, and review, management may be capable of bringing silence and voice into a more intentional and strategically aligned state of awareness.

Implications for Future Research

Microclimates come in a variety of forms. Further exploration of the types and causes of microclimates would allow for a better understanding of actors' use of silence and voice – i.e. – an actor within a functional unit may be bound by the microclimate of that unit and experience it as a macroclimate, thereby containing and controlling the reach of the actor's voice.

This makes predicting acts of Silence and Voice difficult, other than through the use of wide categories about individual behavior and narrow contexts.

Both Beneficial and Detrimental Voice can be lost in informal communication channels because it is the only place that the actor feels his or her inputs have value and are heard.

In addition, our research suggests that pockets of silence are a more precise indicator of a prevailing microclimate, and that while management may be better situated to invoke organizational change, they too may be bound by relationships with other actors, organizational culture and microclimates.

The reach of an actor's voice can become stunted by any number of tacit or explicit boundaries – like functional unit, perceived or actual organizational social circles, hierarchical status within the organization, or personality of the self and/or others. For example, Cummings (1995) wrote that Pericles, a Greek strategist who died in a plague in 429 A.D., spoke with credibility not just because of what was said but, "to an Athenians way of thinking…restraint that, of all manifestations of power, impressed most of all" (p.25). It is with respect to what Pericles said and *did not say* within the social context of ancient Athens that made what he did say penetrate many of the logical and political boundaries of the day. (Milliken, Morrison et al. 2003) suggest that "employees must develop a cognitive map of an organization's communication norms…what one can and cannot say" and its consequences (p.1456). Alternatively, knowing what one should and should not say, when one should vocal or silent restraint (i.e., the timing of what is said and what is not) becomes an important skill that is developed by individuals with respect to the various contexts within which they operate.

However, what may be a beneficial behavior for the actor may not be beneficial to either the organization or the other actors. This is a learned behavior: learned through direct experience (the actor is a situational player), indirect experience (the actor is situational witness), or through legend whereby the actor is a recipient of situation specific information. Learning the most acceptable delivery of silence and voice depends upon the evaluative perspectives and organizational norms shared by colleagues (Premeaux and Bedeian 2003). These perspectives lend insight into when fear or trust (Ryan and Oestreich 1998), anger or sadness (Tiedens 2001), or other difficult to understand emotional issues impede decision-making or dominate perception.

Instances of corporate corruption (Brief, Buttram et al. 2001) provide one example of detrimental voice & silence working together. In collaborative efforts to commit fraud, for example, rules are developed that prescribe what should and should not be said, stories are constructed, what to leave out of these creative narratives are important because of how they combine with what is shared. The big need here is for the concurrent balance of silence and voice, the origins of silence and voice including pre-intentional and intentional antecedents.

While authors have paid some attention to the processes that give rise to silence and voice acts, too little attention has been paid to these. Additionally, the benefits of silence, it's complexities, those factors that influence decisions leading to voice or silence acts or, importantly, the timing of both in conjunction with one-another deserves greater attention.

Silence can be viewed as an active accomplishment versus an unintentional veneer of passivity (Bell, Meyerson et al. 2003)

In accordance with (Premeaux and Bedeian 2003, p.1560), we advocate greater specification as to whether speaking up or voice are the intended focus of research. We add to this by asking for such specification in silence. Is the intended focus of research silence as the withholding of voice or its absence, suspension, suppression, or omission? In addition, active voice and silence in management should be expanded beyond the individually and organizational units of analysis to include various groups within the organization, various organizational contexts (which we informally call microclimates). The confluence of individual and organizational factors and the assumptions imposed by the tacit to explicit schema, including the combination of pre-intentional/intentional factors, demand a simultaneous and multidimensional look at silence and voice. It is this more holistic look at both, we believe, that will help uncover instances when such communication is helpful or detrimental to long-term organizational performance.

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Endnotes

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Organisational Learning: An arena of many voices

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Abstract

In this paper, I introduce an understanding of organisational learning as "an arena of many voices" through notions of organisations consisting of social worlds made up by different commitments to organisational activities, and an understanding of learning and organisational learning as triggered by uncertainties. The case around which the argument is made is the development of digital administration in a local municipality in Denmark. Here, I show that it is possible to view organisational voices as tensions that open up and/or close towards organisational learning. That is, tensions can be viewed as reaching out towards or shying away from each other. The inherent assumption is that in order for tensions to be openings there must be some way of bridging the gap, there must be some sort of communality in order to explore the tension for example by way of joint organisational inquiry or critical thinking.

Introduction

Why keep grappling with definitions of organisational learning? Are there not sufficient definitions already to choose from? The answer is both yes and no. "Yes2, because there is a range of theories and models of organisational learning (see e.g. the two recent Handbooks on the field, Dierkes, Antal, Child, & Nonaka, 2001; Easterby-Smith & Lyles, 2003). "No", because there is still a need to define and understand organisational learning that reflects the complexity of both "organisation" and "learning" - at the same time. And furthermore, there is still a need to develop an understanding of organisational learning that it is possible to use as a foundation for research designs and possibly also to act as a basis for developing guidelines for future practices (i.e. interventions to further organisational learning activities). So, the intention with this paper is first to develop a line of reasoning that reflects both organisation and learning as complex phenomena viewed alone and together. Secondly, it is to present a way of dealing with this complexity through an empirical study and to provide some possible guidelines for future actions reflecting this complexity.

In the paper, I will first present the understandings of organisational learning that is both my point of departure and which I depart from (it would not have been possible to develop my understanding of organisational learning without these other understandings, they need each other, so to speak). These points of departure are what I in another paper have called the "first" and the "second way" of organisational learning (Elkjaer, 2004). The first way has its focus upon the individual as the learner in an organisational learning system whereas the second way is a negation of this first way and directs its attention towards the access and participation patterns in organisations understood as communities of practice. The way introduced here, the "third way", if you like, or a pragmatic understanding of organisational learning, concentrates on the organisation as an arena consisting of social worlds made up by commitments to - or engagement in - organisational activities. Learning is driven by the felt

(emotions are important) need to dissolve uncertainty into certainty by way of critical thinking (another term for inquiry but a term accentuating thinking, ideas, concepts and theories as tools for problem definition and solving). The individual and the organisation, the subject and the social worlds are co-constructed but not in any *a priori* way but around the empirically defined organisational activities. Entering an organisation with the intention of researching into organisational learning, I expect to find a world full of differences created by different commitments and tensions because these commitments are driven by engagement in different organisational activities - and also tensions due to access - or no access - to participate in certain organisational activities. So, what I try to do is to take some ideas from the first way (thinking and cognition) and from the second way (patterns of access and participation) and add commitment as well as tensions as the necessary prerequisite for learning.

Next, I present an empirical study in which I have followed an organisational development process in a local municipality in which the aim was to change into a digital administration. Here, I try to discriminate different social worlds by way of different commitments to parts of this organisational changing. I have done this by being an observer in a training programme aimed at creating change agents and also through interviewing a wide range of participants in the organisation. Some tensions are identified and I apply the terms "openings" and "closures" to grasp whether the different social worlds creating the tensions are able to reach out and potentially embrace each other or whether they are unbridgeable. The latter is very much a discussion of possible avenues for furthering organisational learning understood as an organisation in which tension between social worlds are needed in order to maintain a fruitful foundation for critical thinking and through that, new organisational activities and, in turn, learning. So, for me organisational learning needs the many voices in order to flourish. But now I am getting to my conclusion too fast.

The shoulders upon which I stand

Many years ago I made an interview with an American psychoanalyst and feminist, Dorothy Dinnerstein (Dinnerstein, 1976) who had made her work based upon a critique of Norman O. Brown's non-gendered work (Brown, 1959). She told me how angry she originally had been at the works of this colleague until it dawned on her that she could not have made her work had it not been for Brown. Dinnerstein learned through her inquiry (critical thinking) into her emotions (e.g. angriness) how academic work and the furthering hereof rest upon the shoulders of each other. And so it is for my work on organisational learning. Reading some of my older stuff I feel embarrassed about how angry it and its author (me) appear to be. Today I know that my work could not have been done without the seminal works of Chris Argyris and Donald Schön (Argyris & Schön, 1996), without the similar seminal works of Jean Lave and Etienne Wenger (Lave, 1988; Lave & Wenger, 1991), and without the works by many others (e.g. Cook & Yanow, 1993; Gherardi, Nicolini, & Odella,

1998). It is not possible to be different if there is not anything to differ from. So, the following is a brief introduction to the works upon which shoulders I stand - and also stand by.

Painted with bold strokes it is possible to view the field of organisational learning as adhering to an organisation not as sums of individuals (because few will today openly ascribe to this understanding) but as systems in which individuals are learning (the most prominent proponent of this understanding is of course the above mentioned works by Argyris and Schön, see e.g. Argyris & Schön, 1996). In this understanding learning is the detection and correction of errors solved by individuals' inquiry into surprises in organisations understood as learning systems made up by the channels for information as well as the organisational incentives for problem solving, which partly is made up by the degree of defensive and non-defensive communication in organisations. The crucial problem regarding learning is the transfer of learning outcome from the individual to the organisation even if individuals' inquiry is made on behalf of the organisation.

Another way to understand organisational learning is to view learning as the process of "legitimate peripheral participation in communities of practice" (Lave & Wenger, 1991), as "practice-based" processes of knowing in organisations (Gherardi, 2001; Nicolini, Gherardi, & Yanow, 2003). This understanding of organisational learning derives from a critique of learning as cognition, i.e. as discriminate processes of thinking taking place in specific institutions established to do so (e.g. schools). Learning is rather an unavoidable part of - or ubiquitous to - everyday life and work that unfolds around participation in communities of practice (e.g. in work organisations). The practice-based understanding of organisational learning is also a critique of the idea that individuals are the prime subjects of learning. In stead it is argued, learning takes place in and among participants, objects and artefacts (e.g. new concepts of management and organisations).

I think that both the above ways have much to offer the field of organisational learning but I also think that there are problems with both of them. In the Argyris and Schön understanding of organisational learning, there is an unresolved problem regarding the relation between the individual and the organisational. What is it to act on "behalf of the organisation"? Is that unambiguous or how is that to be understood? Also, I think that the transfer of learning from individual to organisation is a difficult concept to work from because what is transferred and how is it possible to make this transfer? In the Lave and Wenger (and subsequently Gherardi and Nicolini, Cook and Yanow) understanding, how is it possible to account for diversity in e.g. outcome of participation in communities of practice? We somehow need agency but not as pure and sole voluntarism - as if no organisational (power) "structures" were in existence. Also, is it possible to differentiate participation and socialisation from learning? Is learning a discriminate process?

I do not want to argue that there is a very sharp division between learning and socialisation as I see the two as integrated and related processes (this means that it is not possible to have one without the other). But from an educational - or interventionist - perspective, is it then possible to point to "triggers" of learning and to aspects of participation that are more directed

towards learning than to socialisation? Yes, I will argue, the triggers of learning are the meeting with uncertainty ("surprise"), which is first and foremost a felt, an emotional, situation. This meeting may or may not lead to learning. It is possible to stay in the emotional situation, so to speak, no matter whether it is in the good or bad sense. It is for example possible to enjoy a movie, a painting, a piece of music, sex, love, etc. But if learning is to occur, thinking by way of applying ideas (why is this thing so enjoyable?), concepts (e.g. genre, style) and theories (e.g. about bodies, emotions) as instruments for understanding, for more enriched understandings, and for the possibilities of bringing these enjoyments to happen again. The same goes for organisations. Participants are in a sense "thrown into" the organisation, which is in existence not to learn but in order to do some kind of concerted action (e.g. produce a product, sell a service, or both). Learning may or may not be a "side effect" or "side benefit" of work (see e.g. Marsick & Watkins, 1990) but some kind of critical thinking is needed to ground these side effects in organisational life and work, I argue. And I believe that it is the relation between participants and organisations that holds the key to understand organisational learning. It is to this issue I turn to now.

Arenas and social worlds

In an understanding of organisational learning as individuals' learning in organisational learning systems, it is possible to discriminate individuals on the one hand, and organisations by way of learning systems on the other. The two are connected because when individuals change, the organisational learning system change and possibly also vice versa (even if the organisational learning always begins with the individual in the understanding of Argyris and Schön). In organisational learning as participation in communities of practice, there is no conceptual separation of the two, individuals and organisations. The unit of analysis is the communities of practice, and the focus is upon newcomers' trajectories or movements into a position in the communities of practices. The term is not communities of practitioners but communities of practice thereby stressing community and practice and not individuals or professionals. Whereas one can talk about a causal relation between individuals and organisations in the first version of organisational learning (see also Altman & Rogoff, 1987), it is not possible to discriminate neither individuals nor organisations in the understanding of organisational learning resting upon learning as legitimate peripheral participation in communities of practice.

In a pragmatic understanding of the individual and the organisation, the subject-world relation (see also Lave, 1997), it is not possible to have one without the other but the relation is transactional, it is one of mutual constituency, so to speak (see also Emirbayer, 1997). This means that they change together and also "learn" together. But the way units, social worlds, are discriminated is through the engagement in organisational activities. I.e. there is some kind of voluntarism brought into the picture, a voluntarism, I argue, that allows us to understand why diversity in performance and outcome can be understood as not only

externally or related to organisational structures of power determining patterns of access and participation but also by way of different engagements, different feelings and emotions towards organisational activities. For me this is the beauty of the term "social worlds" - it holds both the organisational power structures and the subjects' (more or less) voluntary actions. Social worlds are defined as follows:

> *"Groups with shared commitments to certain activities, sharing resources of many kinds to achieve their goals, and building shared ideologies about how to go about their business."* (Clarke, 1991: 131).

In a social world perspective, there are "commitments", "goals" and "ideologies" that "belong" to somebody. There are not only "patterns of access and participation" even if that is also there. The social worlds understanding encompasses agency but not at the expense of organisational relations of power. Power relations are to be found in any history of organisational activities. There is always a before, during, and after in the course of organisational activities, and time as well as space will always shape that course (for an interesting account of the term "space" with relation to organisational learning, see also the works by Antonacopoulou, 2002). It is possible to elucidate this course or trajectory of organisational activities through identifying the conditions (e.g. what, who and how affected the activities) under which these activities unfolded.

Organisations as arenas made up by social worlds allows for identifying different commitments to organisational activities. It is, I argue, the tensions between these that may create avenues for questioning existing practices and for critical thinking and for reflection. So in the following, I turn to an empirical study in which I looked for different commitments to an organisational development project in order to be able to see tensions as openings and/or closures for organisational learning. First I will make a brief presentation of the case study and the story behind the study.

Digital administration in Middletown

The research cooperation with the municipality of Middletown began in the late summer of 2002 with the aim of investigating the municipal use of e-learning as a means to develop individual and organisational competencies as part of developing digital administration. The municipality of Middletown was just beginning to develop web-based teaching in the form of on-line examples of digitalised work processes that can be learned by working on self-instructed simulation cases. When the authority was contacted, they reported that the use of these web cases would, however, not be launched until at least a year later. However, another project was just being started, which had also been conceived as a contribution to digitalising administration, namely an "Ambassador Programme" with the aim of training individual change agents, i.e. to provide employees with the skills needed to become "Ambassadors" of digital administration. After a couple of meetings, it was agreed that it would be a good idea

to follow this educational programme in order to assess its value in promoting digital administration.

The Ambassador Programme was developed in collaboration with and managed by the local commercial college. The programme lasted 2-3 months (from the end of November 2002 to early February 2003). There were 16 participants, including 11 from Middletown. The programme comprised nine meeting days and five project workdays, and the whole programme was evaluated on the basis of the project the participants made during the course. At the introductory meetings between people from the local commercial college, the project leader and the research group, the Ambassador Programme was presented as a strategic educational concept intended to equip specially selected employees to function as Ambassadors of digital administration.

The observation period consisted of six meeting days and one project day. The observations were undertaken on the basis of an observation guide, which was in essence a check list for recording information about who was present, the physical environment and how the teaching actually went as well as the participants' reactions to it. As early as the first course day, it became clear that the programme in practice did not have the strategic importance intended. There were, for example, participants who felt they had been "dispatched" without really understanding the relevance of the course to their work. In addition, the management representatives who were to take part in the first course day and propose specific projects of relevance for digital administration failed to appear. This meant that projects participants worked on during the project work days were selected on the basis of the participants' own wishes and interests. It became clear later that this was not an optimal way of choosing topics, and it was also criticised by the management leaders who took part in the final evaluation day, when the participants presented the results of their project work.

The aim of the research project was never to evaluate single means like e.g. e-learning or the Ambassador Programme, which meant that the data collected were fairly widespread throughout the organisation. In the spring of 2003, the bulk of the interviews were conducted, including interviews with the chief executive and the five heads of administration plus a head of human resource development; three managers at head of department level, including the IT manager; and nine of those taking part in the Ambassador Programme, including the three who together make up the internal Task Force - a group established to coordinate the many projects initiated to promote digital administration in the local authority – as well as the head of the training division of the local commercial college. Later, in the spring of 2004 a pilot project on e-learning was observed and interviews were conducted with four participants, some of whom had also participated in the first round of interviews. In the late summer of 2004 additional interviews were conduction with four other employees, who had on request been pointed out as people who had not specifically benefited from the digital administration organisational development project.

A slightly different interview guide was used for management and for rank-and-file employees but in both cases I was interested in personal information (educational background

and previous job experience, reasons for having chosen to work for the local authority), information about work functions and about the individual's assessment of the importance (or lack thereof) of digital administration for his/her own job and for the organisation as a whole. For participants in the Ambassador programme, the interview guide also contained questions about reasons for taking part in the Ambassador Programme and an assessment of how it can contribute to promoting digital administration, while the questions to management about the Ambassador Programme and its potential for promoting digitalisation were of a more general nature.

All of the interviews lasted between thirty and sixty minutes and were recorded on tape and transcribed by a student assistant. A form of phenomenological text interpretation was carried out (Giorgi, 1975), involving reading through all the observation and interview texts in order to gain an overview of the individual interviews and of the interview material as a whole. Key themes were identified in the material and subsequently used in a thematic interpretation (Kvale, 1996) on the basis of the understanding of organisational tensions as potentially creating closures or openings for organisational learning. The validation of interpretations involves continuously questioning whether this actually provide answers to the research question of whether it is possible to identify different organisational commitments to the organisational development project of creating a digital administration, and in what way tensions were created as openings and closures toward each other and, thus, paved a way for organisational learning understood as triggered by uncertainties.

In the following, I present six examples of organisational tensions created by different organisational commitments. I interpret the first three as closures to organisational learning as the tensions appeared difficult to bridge and, thus, to be able to both live, so to speak. The last three appeared more promising but they could turn out the opposite. First, I introduce the trajectory through which Middletown saw itself as gradually appearing as a digital administration. The chief executive in Middletown primarily tells this story.

From an industrial municipality to a digitalised one

Middletown is often thought of as one of the "spearhead" municipalities in Denmark when it comes to information technology. Much of the credit for this is ascribed to Middletown's visionary chief executive (retired after the study was finalised). The historical background of Middletown is that it was an industrial municipality until the early 1980s, when it had to change its course because of the closure of a major workplace. Efforts were focused both on turning Middletown into a commercial town - a goal that has been achieved - but also on developing information technology in the local municipality.

The development of digital administration in the municipality of Middletown was instigated as far back as 1991-92, with the aim of making it possible for citizens to go to one place with their problems and to deal with one case administrator, instead of having to present their case in many different administrative spheres, for example, the tax office, the school

system, social services, etc. "The Service Shop" (now called "The Service Centre") was established, and the strategy of digital administration was *"officially approved as early as 1995-96"* (IW-1M).[2] Thus, the foundation of digital administration was laid, and the characteristics of the division of labour were transformed from more specialised to more generalised knowledge and skills, enabling case administrators to deal with a wide range of citizens' problems.

The decisive factor in the chief executive's vision has been to ensure from the outset the recognition of the fact that information technology to a great extent has to do with people and with *"how people work together and function together"* (IW-1M). The chief executive's idea of organisational development is that *"developments must take place inside our heads"* (IW-1M) as power and financial incentives will fall short if a municipality is to develop.

However, not everyone in the municipality of Middletown agrees that the greatest obstacle to introducing digital administration is - at least, almost - entirely a "human problem". Some people think that a number of technical and legislation-related problems (e.g. the efficient use of a digital signature) prevent swift and efficient development of digital administration. They talk about systems that cannot communicate with each other, of information technology that is not well-functioning in everyday working life, and of the information technology department having been run by badly trained staff until quite recently. This creates a lack of belief in digitalisation being just around the corner.

> *"Well, the Achilles' heel when talking about information technology is that if we cannot diminish the gap between what we are really able to do, technically speaking, and what we would like to do, everything will lag behind"* (IW-4M).

Thus, both human and technical obstacles to digital administration are found in Middletown. These are not per se obstacles or closures to organisational learning in Middletown. In the following, I identify three examples of what I have termed "closures" towards organisational learning, these being different understandings of what development and organisational development are - and, naturally, also different understandings of the development project directed towards digital administration. The other closure is identified as the fear of cuts and redundancies, and the third is the mental fatigue towards yet another organisational development project.

Closures towards organisational learning

In this paper, organisational tensions creating an avenue for critical thinking or inquiry are viewed as a prerequisite for organisational learning. This follows from the pragmatic understanding of learning as being triggered by the encounter with uncertainty and from a social world understanding of organisations as made up by commitments to organisational activities. The expectation is that there will be elements of both closures and of openings and that these may - if kept alive - contribute to an organisational arena in which it is possible for

organisational learning to thrive. Therefore, examples of both closures and openings are presented in the following.

Closures of the organisational arena to critical thinking are illustrated by three different stories, the first of which illustrates the clash between two organisations, the project organisation and the line organisation, and is thus very much a story of different understandings of organisational development. The second story is about the closures that derive from the fear of cuts and redundancies, and, finally, the third story tells of earlier failed projects, which leads to a lack of energy for yet another organisational development project.

Digital administration and digital administration

In the municipality of Middletown it is possible to trace two conceptions of organisational development: the "long haul" versus "the many balls in the air" - some of which risk ending up on the floor. The former conception sees the emergence of projects as resulting from a planning phase and a subsequent implementation of the results (see also Austin & Bartunek, 2003). The latter conception is based on the understanding of organisations as being composed of many different people with ideas, and the belief that ideas can germinate at many different points in an organisation (see also Senge et al., 1999). One of the development-oriented mid-level managers says the following about this dilemma between the "project-efficient managers" and her way of seeing the value of working more *ad hoc* when it comes to development:

> *"If I try to understand them, it is because they have a different set of values, they have a professionalism as leaders that is highly implementation oriented and project efficient, (...) but at the same time, I would say that they have not clearly defined where the sector they are responsible for should be in five or ten years' time"* (IW-10ML).

In recognition of the fact that much development is already taking place in the local municipality of Middletown, many people at the managerial level as well as employees question whether there should actually be so much development in a local authority where there are problems involved in just getting operations to run efficiently. One manager says that the many projects that are launched can seem disruptive, for *"we have an operational organisation in which we also have to ensure that daily operations work smoothly, especially since we have citizens who require service"* (IW-4M). An employee responds in a similar way to the question of whether there is too great a tendency to have too many people involved in development and too few in operations:

> *"At any rate, there's something that indicates that attempts are made to move things, sometimes panicky attempts are made to start some development to make operations run smoothly"* (IW-18E).

A mid-level manager feels the same and would like to question *"whether we always have to be at the leading edge of everything, whether we ought to not initially concentrate efforts on making our operations second to none"* (IW-9ML). One manager ascribes the high level

of development to the charismatic nature of the municipal chief executive, who is felt to be the leader of an organisation that cannot quite keep up:

> *"In my view, we seem from the outside to have come far, thanks to a very strong and very technologically-oriented chief executive. But it reminds me a bit of Hagar the Horrible arriving with his troops and rushing forward to the fortified castle and attacking it, and when he gets to the bridge, his army is a couple of kilometres behind him"* (IW-7M).

Other employees point out that not everyone in the municipality of Middletown can keep up, which is essential if development is to be successful, because, as they say:

> *"You can't implement genuine organisation development, one that really works, without everyone from the most recently engaged trainee to the longest-serving boss agreeing on the path to be taken. (...) That was actually the case when we started The Service Shop. Everyone from top to bottom was in step (...), and a huge amount of development actually took place in no time at all"* (IW-15E).

The same employee emphasises the importance of following up words by action, for example, in connection with the drawing up of action plans: *"It's all got to do with trust, with having the experience that what is agreed on is what actually happens, e.g. in relation to management principles"* (IW-15E).

The two forms of organisation found in the municipality of Middletown, line and project organisation, thus, employ different forms of logic, which some people find potentially fruitful. As a mid-level manager says:

> *"Well, I often think if we only had the one or only had the other, what would be missing? (...) Line organisation ensures that everything is in order that the budgets are drawn up when they should be, etc. But sometimes line organisation produces inflexible roles for management or employees, which means that one does not get the optimal result out of a project organisation. If instead we only had the project organisation, it would (...) perhaps (...) be pretence in relation to what I see as a reality of something that has to work. (...) Maybe I see the clashes as actually being a path for action and interaction (...) as space for clashes"* (IW-10ML).

Others see this potentially constructive *"space for clashes"* as an expression of the fact that *"too many cooks spoil the broth"*, which makes it hard to get through with *"clear-cut messages"* (IW-3M) that are, according to this manager, necessary to make an organisation function as efficiently as possible. A ready response could be that in a public administration, for example, in a local authority, a line organisation is a well-known form of organisation, with familiar chains of command and a clear division of labour between management and employees. This does not apply to a project organisation, which is based more on professional expertise than traditional chains of command. It can be a problem for a project organisation, however, to ensure some form or other of learning from the projects, so that one does not have to start from the very beginning each time.

There are not just one or two understandings of what digital administration is, but many. The differences between them can partly be ascribed to how far the administrative area concerned has come with regard to digitalisation. The area of taxation is, for example, the

most fully digitalised administrative sphere. Also, the different areas of responsibilities play a role in the conception of digital administration. Thus, the person in charge of the economy holds a conception of digital administration based primarily on the fact that the administration has made a three-year agreement with the town council that entails fewer people in administration, while the same assignments are to be solved:

> *"(...) better than they are today, with more resources being released for assignments more closely linked to development - and demands are also being made regarding other competences. This is a hard readjustment process, also because we have many employees with many years' experience but not much education apart from basic office training, so it really means major readjustments"* (IW-2M).

For others, digital administration is a process that will hardly be completed by the end of the three-year agreement *"because developments don't stop simply because we have digitalised all our work routines"* (IW-12E). Efficiency and rationalisation will always have to take place in an organisation, both with and without new technological aids. What sort of a project, then, is the digitalisation of administration? One of the managers said:

> *"I first of all see digital administration as a sea of small projects. For me, digitalisation is not some large, gilded solution. I also believe it is important to remember that digital administration is not something we will have in two years' time (...) because we have to focus all the time on how we can make our work routines more efficient"* (IW-3M).

Apparently, an interesting schism exists between "vision" and "reality", as some people feel there is too much vision and too little "realised reality". In some cases, the project of developing digital administration is actually felt to be untrustworthy, making *"people lose energy"* (IW-4M). In other words, one should *"make sure that both feet are kept on the ground, so you don't get carried away by all the visions"* (IW-12E). This dilemma touches on the problem of defining and understanding organisational development and particularly the development of digital administration.

I regard this tension as that of closure but it does hold the potential of being one of opening up towards inquiry and critical thinking as there is some form of an awareness of the need for both understandings of organisational development and digital administration to be there. But the present climate is not for the discussions of that - maybe because there are fears of cuts and redundancies as well as certain weariness towards new projects in the municipality of Middletown.

Cuts and redundancies and a certain fatigue

The story of cuts and redundancies is also one of closure - one of insecurity and fear, which does not create openness towards organisational learning but rather the opposite. There is hardly anyone in the organisation who doubts that digitalisation of administration has to do with making operations more efficient and thereby being able to make do with less staff.

Nobody is likely to be against making his or her work more efficient, but people are afraid of losing their jobs:

> *"I can't imagine an employee saying, 'Hey, my job can be made, say, 10% easier, if we do this or that.' Nor can I imagine an employee saying, 'I can't be bothered.' We are all to a greater or lesser extent interested in doing our jobs as quickly and effectively as we can, and, of course, as well as we can. (...) But if people in addition to carrying out their jobs have to spend time changing their jobs, knowing all the time very well that what they are really working towards is firing themselves, well, then I think enthusiasm may start to flag"* (IW-15E).

People's opinions also vary with regard to how staff savings are to take place, for example, through normal attrition or definite dismissals and the hiring of better-qualified labour. There are also differences in the conception of the time frame for the development of digital administration, especially given the technical problems involved, as discussed above.

The reason why digital administration creates fears of cuts and redundancies is ascribed to how the project of digital administration was launched in the organisation. An employee says:

> *"What we have heard in the various departments about digital administration has been linked to the cutbacks it can lead to. But it would never be seen as a positive thing to throw people out on the streets, and it certainly wouldn't make anyone work very hard on a project, that's for sure"* (IW-15E).

There is a strong feeling - and apparently for good reasons - in the municipality of Middletown that digital administration is about rationalisation of work, cuts and redundancies. That this is also the case was shown earlier in an interview with one of the top-level managers who views the project of digital administration through the lenses of an agreement with the town council of fewer people in administration.

It is highly unlikely that it would ever be possible to launch a project that includes cuts and redundancies without creating this organisational fear and what is here termed closures towards organisational learning. However, maybe the feeling that the idea of digital administration is *"wildly exaggerated"* (IW-24E) exerts a pull in the other direction - towards openness of conditions or maybe towards indifference, which may be the worst enemy of organisational learning in organisations. What creates a draw towards closures and maybe indifference is the feeling that this is just another project in a long list of other failed projects. An employee says:

> *"If people or a group of employees have had the experience of being completely overwhelmed by a failed attempt at something or feel that something has been rammed down their throats without yielding any results, it is hard to rouse their enthusiasm again"* (IW-12E).

To sum up, illustrations have been presented here of closures of the organisational arena for organisational learning caused by differences in understandings of organisational development and of digital administration, the fear of cuts and redundancies and the desire to avoid repeating the experience of earlier failed projects and wasting time. In the following

section, three illustrations of what is here termed openings of the organisational arena for organisational learning are put forward.

Openings towards organisational learning

The three illustrations of openings - or partial openings - of the tensions that may pave the way for organisational learning first and foremost demonstrate the notion that organisational development and information technology per se create new possibilities; it is just a matter of reaching out and grasping the possibilities offered. Second, they show how the municipality of Middletown is open for citizens, which widens the perspective of the organisation, and third, they describe the creation and continuous development of the Service Centre, which allows citizens to obtain answers to their queries from one person, in one place and, thus, an opening of employees from specialists to generalists.

"Digitalisation is a gift"

The opening of the organisational arena towards organisational learning through the use of new technology and organisational development is clearly the aim of the executive director who says that *"the learning process that arises from being placed in a new environment with new possibilities is no short process – it takes time"* (IW-1M). He continues by saying:

> *"this situation does not only require management to create space (for development and learning, BE). This would not be sufficient. It only becomes sufficient when the individual is also prepared to help create the space or demand that it be created"* (IW-1M).

Also, one of the employees calls digitalisation "a gift, a challenge" (IW-12E). When it comes to e-learning as a tool, the notion is often expresses that it can be used during slack time in a working day. However, one of the employees most geared toward information technology and e-learning says that e-learning is not possible as there is no *"time when we can say that now we're going to do something else (other than our usual daily work, BE)"* (IW-14E).

So, the story of the opening of the organisational arena towards organisational learning due to technology and organisational development is very much also a matter of wanting to see it - and maybe of the experience of how a working day in the Service Centre is organised, with its lack of opportunities for doing anything other than regular work tasks.

Turning towards the outside world

Another story of an opening of the organisational arena towards organisational learning is the one derived from the opening of the organisation towards the outside world. In other words, thinking of work not in terms of clearly defined areas of expertise, but rather opening up and relating to citizens. One of the middle managers says:

> *"I think that the municipality should be thought of in relation to the citizen, and that we should be saying, 'What is it this type of citizen needs exactly?' Then we should adapt the organisation in relation to what the different types, pensioners, etc. really need. It (thinking along the lines of clearly defined areas of expertise, BE) is a silo way of thinking, as they say. We have to get rid of it and start thinking in new ways"* (IW-8ML).

Another middle manager puts it this way: *"As a municipality we are not just another service office. We also have a responsibility toward ensuring local citizens' well being"* (IW-10ML).

This way of thinking - not in clearly defined areas of expertise but rather, in relation to different types of citizens is a development that has taken place over a number of years. In one way, it is a "revolution", as it represents a paradigm shift away from organising knowledge and knowing in this kind of organisation into fields of expertise towards taking point of departure in different types of citizens. This I regard as a third example of a tension opening towards organisational learning but whether or not it does so, depends very much upon how the loss of the previous experience from the clearly defined areas of expertise is experienced.

The orientation towards citizens is reflected in the organisation of the Service Centre, but this part of the organisation is not viewed as an attractive one for all employees to work in as it requires generalists with all-round knowledge. Thus, an employee working in the Service Centre says that the Service Centre is not an especially attractive workplace as *"we work in such a broad field. There are so many things we need to be up-to-date about and to know off hand or at least find out where we can get help"* (IW-16E). The same employee says in a later interview that *"In future, we may be able to do everything in the Service Centre ourselves, because we will be able to go into the systems and help citizens or the citizens will be able to help themselves more"* (IW-16E).

Some people turn the loss of specialist knowledge into a problem, especially in relation to the in-service training of newcomers. If everybody is a generalist and oriented towards individual citizens, where will the specialist knowledge disappear? And is it possible to put all the knowledge into expert systems and then spread it out thinly among all the generalists?

These illustrations of openings of the organisational arena towards organisational learning - the "naturally" created openings of possibilities, the opening towards the citizens and the resulting development from specialists towards generalists can, like the illustrations of closure presented above, to some degree also be regarded as both openings and closures. Which each illustration is – an opening or a closure - may be highly dependent upon where one is placed in the organisation and from what standpoint organisational development and the changes are viewed. The point is that all illustrations are examples of openings and closures and that the development hereof may or may not be supported if there is awareness in the organisation of the need to keep and maintain tensions that give rise to uncertain situations, which may trigger inquiry and critical thinking and, in turn, lead to learning. However, this may depend upon whether it is possible to keep these tensions alive or not, which, in turn, depends upon

whether it is possible to see that both sides in a tension often will need each other through the need to differ from something.

Conclusion and discussion

The idea of applying an understanding of organisational learning as "an arena of many voices" is based upon a pragmatic understanding of learning defined as triggered by the meeting with uncertainties that may, in turn, be the trigger of inquiry or critical thinking, and also a pragmatic understanding of organisations as arenas consisting of social worlds made up by different commitments to organisational activities. The understandings of learning make a point out of differentiating socialisation from learning by way of thinking, i.e. through the use of ideas, concepts and theories applied as tools for understanding, for richer understandings and for the possibilities of bringing an experience about again (the notion of "transfer", if you like). This is not to say that there is no thinking in socialisation but to say that to discriminate learning through the notion of thinking is also an avenue for interventionist practices by way of joint or collective organisational critical thinking around the organisational tensions. I prefer the term critical thinking as opposed to the notion of reflection because it connotes that to inquire is to be critical of inexpedient organisational ideas and practices and also to be critical of one's own thinking whereas reflection can be just a "nice" process (although that is clearly not always the intention with reflection, see e.g. the works of Vince, 2002).

The understanding of organisations as that of social worlds made up by commitments is to remedy what I see as a lack of agency in the understanding of organisations as communities of practice and, thus, learning as access and participation patterns. This understanding, I argue, cannot help us account for different engagements and outcomes hereof. And it does not allow us to see and to value diversity in commitment and engagement. So, the understanding of organisations holds tensions as it holds the different engagements driven partly by emotions, and as such it may be aligned with the understanding of learning as the meeting with uncertainty.

The drawbacks of this understanding of organisational learning is that it may put and overemphasis on voluntarism and not see the "structurally" determined relations of power and influence. However, it allows us to see that the organisational tensions are created by different voices, which do not necessarily speak from a traditional management-employee divide but rather cut across the organisational arena. The different voices are related to commitment - access and participation - as well as possibilities for critical thinking or inquiry into meetings with uncertainties.

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Endnotes

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[2] 'IW-1M' means interview no. 1. M stands for "manager", ML for "mid-level manager", and E for "employees".

Designing a Knowledge Building Community

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Abstract

In this paper we describe the design process that has led us to the development of a knowledge building and sharing community for the personnel of the University of Siena.

The design process was iterative and co-evolutionary among three design components: user study, concept design, and theoretical framework.

Grounded on a shared vision, this design process allowed us to use principles and concepts of Constructionism to drive the design concepts and development of two elements: a system for the planning of institutional formative interventions and a conceptual community that build and share the knowledge of the organisation.

The process we describe shows how a co-evolutionary design approach can envision and guide the development of solutions that emphasize a tradition of user participation in design (participatory design) as a fundamental element. The solutions developed in this way have been seen to increase participants' motivation and to facilitate the diffusion of knowledge within a community. To this aim we describe the divergent and convergent phases of design (context analysis and concept generation). We present the QB mock-up, describing it in relation to the theoretical framework to which we refer. Finally, we report the testing of the QB mock-up in a pilot course in Bio-Informatics Software and in the realisation of the first full course designed using the QB method within the "Educational Plan for the Administrative and Technical Personnel of the University of Siena: 2004".

Introduction

Despite its relatively recent appearance in connection with e-learning, the concept of "designing for learning" is far from being a new idea. In a traditional context, many teachers and educators in general may consciously and reflectively engage in the process of learning design in a general sense when preparing a lesson schedule (even starting from some definition of user needs) or as part of everyday lesson planning. However, even when designing for learning occurs in connection with e-learning environments the design process is not carried out as an "interaction design" endeavour. In the following we present our attempt to design for learning, adopting the methods and practices of Interaction Design and, in particular, of the co-evolutionary design process [see Rizzo et al. 2003]. We adopted such an approach since in designing for learning we want to face the design of all the artefacts that mediate the learning activity: the contents, the timing, the Information and Communication Technologies (ICT), and the environments. In most of the cases, these artefacts are part of different design processes and teams. Furthermore, there are two fundamental drawbacks in educational practices that instead of being overcome by ICT technologies are amplified by them.

I) Most of the educational approaches and associated ICT still assume a world of independent individuals who "acquire" knowledge according to universal principles, tempered only by individual differences in aptitudes and abilities. However, the reality of classrooms and other learning groups is very different from this simplistic account. More salient than what is universal in human learning and development is the diversity that characterizes any class, school or group of learners, particularly as age increases. Not only do students/professionals differ in gender and ethnic and social background, in the language that they speak at home, and in their current levels of performance on educational tasks, but they also differ in espoused values, aspirations, interests, and experiences outside the learning environment. Learning theories and tools that fail to take this diversity into account provide little help for teachers who, themselves, differ in similar ways [Wells, 1999].

II) The co-construction of knowledge in the learning process is relegated to pre-established paths that follow an abstraction-instantiation loop. Most of our teaching is done through abstraction. Mostly we study a topic until we think we understand it, we abstract the general principles, and then we teach these general principles to students, usually through lectures. Afterwards, students learn the principles by trying to translate them to some practical reality, to some concrete lessons in their own heads, and then they struggle to put sense to this and to form their own abstractions. Things do not change a lot if you start with practical examples.

The pervasiveness of this educational practice makes it seem “natural” that the production of educational assets (i.e. slides, textbooks, case study, exercises) is done by one side of the educational process, the teacher. Only the teacher has the abstract knowledge and thus can start the production of educational asset. The students are completely excluded from the possibility to produce institutionalised educational assets, even when the theory goes that proper understanding is achieved only by co-construction of knowledge [Fusai et al., 2003].

In our approach, we have attempted to extend the design process we adopt in other contexts in order to construct a process of designing for learning.

The Co-evolutionary Design Approach Applied to Professional Training: Didà

At the beginning of the Didà design process, development of the method proceeded in three main strands, with designers working in parallel within three different Work Packages:

1. Analysis of the users and context: work conditions, formative needs, vision of professional training (WP2)
2. Study of theoretical frameworks for education (WP3)
3. Production of design concepts (WP4)

The team members involved in WP2 analysed the context, performing a capillary investigation of employees' needs with respect to their jobs and professional training. To collect these data, the team organized focus groups and conducted interviews with University of Siena employees at various levels. These sessions were then followed by the distribution of questionnaires in order to collect information on a larger scale.

Ten focus groups were organized in order to receive direct information from employees working in each of the ten main areas of the University. The instrument of the Focus Group was used for its capacity to allow issues to emerge in a collective and dialogical way. Discussion departs from real experiences of the participants in their own work context and evolves as the comment of one participant stimulates the comment of another. The method is effective for an initial exploration of context, as it "produces" a significant set of questions and dialogues, which allow designers to begin to understand the users and their needs. [Greenbaum and Kyng, 1991]

The results of these extensive focus group sessions consisted of a long list of needs and proposals related to work activities, structures, professional training, and communication.

The WP2 team used this information in the design of a questionnaire, which was necessary to widen the scope of the investigation, improve its accuracy, and ensure its relativity to all employees of the university. At the same time the team used some of the suggestions that had emerged from the focus groups to deepen the reflection on learning formats (WP3). The questionnaire layout and contents were further refined through user testing, which helped us to improve its usability and effectiveness.

	Role Playing Game
The element of “play” is traditionally considered in opposition to work activities (as an obstruction) Mixing game dynamics with professional training allows for a more enjoyable experience and helps to facilitate the employees' motivation According to this vision, it is possible to think of the formative process as a role playing game, with dynamic rules and exchangeable roles Augments recognition of others, because they become related to their roles, interaction, and the reaching of objectives.	
Key words	Enjoy Recognition Interaction Roles Reaching Objectives
Scenario	Mario, Annalisa and Cinzia are librarians in University of Siena. Mario (cataloguer) and Annalisa (assigned to the shelves) work in the libraries but they have different occupations, while Cinzia (cataloguer) has the same job as Mario, but in another library. Mario has to change the catalogue code of a book, but he doesn’t exactly know how to do it. Additionally, he doesn’t know were the book is located inside the library. If we fit this normal work situation into a role game setting, such as “The Lord of the Rings”, we can imagine that Mario and Cinzia could belong to the same “race” (i.e. the “cataloguer dwarves”), thus sharing the knowledge of their job and their category, while Annalisa (a hobbit) lives in the same village as Mario and thus shares the knowledge and rules of the place (the library). According to this representation, Mario could transform his problem into a game session, in which he could enjoy finding the best tools (wizard objects) and methods (action) to reach his objectives.
Links	Messieurs les enfants Domino Chess

Fig. 1. *Sample of a form describing the inspirational concepts*

At this phase of the project the anonymous questionnaire ensured the “honesty” of the users’ answers and permitted the collection of users’ opinions on more specific topics and questions than could be dealt with in a focus group [Dumas and Redish, 1993].

1060 paper questionnaires were distributed among all work areas of the university. 556 were returned, or 52.45%, which should be considered a good response rate [Baruch, 1999]. The results of these questionnaires indicated several problems perceived by the employees that can be divided into four main topics: communication, structures, knowledge and professional training, competences and procedures.

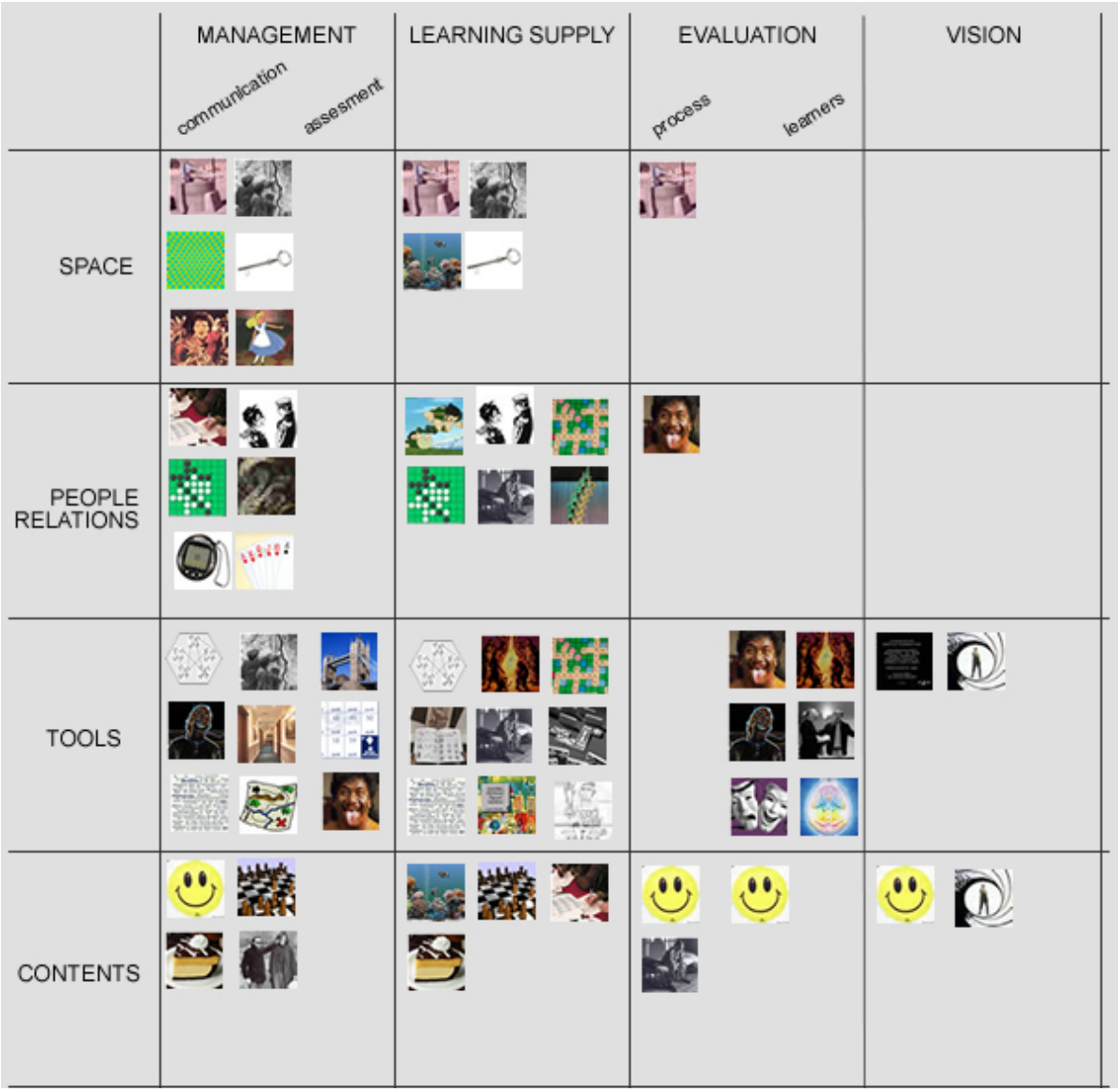

Fig. 2. *The matrix for mapping concepts*

The team also analysed the existing vision of learning and professional training at the University of Siena by interviewing some representatives of the three main "categories" involved in a professional training process at the university: the administration, the instructors, and the staff (represented by trade unions members). From these interviews the team was better able to understand the differences among them in order to develop some possible solutions for convergence of the various views.

At the same time the project's creative group (WP4) created a lot of inspirational concepts in divergence, that is, without being influenced by the results of focus groups, questionnaires and interviews. [Marti, Decortis, Rizzo, Moderini, Rutgers, 1999].

These first-generation concepts were each represented in a common format with a title, an evocative image, a brief description, some key-words, a scenario, and links to other concepts (Fig.1).

This representation allowed them to be compared more easily during the following phase of mapping and selection. In an intermediate convergent phase, teams from all three WPs worked together to map all the concepts into a matrix. On the Y-axis design factors: space, tools, people relations, and contents were inserted; on the X-axis, the four main topics emerged during the analysis of users and context conducted by WP2: management, learning supply, evaluation, vision (Fig.2)

This mapping permitted the team to see where the concepts overlapped, repeated, or lacked certain aspects with respect to the project objectives, which were gradually being refined.

After this first convergence activity, the three WPs continued to work in parallel:

- WP2 refined the formal and informal inquiry methods in order to regularly monitor the formative needs of University of Siena
- WP3 created a first paper mock-up of learning formats which could help instructors to have information on alternatives to traditional learning methods and edit them on the basis of their own teaching experience
- WP4 refined selected concepts

At the end of this project phase, the WPs passed through another convergent phase to match the results of the context analysis with users needs, producing a second selection of the concepts clustered in three main topics: training and assessment, communication, vision and community.

The selected 7 concepts were:

1. *The tailor* (training): formative process as a dress made to measure for the employees
2. *Marzullo* (training/assessment): "Ask yourself a question and give yourself the answer," the question that Gigi Marzullo, a famous Italian TV anchorman, asks to each of the guests on his show. The training process is a collaborative activity in which the employees answer their own questions. The assessment is related to the employee's willingness to share his new knowledge with others.
3. *Yellow Pages* (communication): communication based on people's needs and skills.
4. *Medusa* (communication): the organization "body" is transparent and allows the flow chart and skills distribution to be quickly seen inside it.
5. *Hotel* (communication): as in a hotel floor, some information is shared among everybody (the number of each room), while other information is private (closed inside the personal room) or strictly reserved (closed inside the strongbox). The knowledge flow has different levels of availability for each of the community actors, related to their roles and position (the administrator could have the *passepartout*)
6. *Prayer Tree* (vision/community): all the answers and questions are collected and (even visually) represent the knowledge of the community

7. *Linkiostro* (training/community): knowledge sharing even in informal (neutral) collective places of the University like gardens or cloisters. This will facilitate the sense of awareness of the community members (employees, teachers, students) and make the knowledge flow more "fluid"

These selections guided the design team to the prototyping phase along with another work package (WP5), which was dedicated to the study of technical solutions. During this session the creative concepts were synthesized into two primary mock-ups to be tested and developed:

1. The Question Based learning method (QB vers.1.0), an iterative formative system for the University of Siena based on questions produced by the community itself;
2. The Knowledge Tree (K3), a knowledge community which can easily collectively or cooperatively produce, edit and share contents. This community would act on two levels: the virtual interaction through a dedicated portal on the Web and the physical interaction in spaces specifically designed for supporting knowledge building and sharing.

According to this vision the QB mock-up can be considered the formal "soul" of the learning process, while K3 is the informal one, which extends the concept of learning toward the concept of a knowledge building community.

Theoretical Framework and Description of the QB Method

The concepts generated during the creative phase of the project express an important element of the project's vision: the centrality of the users. Thus, the participatory design methods, applied through the participation of users in the whole design process, constitute a fundamental element that seeks to increase participants' motivation and helps to facilitate the sharing of knowledge within a community.

The primary goal of the QB system is to sustain the design of learning experiences within the community of the University of Siena in order to provide answers to the questions that activate and feed the learning process, thus satisfying the stakeholders' needs and promoting the growth of the organisation.

The QB prototype shows the central role of the users through the - even visual - centrality of the "questions". These questions are considered to be the direct expressions of the needs people have during their everyday lives, during their daily activities within the university community, cognitively situated in their work environments.

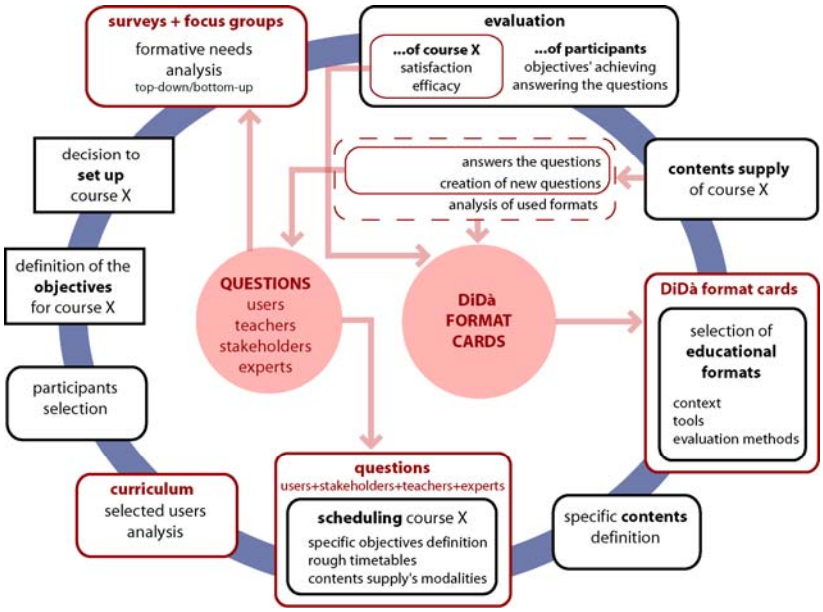

Fig. 3: *Prototype Question Based Learning (QB version 1.0), DiDà, 2002*

These questions exist to activate a process (Fig. 3) of *knowledge building* as conceived within a constructionist theoretical approach: the knowledge is constructed, not transmitted, by and within individuals and groups. This knowledge construction is a process stimulated by a problem, a question, a doubt, a dissonance [Bruner, 1997].

The context in which this process of knowledge building occurs is the community, which actively constructs and shares knowledge in a dialogical and continual refinement of circulating themes. This is consistent with Vygotskij (1986), which emphasizes that the construction of meaning and thought is distributed across tools, cultures, and communities. Vygotskij, in fact, affirms that cognition and intelligence are not properties of the single person, but derive from the interaction of an individual within his physical, social and cultural context [Vygotskij, 1978].

The institutional learning process within the QB system is conceived as the intervention of the administration to bridge the gap between the employees' knowledge needs (expressed by questions) and the knowledge actually shared within the community.

The process of designing these learning interventions begins with the collection of questions from all the stakeholders involved in this process of knowledge construction (potential participants, administrators, experts, teachers, trade union members, etc.) through the use of interviews, focus group sessions and questionnaires.

The cyclical shape, the iterative phases and the centrality of the questions collected make the QB prototype a "tool" for the design of learning interventions as the result of the different actors' needs, which emerge within their authentic work contexts and activities [Brown et al., 1989]

In fact, according to constructivism, context is an important part of the knowledge one constructs: knowledge will be as increasingly significant as its context is increasingly rich and authentic [Lave, Wenger, 1991].

Moreover it isn't possible to separate the knowledge from the experience that is the natural context for interpreting that particular information and constructing meaningful knowledge about it [Vygotskij, 1986].

Although the QB system is a cyclical, continual system, we can describe it by extracting these four key phases:

1. Activation of the course
2. Course planning
3. Content supply
4. Assessment and evaluation

Phase 1 consists in the process of activation of the course. An institutional training intervention (course) is activated:

a) When the questions asked by employees don't find an answer in the community (bottom-up procedure)
b) When the analysis of the workers formative needs (gathered with the questionnaire) express the necessity of constructing new knowledge within the community (bottom-up procedure)
c) When the management directly determines the organizational formative needs (top-down procedure).

During this phase the aim is to stimulate the expression of the stated needs in the form of questions in order to create material for the following step of the design process: planning the course.

Course planning is a real design phase in which the design team negotiates between two primary theoretical approaches to learning design: traditional instructional method and the constructionist approach. In fact, a set of real, concrete objectives is required (sometimes with a defined standard of performance) to be reached by every participant: e.g. practical skills that employees need to acquire in order to better do their work. These objectives are coupled with the overarching goal of stimulating learning and growth within the community, through the sharing of knowledge and the continued building of new knowledge, as is seen in the constructionist approach to learning. The importance of this goal is addressed by Bruner, who states that *meaning construction* is the process of learning by experiencing phenomenon (objects, events, activities, process), interpreting these experiences starting from what we know, reasoning on them and reflecting upon our learning activity [Bruner, 1990].

The main element of this mediation is that of the "question" which expresses formative needs. It serves to sustain and stimulate a dialogical knowledge construction: in fact the dialogic mode of interaction is pervasive in the life of such a community. "Dialogue necessarily plays a central mediating role since it is the principal means of arriving at a common understanding of whatever question is at issue." [Wells, 2000].During the course

planning phase, the main objectives of the course are defined with some referents (employees who will participate in the course, their managers, experts within the course topic, potential instructors), departing from real formative needs expressed as questions by the stakeholders during the previous phase.

At the same time the course must be tailored to the participants' working background and activities. For this reason the QB method requires the gathering of this type of information directly from participants and the direct use of it during the course planning phase with the instructor.

Moreover, in order to facilitate the course planning with the instructor, a set of ten format cards (DiDà format cards) were prepared with a selection of educational formats. The DiDà format cards are flexible tools that every teacher can edit in order to customize the course to meet the requirements of different specific learning contexts.

The format cards consist of five parts: description and application domain, didactical objectives, description and assessment, contextual information, and references.

Thus, as logically follows, the primary meta-objective of the course is to produce answers to the questions. These answers are constructed in a collaborative way during the course, using the formats that best represent the content (text, images, video, etc.), and captured to allow their reusability for knowledge[2] management. The characteristics of reusability and collectivity lead to the concept of the "Learning Object," which can be defined in the DiDà system as a paired unit of content (question/answer) produced collaboratively by the participants in the course. In DiDà, "Learning Objects" not only become modular elements to be integrated into future learning programs, as they are defined in other contexts [Wiley, 2002] but also demonstrations of the results of the training experience.

An additional outcome of the course is the set of new questions stimulated by the knowledge collaboratively built during the learning process. In fact, the learning activities the DiDà project seeks to realize must be developed and grown in a social and stimulating environment [Resnick, 1996]. Furthermore, the learning environment has to allow and sustain interaction among the participants in order to facilitate the construction and sharing of knowledge within the knowledge community [Evard, 1996].

The answers constructed during the learning process will be joined with other answers produced by the people who take part in the community, coming from inside as well as outside of the organization: workers, teachers, students, researchers, public institutions, professional trainers. The questions and their paired arrays of responses will then be termed *Knowledge Objects*, elements that allow the knowledge building and sharing within the community as a collective and participative process.

Thus, these two outcomes of the course, the new knowledge object stored and shared within the community and the new questions, become triggers for new knowledge sharing and new institutional learning interventions. Activities in the last phase of the process are geared toward assessment and evaluation but in an iterative prospective the outcomes of this process also constitute a propulsive element for a continuous learning process. The continuity of the

system must be designed in order to construct new knowledge upon the experience in a contextual manner with respect to what the learner already knows [Bruner, 1987]. In terms of the Vygotskij Zone of Proximal Development (ZPD), as the student learns and develops, the ZPD moves, indicating the mastery of some tasks (at the lower end of the zone) and the appearance of other tasks that can now be accomplished with significant help (at the upper end of the zone) [Vygotskij, 1987]. Thus, the assessment phase is considered to be the beginning of a new cycle of the learning process.

QB Testing and Refinement: the Design of a Bio-informatics Software Course

The first phase of testing of the QB method was carried out at the University of Siena from September to December 2003 before the issue of the 2004 educational plan for the administrative and technical personnel. To assess the QB method designed by the DiDà' team, a pilot course was defined for the technical personnel of several scientific departments. In this initial test, the QB method began to lay the groundwork for fostering a participative community of learners through the detection of instructional needs, the involvement of participants in the planning of a formative activity and by providing instruments for continued contact among community members.

Data Gathering

Analyzing the data acquired from the questionnaire used during the user and context analysis phase (WP2), the design team was able to extract a common instructional need that spanned multiple areas of the University. An outstanding instructional need was identified by the intensity of the response from fourteen different departments of the medical and biological area (i.e. molecular biology, evolutionary biology, environmental studies, human pathology and oncology). This group was selected for the initial experimentation of the QB method due to the unanimous expression in favour of a specific course in software applications for analysis in research laboratories. This allowed the design team to identify a well-defined context to test the effectiveness of the QB method in collecting the needs of a community and in activating a participative process for designing a training intervention.

The main concern of the design team was to establish a privileged communication channel with the employees in order to acquire visibility and act as an intermediary among the personnel, the administration and the instructors in collecting information on needs and in planning the formative intervention.

Pilot Course

In order to orient the planning of a pilot course to test the QB method a selected number of employees were contacted by mail. These employees represented potential participants in the course in software applications for research laboratory analysis. This action aimed to acquire a first set of questions to which the course should provide the answers.

The collected set of questions stimulated the process toward a following phase that allowed the design team to involve the representatives of the medical and biological departments, employees, and laboratory technicians in the planning of the formative activity. All of the stakeholders' contributions were needed in this phase for the following reasons:

- To identify a preliminary articulation of the course domain
- To extend the boundaries of the community addressed by the design team
- To validate the consistence of the first set of questions
- To collect new questions for which the course in software applications for analysis in biology laboratories should provide an answer
- To negotiate a common view about the course

To pursue a more active participation of all the actors belonging to the community, a focus group was organized. During the focus group the main objective of the design team was to consolidate its role within the community by continuing the experimentation of the QB method. The method was used to support the collaborative effort in planning the formative intervention. In the team's view some aspects were considered fundamental:

- Aims of the course
- Composition of the participants in terms of backgrounds and current occupations
- Formats to use in supplying the course
- Potential instructors within the representatives of the medical and biological departments
- Questions to which the course in bio-informatics software applications should provide answers
- Title of the course

By applying the QB method the questions previously collected were discussed and organized on post-it™ notes with respect to the new questions produced by the stakeholders at the beginning of the focus group. With respect to the questions, the group produced an overall map of the subject domain addressed by the course. This activity allowed a preliminary categorization of the course contents into different parts: a general section and two specific sections. Furthermore, the DiDà team discussed the selection of educational formats with the stakeholders (i.e. DiDà formats card), identifying potential format elements to be exploited in order to enhance the learning/teaching experience. A blended format of practical exercises/workshops and seminars was outlined as a relevant way to deliver the pilot course. The definition of the objectives of the course led the stakeholders to redefine their

previously stated course topic into a more representative one: bio-informatics software applications.

The participants' response to the focus group was considered successful. Moreover, four potential instructors were identified among the representatives of the biology department. As a result, the focus group produced a form defining a preliminary structure of the pilot course, accounting for the six aspects mentioned above. The form expressed not only a set of relevant interests shared by the stakeholders, but it also constituted the initial step for the next phases: the planning and delivery of the pilot course.

Starting from the suggestions emerged during the focus group about the composition of the pool of participants, we identified 22 participants for the pilot course and contacted them in order to collect their own preliminary questions and a description of their daily work activity.

During face-to-face conversations, participants were asked to explain verbally the specifics of the daily activity in her/his job and report them using a paper prototype profile form[3]. The profile form was structured in three parts:

- work history internal and external to the University
- daily activities, including software and tools used
- educational history prior to and during employment with the University

The form allowed the design team to better specify the status of each employee in terms of background and initialized the collection of data for the competencies database which would eventually support the knowledge community (K3).

Furthermore, the analysis of the profiles allowed the design team to get an insight into the actual practical requirements of each employee position. Through the compilation of narrative elements the employees were able to phrase their needs by situating them into their actual job activities.

The narratives revealed contextual aspects unavailable in previous references and atypical in forms of this kind. Thus, the use of narratives provided the design team with the opportunity to put the QB method into motion by eliciting questions directly from the participants for which the bio-informatics course should provide answers.

The following phase of the QB experimentation was oriented to the planning and delivery of the pilot course in bio-informatics software with the instructors identified during the focus group. The design team met with the instructors to present the course form (produced during the focus group), the list of all the questions collected, and the participants' profiles. We also proposed the DiDà format cards describing ten educational formats and their main application domain. This attempted to broaden the instructors' traditional view on teaching and learning, and to ensure an offering of the course according to the plan provided by the stakeholders during the focus group.

Using these elements, the instructors were able to organize a pilot course which consisted of three days of classes in a computer laboratory in the biology department. The results acquired during the pilot course experiment demonstrated the effectiveness of the QB method in that:

- the community was stimulated to negotiate a preliminary structure of the course
- relevant questions were produced which were answered during the pilot course

On the other hand the experimentation stressed the need to control the consistency of the course contents with respect to the objectives defined during the focus group and the questions collected. Considering the peculiarity of the topic the design team was not able to guarantee this consistency control and proposed to directly involve some of the more qualified stakeholders by assigning them the role of scientific advisor.

Final Course

After the refinements stimulated by the pilot course experimentation were implemented, the QB method was used within the University Formative Plan 2004 for supplying the bio-informatics software applications course that involved 63 participants and lasted 42 hours distributed over four weeks.

To plan the bio-informatics course a new set of questions was collected via mail from the participants and additional personal profiles were acquired through the project web site using an on-line profile form. A new focus group was organized involving the representatives of the medical and biological departments, staff, and laboratory technicians. The new questions collected and the ones produced during the focus group generated a more detailed preliminary structure of content that was used by the instructors to plan the course articulated into four different sections.

The design team provided the instructors with the new personal profiles collected and with the selection of educational formats (i.e. DiDà formats card). The design team asked the instructors to use educational formats that could facilitate a collective construction of knowledge and the generation of new questions. Presentation slides were laid out in question/answer format, reinforcing the structure of the content. Practical exercises and problem solving activity during the lesson provided an immediate question/answer environment (participant-instructor, participant-participant). As part of each course session, new questions were collected to allow the instructors to revise content and re-address elements not previously understood during a subsequent session.

It was observed that the questions were an effective medium not only for determining course content but also for determining the progress of participants during the course. The activity of formulating questions also augmented the level of participation from the group of participants, edging the course toward the ideal situation outlined in constructionist learning theory.

An additional objective of the design team was to assist in the solidification of a growing learning community, in an effort to support the continued activity of the course participants. To foster this activity, a mailing list requested from the participants was formed. By using it participants could reconnect with the instructor and their peers for the asking and answering

of questions regarding the software studied. The list was noted to be used actively by participants during the initial period of its existence.

Conclusions

The process of designing for learning and the production of the course for Bio-informatics software produced various positive results and several challenges for the future. The process of co-evolutionary design of the planning method that produced the central concept of questions and answers in QB, and the process of design of course content conducted with the participants themselves were each demonstrated to have a positive impact on the existing educational plan for university employees.

The concept of questions and answers was seen to be both a viable method for constructing course content and a useful tool for assessment and evaluation of the effectiveness of a course – the questions give concrete, participant-generated elements that can be tracked, discussed in groups, and organized by focus groups; and the answers, produced by instructors and participants, are not only the beginning of a community that co-creates content but also demonstrate the concrete results of a training course. It has been seen also, however, that at the beginning of the course planning process, participants find it difficult to formulate questions about an unfamiliar topic, even when the topic is directly connected to their work environment. Further work must be done to bridge that gap in the initial phase of the process, even though it can be seen that the cyclical nature of the method produces questions for subsequent phases of training, making the primary phase eventually less of an issue as topic categories begin to span the breadth of the university activity and overlap one another.

The process of co-evolutionary design as applied to the development and structuring of course content was very effective in bridging gaps in the learning community, promoting relationships among employees that otherwise would not have had the opportunity to work and study together. The bottom-up elements of the process – participation of the "students" in the design of a course – received positive feedback from individuals at all levels of the community and resulted in an increase in peer-to-peer training and question-answering after the course. This result was seen in the mailing list, which was very active in the period immediately following the course. Further work must be done, however, to provide additional, more effective instruments for the community members in their efforts to remain connected to a knowledge-building network, as the activity in the mailing list was seen to wane after a period of time.

An instrument to sustain multiple levels of activity; asking and answering of questions; reviewing, modifying, and development of knowledge objects; and daily stimuli that foster and maintain the community's co-evolutionary design of knowledge must be developed in the next phase of the project, earlier described as K3. Such an instrument or instruments must be conceived and constructed in such a way as to sustain the vitality of the interpersonal connections developed during course activities and focus groups. Only by humanizing the

process of knowledge building can we expect to see a self-propagating learning community develop.

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Endnotes

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[2] The DiDà project is now working on a system to capture the answers construct during the course in several media format (video, images, text, power point documents, html,…) and to study the refinement process of the questions during the course.

[3] The paper prototype was used to develop the interface of an on-line profile form used in the following phases of the QB course planning

A Passion for Learning: Unravelling the Potentials of Collective Learning

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Abstract

This paper investigates how to unravel further understanding of the dialogical processes that facilitate collective learning, through an approach that is attentive to its multi-voiced characteristics. It also empirically investigates how in practice, this multivocality can be concealed and how this limits this potential for learning collectively in management teams.

Essentially, this paper explores collective learning as a rhetorical storytelling process; one in which participants continually enact, explore and sustain diverse shared representations of reality (Boje, 1994; Jeffcutt, 1990). In doing so, the *passion for learning* is engaged with in two main ways; firstly, by investigating collective learning empirically – by drawing upon the author's own research – and secondly through a critical reappraisal of the extant theory underpinning collective learning methodologies.

Consequently, collective learning methodologies, in particular Team Learning (Issacs, 1993), is re-cast in terms of an ongoing storytelling process, a 'dance' of narratives in which shared representations of reality are re-presented through complex dialogical interactions between members. Through a theoretical lens incorporating social representations theory and rhetorical psychology it is possible to explore the rhetorical devices employed in this process, to gain further insights into how shared realities are negotiated and renegotiated.

It is possible to reassess the assumptions which underlie collective learning theorising. In particular, by highlighting a rhetorical understanding, it is possible to look at the emotional dimension, which is seen as neglected in organisational learning generally in contrast to the cognitive and behavioural aspects (Vince and Saleem, 2004). The Team Learning methodologies have acknowledged the emotional import of learning collectively through dialogue (Issacs, 1993). They suggest that, on the one hand, emotions can be raised through the surfacing and exploration of shared assumptions in the collective learning process. On the other hand, they suggest that learning is inhibited by emotions (Antonacopoulou and Gabriel, 2001). The theoretical framework employed in this paper engages with a 'third way' approach (Elkjaer, 2004) in which, firstly, emphasis is placed on utilising units of analysis which are neither exclusively individual (i.e. the reflective learner) or organisational (the community of practice), but alternatives such as events and situations, re-presented in stories constructed by participants. In this way, it is possible to engage with the "collective organization of reflection" (Elkjaer, 2004), how individual and organisation constitute the other continuously through a 'dance' of multifarious stories which re-present shared realities in the drawing up and upon social representations as commonplaces for understanding. Secondly, this perspective emphasises the importance of *emotions* as part of reflective thinking. This storytelling dance re-presents the identities and roles of the team, what constitutes learning within the team context and the performer.

Introduction

There has been much debate surrounding the potentials and practicalities of collective learning. Proponents suggest that learning organisations can emerge as long as effective dialogic techniques can be implemented in teams, whilst others suggest that this is impractical in the face of power inequalities in organisations. This utopian versus pessimistic perspective is documented elsewhere (Driver, 2000). This paper explores how it is possible to further understand the collective learning processes, engaging with the complex relationships inherent within organisational contexts.

This is achieved by tracing through how managers seek to re-present their own experiences in interviews, team meetings and documents. Firstly, it investigates how participants seek to persuade others (including the researcher) of the significance of particular arguments. This is achieved by drawing up and upon social representations, forming them as 'commonplaces' of argumentation. By anchoring them to existing social representations, it is possible to objectify others in order to unfold stories that re-present particular shared realities (Moscovici, 1984). This can be extended further by drawing upon rhetorical perspective (Billig, 1991), which investigates how through the argumentative nature of dialogue, meanings can be persuaded, negotiated and mediated. It can be seen that particular constructions are drawn up and upon: establishing identity of the team, of learning, of what is a team member.

Secondly, in tracing this process, that it is possible to understand how learning has an emotional import. In emphasising the rational element in dialogue, the current literature is in danger of ignoring the significance of the affective in learning. Narratives constructed by appealing to commonplace representations, for example, involve the emotional as well as the rational. This means that emotion impacts upon the experience of participants in the learning process. As extant literature points, out, engaging in processes of reflection involves an experience which is emotional as well as cognitive (Senge, 1992; Senge et al, 1995). What this paper reveals is how this results from, for example, a loss of identity as participant in the storying (Gabriel, 2000; Sims, 2003).

Fourthly, it can be seen that there are multiple stories being told which, at times, compete from the high stories of progress and improvement, through to the low stories of failure and challenge. This addresses the common criticisms that too often the latter are ignored by more utopian literature (Owenby, 2002).

Articulating Learning in Three Ways

Team learning has emerged as a 'discipline' or body of work associated with the rise of the Learning Organisation concept (Issacs, 1993). The critical dimensions of team learning (Senge, 1992) – of critical inquiry into deeply-held assumptions; the coordinated action emerging from 'operational trust'; and the impact of effective learning teams upon other teams – have been drawn from the broad field of collective learning and propose it as an approach to overcome the problems in organisational learning generally. It has been

suggested that teams are vital for developing organisational learning (Senge, 1992). Its proponents talk of huge potentials for improved team and organisational performance through the synergy created by the alignment of mental models, without which 'negative synergy' can occur through group pathologies, such as groupthink (Janis, 1982).

Elkjaer (2004) suggests this discipline, with its focus upon the achievement of particular skills – is an exemplar of the 'learning as acquisition' metaphor. However, he notes that this approach has limitations: being individualistic and making somewhat naïve assumptions about the constructed nature of reality. This is summed up by the paradoxical view that Team Learning investigates the social construction of shared realities, yet also claims to reveal objectively real systems (Brown, 1996), in direct contradiction to the emergent systemic thinking of Dewey, which is the experiential root of the discipline (Elkjaer, 2004).

Alternatively, the idea of the collective investigation and sharing of shared representations of reality in groups has evolved through to the more recent notions such as communities of practice (Brown and Duguid, 1991). This work around situated learning in communities has begun to move the focus away from focus upon outcomes such as 'alignment' or 'groupthink' towards engaging with ongoing dynamics of *participation* within a collective such as a management team and especially the implications of participants who are marginalised on the periphery of this process.

However, both the acquisition and participation metaphors have their limitations. The 'participation' way tends to ignore *what* is being learned and *how* learning is taking place, whilst the conventional metaphor of 'learning as acquisition' focuses upon the individual mind as a container, which overlooks the socio-cultural experience of learning in the workplace in favour of cognitive acquisition in the classroom (Gherardi and Nicolini, 2002). .

A "third way" for organisational learning – through social worlds – has been proposed elsewhere (Elkjaer, 2004). This looks beyond individuals acquiring skills or knowing how to participate within communities, but also the significance of *emotion* for individual and joint inquiry as individuals and collectives constitute themselves within social worlds. This paper engages with this idea, as it focuses upon the various stories which are spun out through the rhetorical interplay of managers within a service organisation.

Storytelling in Team Learning: The Triumph of the Univocal over Multivocality?

Extant literature relating to Team Learning draws upon a systems root metaphor (Rowe, 2004). This perspective assumes univocality: that there is a single Truth, an objectively identifiable outcome – whether successful 'alignment' or Groupthink – which can be identified and addressed through specific dialogic techniques. Ultimately, this diagnosis and prescription means that for the Team Learning theorists effective dialogue can reveal the Truth, a strong-form dialogic rationalism (Myerson, 1994).

However, the narratives which emerge from this work have proven to be partial stories. For example, certain team learning exercises, which had been originally championed as successful

were short-lived exercises as Unions and management closed down these experiments (Dumaine, 1994), whilst the renowned examples of 'groupthink' have been reassessed as post-hoc rationalisations of key individuals (Stringer, 1990).

What this paper suggests is that in order to explore the multiple and conflicting narratives, it is important to reinvestigate the processes through which team learning is meant to take place. For instance, later research into the dialogic processes at the heart of Team Learning question the potentially simplistic nature of the models. For example, defensiveness has been automatically assumed to mitigate against learning (Argyris and Schön, 1996), however, it can act as "a stimulus to inquiry rather than as something to overcome or avoid" (Friedman and Antal, 2005: 81).

The key lesson is that it is important to investigate the complex processes through which shared representations of reality are enacted, rather than assuming a simple cause and effect model between particular dialogic interactions. Rather than merely identifying 'defensive routines' or instances of inquiry or advocacy, more exploration is required into how these processes are influencing the aligning of shared realities.

In summary, it is a question of investigating how dialogic interactions shape these 'truths' and the impact these processes have upon the participants, the team and its environment, as social realities are re-formed and re-negotiated that is important. Rather than assuming to represent ultimate truth, the focus shifts towards investigating how truths are re-presented; ensuring that the multiple (and potentially contrasting) 'voices' are acknowledged.

Emotions and Team Learning

The extant literature highlights the critical dimension in team learning of an 'operational trust' between team members (Senge, 1992). But, there are confusions over the role of emotions: seemingly the passion of advocacy in discussion and debate is disparaged, as it generates more emotional 'heat' than rational insight (Issacs, 1993). This communicative rationality acknowledges that emotions are invoked when deep-seated assumptions are explored, and that this stimulation of the affective dimension inhibits the cognitive. However, does this infer that emotions are to removed or at least marginalised for *truly effective* learning to take place?

Recently, more intricate arguments have been made to articulate how the subtle interplay of *both* inquiry and advocacy of arguments is important in order for teams to achieve shared understandings in the hurly-burly of organisational life. For example, the illustrative metaphor of an artist's palette is introduced to show how team members can use different dialogical techniques in order to attain 'alignment', through the judicious use of both inquiry and advocacy (See Senge et al, 1995). However, increasingly organisational learning research has highlighted the intertwining of emotions and cognition (Vince and Saleem, 2004).

Developing an Alternative Perspective:

Taking account of the above criticisms in the extant theorising, the next section explores how by combining Social Representations Theory and Rhetorical Psychology it is possible to engage more fully with learning in teams.

Representing the social: Drawing Up and Upon Commonplaces

David Bohm suggests that "we see the world according to the general collective representations circulating around our society and culture" (Bohm, 1996: 59). This is at the heart of Team Learning research, influencing many who adhere to a metaphor of learning as acquisition (Issacs, 1993; Senge et al, 1999), but also the socio-cultural perspective emphasis upon shared representations of reality between participants (Gherardi and Nicolini, 2002). The problematical issue is how to comprehend the shared sensemaking, to look beyond individual mental models, to follow the recent view that learning is neither purely individual nor organisational; as 'social worlds', in which individuals (teams) and organizations are mutually constituted by – and constituted through – their commitment to organisational life and work (Elkjaer, 2004).

In this regard, the originator of the social representations idea notes that they "are the outcome of an unceasing babble and a permanent dialogue between individuals" (Moscovici, 1984b). Moscovici suggests that the aim of social representations theory "is to discover how individuals and groups can construct a stable, predictable world out of such diversity" (Moscovici, 1984: 44). Collectives, he claims, need to perform this re-constituting of 'common-sense' in order to operate, these representations that embody ideas in society become, and behave like, material realities shaping society.

The notion of 'social' representations attempts to emphasise the sharedness of representations. To use an ethnomethodological analogy, social representations are not simply collectives of individual cognitive maps that happen to be similar, but are as much products of their processes of sharing. This is important because Moscovici has argued against the notion of a 'group mind', because it suggests the fallacy of a group mind/individual mind dichotomy. Hence, his work has been described in terms of a socio-cognitive perspective, which attempts to describe the 'social' a collective term that avoids centring representation in either an 'individual' or 'group' as a fixed, immutable entity. Instead, they form effectively the theories-in-use of organisational culture (Kummerow and Innes, 1994).

Moscovici uses his conception of *Anchoring* as a key mechanism through which unfamiliar phenomena are incorporated into pre-existing frameworks, links in with extant Team Learning; it reveals how collective decisions are made based upon ideas that have become embedded within the collective conscience and influence acting and thinking. This is linked with *objectification* in terms of political or intellectual groupings whose authority stems from "the art of turning a representation into the reality of a representation, the word for a thing into a thing for the word" (Moscovici, 1984: 38). Again, this suggests that representation is a

dynamic act of 'world making' rather than 'world revealing' (re-presenting reality, rather than representing ultimate Truth), the stories that become prevalent being more successful, at the expense of disenfranchising other members' views.

However, it has been pointed out that SRT places over emphasis upon the homogeneity and static nature of social representations. There is a danger of assuming that social representations are completely objectified, that they are homogenously adhered to across all participants; ignoring the processes through which new representations are formed. As Billig points out, in practice, the anchoring of new ideas to existing representations is only one half of rhetorical dialogue (Billig, 1991): it is often the case that phenomena is divided off from current representation, what he terms *particularization*, which forms a counter-process to the categorization formed through anchoring.

In this way, a more dynamic view, that takes account of potentially contrary aspects of social representations. In this, rather than simply looking at how participants categorise, or anchor, information to representations, the processes through which such categorization is negated "we can particularize information and treat it as a special case" (Billig, 1991: 73). This adds to the current understandings of collective learning. It begins to reveal how sensemaking is divergent and multifarious. Rather than assuming a single outcome (whether successful alignment or unsuccessful Groupthink), it is possible to trace through of diverse voices which are seeking to re-present reality.

It is possible to understand the functioning of social representations as rhetorical topics or 'commonplaces', argumentative themes or topics, that the competent orators able to draw up and upon in order to support their reasoning. This envisages how particular networks of images and concepts are formed in society forming the arguing society (Billig, 1991). This is analogous to Shotter's discussion of Vico's rhetorical notion of a culture's *sensus communis* or 'common sense', whereby the latter is constituted by "socially shared *identities of feeling*" (Shotter, 1993: 54), or "sensory topics" (Ibid.). These give rise to commonplaces which form the "shared moments in a flow of social activity which afford common reference" (Shotter, 1993: 54), or what Weick describes as the "cues for co-ordination such as a generalized other, prototypes, stereotypes, and role" (Weick, 1996: 42). This is echoed in social representations theory.

This moves on from the existing team literature. This focuses upon the identification of static representations of 'shared mental models' or 'team mental models'; in order to facilitate effective team processes (See Castellan, 1993). Indeed, drawing upon Moscovici and Billig develops a perspective close to the philosophical underpinning of the 'team learning' process because this reveals a dynamic view of what Bohm talks of as 'communication' in terms of "making something in common" (Bohm, 1996: 2). It is the ongoing constructing and reconstructing of 'common sense' through storying which is the key dynamic of learning collectively in teams: which draws upon not only the cognitive but affective dimension as well.

The Centrality of Passion within learning

By conceptualising these commonplaces as communities of feeling, it is possible to introduce the affective dimension into Team Learning in a more significant role. Some attention is given to the affective dimension of learning. However, often this is translated merely as a pathological – as an inhibitor of learning, which can be overcome through the use of certain dialogical techniques. It is stated that ignoring the affective dimension of learning is to limit ones understanding of a complex process – something which organisational learning research generally has tended to do, with its preoccupation with cognition and behaviour (Antonacopolou and Gabriel, 2001).

Indeed, further work has begun to reveal the intrinsic nature of the emotional dimension of collective learning. Emotions arise when individual or group concerns are affected: when external changes in the environment impact upon a team, or with particular interactions between members (De Dreu et al, 2002; Edmondson, 1999). These factors can influence aspects such as team safety – the climate of trust within which participants feel able to engage in learning, which can involve the taking of risks in the knowledge that (well-intentioned) action will not result in rejection or punishment. Indeed, collective feelings, whether negative or positive, are seen as extend beyond the sum of the individuals contained within the group; resulting in feelings that shape the appraisal of an event or the behaviour of group member "resulting in a firm consensus about the injustice, or threat, or whatever the event was that elicited the emotions" (De Dreu, et al, 2001: 209). Vince and Saleem (2004) suggest that organizations are inherently emotional places, that investigation of emotions in organizations is vital in providing opportunities to question and understand "the meaning of emotions in context: what emotions say about attempts at organizing; which voices, approaches, structures and designs are likely to be supported and for what reasons; how emotions consciously and unconsciously construct organization; and the consequent limitations on individual and collective behaviour and knowledge" (Vince and Saleem, 2004: 133). Clearly, to begin to understand the role of emotions in learning is to begin to engage more fully in the multiplicity of voices.

The link between learning and emotion mirrors the Team Learning methodologies, with their emphases upon inquiring into underlying assumptions: which can result in significant emotional impact upon the participants (Issacs, 1993). In turn, learning is shaped through the emotional proficiency of the individual to allow or deny an emotion in a given context, suggesting a complex interrelationship between learning and emotion "Learning may tame and contain emotion, but it is itself shaped by emotion, or even the product of emotion" (Antonacopoulou and Gabriel, 2001: 443). Emotions are central to understanding the rhetorical dynamic of team learning: the identification of shared realities, the appeal to commonplaces, even the defining of what constitutes knowledge or learning within a particular context.

Investigating Multivocality into Team Learning: Joining the Dance

To understand Team Learning is to appreciate the multifarious ways in which participants negotiate and renegotiate their shared realities. The managerialist and utopianist accusations levied at team learning methodologies (and organisational learning generally) are claiming that the many voices are drowned out in favour of one.

One approach to engage with this multifarious nature of organisational realities is the storytelling approach. This allows the investigation of the passion of Team Learning because tracing these stories "takes us directly to those events and experiences that generate strong emotions" (Gabriel, 2000: 240). Gabriel (2000) introduces a typology of stories; each one depicts characters and plots and generates particular emotions in narrators. It provides a workable typology for understanding the stories that have been highlighted in the extant literature. For instances, the Epic stories with their heroic protagonists, scoring noble achievements over challenging situations seem to populate the populist literature (Senge, 1990). But, on the other hand, so do some comic stories, whereby the protagonist is seemingly a deserving fool, chastised by their own mistakes, such as the Groupthink scenarios (Janis 1982), or tragic stories, whereby failure arises from unforeseen misfortune (Gabriel, 2000). However, Gabriel acknowledges that in practice, there are many complete and half-finished stories that intertwine with each other as the protagonists seek to re-present their shared realities.

One way of conceptualising the mélange of stories is to understand them in terms of the metaphor of dance (Rowe, 2004). Three definitions of dance, taken from Chambers Shorter English Dictionary (Chambers, 1949) are 'social function', 'measured steps' and 'to perform'. The first definition highlights the ongoing dynamic constructing of the social context, the development of a sense of community, i.e. the sense of being a 'team'. The second addresses the criticisms made of the univocality of extant research by investigating who is defining the correct steps to take within the performance: for instance, what particular re-presentations are there of 'learning' within the dance. The third accentuates the performative nature of learning; concentrating in particular upon how participants become members of the community.

The empirical presentation below develops an approach which is sensitive to the stories and proto-stories emerging from ethnographic research carried out by the author in a 12 month study of a management team at a Students Union in an English University (Rowe, 2001). By tracing through these narratives with plots and characters and which generate emotions in narrator and audience (Gabriel, 2000).

Overview: Unravelling the Stories

This section will refer to empirical examples which will investigate the rhetorical processes. This analysis does <u>not</u> attempt to represent *the* truth, but to engage with how realities were being re-presented in stories told by managers. Therefore, the focus is upon the rhetorical manner in which these stories are constructed; the ways in which stories are spun in

order to persuade others of the validity of particular arguments, but also of the credibility of the storyteller (Watson, 1994). In doing so, it is possible to engage with how communication takes place, but also how human beings think as well as behave and emote.

At a practical level, Billig's theorising informs how to perform empirical analysis. Suggesting that the researcher should try to comprehend the discourse in an argumentative sense, not only the words or images in a speaker's mind but also "the positions which are being critized, or against which a justification is being mounted (Billig, 1996: 91).

This involves the constructing of argumentative positions (*logi*) and the development of counter-positions (*anti-logi*). This involves the drawing up and upon of particular commonplaces as participants attempt to persuade and negotiate their constructions of reality.

An Opening Vignette:

Vignette taken from the final meeting the author attended, where the Finance Manager [JD] was both justifying his failure to complete the annual sales and profit statistics, which led to an interjection from the General Manager [PH], who was chairing the meeting:

> *JD: This year's figures I have yet to figure out*
> *JD: But can I say that all areas must work to reduce their cost levels*
> *JD: We need to keep costs down so managers should look at internal resources before any application for funding*
> *JD: I expect that unless it's Health and Safety you should use your own money*
> *JD: It's been a very expensive year with EPOS being introduced so can people be careful with expenditure?*
> *PH: Any comments [no answer]*
> *PH: I think that this is becoming a key issue.*
> *PH: One of the reasons is that managers take on more student staff which is OK and the exec is keen on this.*
> *PH: That is OK, but you have to make sure that it's necessary and our subvention hasn't increased for three years so that is a loss effectively*
> *PH: For example, can I say I've heard people say "budgets that is JD's job", when asked by the auditors.*
> *PH: But it's now about manager's ownership and responsibility, people should ask if they can cut costs because people won't always buy beer in the future.*
> *PH: For example, in [Australian Students Union] bars have banned beer after a student died from alcohol poisoning which would hit our profits.*
> *PH: What is impossible and ridiculous can happen don't think "it couldn't happen here"*
>
> [Management Team Meeting 8]

This is a prime example of what team learning theorists would describe as 'cool inquiry' into existing assumptions (Issacs, 1993). Higher level learning involves the 'rational' investigation into shared mental models that can inhibit thinking. PH is challenging how the management team members think, act and communicate within their own departments as well as with those external to the organisation: questioning their shared representations (Argyris

and Schön, 1996), but choosing his words carefully to not directly blame particular individuals – which is seen by Team Learning theorists as counter-productive, invoking defensive behaviour (Senge et al, 1995).

Consequently, it is a sophisticated rhetorical re-representation of reality which is shown above, one in which the emotions are engaged as well as the cognitive dimension. PH is appealing at a rational level, but also emotionally appealing to the listeners in order to gain their understanding, to connect with them. This reflects the argumentation in social thinking: both JD and PH acknowledge the *counter logi* the other side of their positions. The use of student staff is re-presented as both a positive policy for departmental managers to take, but it is (on the other hand) also acknowledged that it causes problems for the running of the organisation itself. Similarly, JD is asking for team members to minimise their expenditure – categorization – whilst also acknowledging the need to spend money upon certain areas, such as Health and Safety – particularization. In doing so, they are re-presenting particular constructions of reality, stories that define the role of management team members, the situation that the organisation finds itself in a 'Changing environment', one which is challenging the 'existing culture', effectively encouraging higher level learning. This storytelling is akin to the heroic and epic narratives that are often seen as characteristic of senior management trying to engender change (Gabriel, 2000).

The following analysis shows that these social representations are not emerging out of 'thin air', but are embedded within a socio-historical context. Through the ethnography, it was possible to engage with the argumentation involved as participants sought to make collective sense of their context. Also, it can be seen that the particular epic and heroic stories above are not the only ones at play within team discourse. In addition, these stories are not merely delimited to the boundaries of the canonical – the management team and its meetings – but also spreading beyond these throughout the organisation. The next sections will trace through these stories through the ethnography.

A Team or Not a Team? Contrasting Stories

Rhetorical appeals were made which re-present the team drawing up and upon certain social representations. In this way, support was enrolled for the *objectification* of a social representation of the managers as 'the team'. However, this was by no means a stable consensus.

In order to describe the 'management team', the senior managers in particular, re-presented stories of a complex of meetings, staff meetings, etc. To this end, there were various images drawn upon in order to exemplify the stories. For example, both in meetings as well as in the author's interactions with managers, the term 'Cascade' was applied. In a later management meeting, the Training and Personnel Manager [MP] invoked the term 'cascade' in order to explain how the 'management team' related to the organisation. This social representation of 'cascade' has been objectified by its use throughout Human Resource Management policies in

many companies as well as through the HRM literature (Harrison, 2003). It was used to describe the interrelationships between managers and staff in the Union. It formed a commonplace as a social representation that participants could draw upon in engendering particular stories. Also developed were the terms 'communication forum' as well as 'team briefing', which performed a similar role.

The term 'team briefing' was coined by the General Manager [PH] during the research program. PH introduced this as a title for the handouts that were handed out at the meetings, which replaced the blander 'Management Meeting'. The key point seemed to be that the term 'team' was being introduced again (for example, it was already on the minutes) and the 'team briefing' was being 'anchored' (Moscovici, 1984) onto this social representation through this *epic story* that emphasises the overcoming of problems (Jeffcutt, 1994).

However, there were other stories emerging, drawing differing re-presentations of team, whilst also drawing up and upon similar representational elements. Direct refutations, using representational elements to query whether the management team conformed to a social representation of 'team'. Therefore, it is possible to see the use of categorization and particularisation in this respect; for instance, when both the Advice Centre Manager and Commercial Adviser showed unease with even applying the term 'team' to the managers, JW suggesting that the four senior managers constituted a better example of a team:

> *JW: Well, just because they are slightly more management orientated, and, and, have, I don't know, more chance to work in a smaller team. I don't know, more chance to work in a smaller team, I don't really know, I just think that it works better in a smaller team, and it just filters down to us in some way. I hope that that answers your question.*
>
> [Interview Advice Centre Manager: 119-132]

Here, the representational elements of 'an information sharing forum' of a 'cascade' are drawn upon in order to tell why the management team is not a team (or less of a team). The refrain that the 'management team' is not a complete team is heard. This is a divisive story being told that divides 'periphery' from the 'core' of the management team[2]

> *BW: I find it difficult to relate to it as a team, going here, there and everywhere, trying to this, that, to be honest. Yes, it is a team in that almost everybody is trying to strive for something can be called a team.*
>
> [Interview Commercial Adviser: 107]

However, it is interesting to investigate this critical reflection more closely. BW's concern is to put across what he 'really' thinks constitutes a team. His comments reflect an argumentative presentation, or rather the two-sidedness of argumentation (Billig, 1991). His conversation is complex, akin to a rhetorical 'dialogue' as BW puts forward *logi* and counter-*logi* – 'this is not a team' but 'this is a team-in-the-making', as well as a team can be categorised as 'meeting regularly' whilst non-teams only meet occasionally.

This involves drawing upon social representation of a 'team' as a 'collective of people working closely together', which is proposed in the team-based literature (Katzenbach and Smith, 1993). BW draws upon this social representation to support his argument in a

somewhat different way. He is interested in describing the physical presence of 'team', whereas Senge et al are interested in the cohesive co-ordinated 'teamness' that develops in learning teams (Senge, 1992).

However, it was noticeable that the refutations were limited. Although elements were identified as not working as well as the proponents suggested, they were often accepted. For example, that there was an entity that was being termed a 'management team', and that this was a change from the past.

Also significant in re-presenting the 'management team' was how it was identified as a 'Non-political' team. In this, it is possible to explore how the managers grappled with the relationship of the team with other actors. In one sense, it formed what extant literature would term an 'undiscussable' issue (Issacs, 1993), it was drawn upon to attenuate dialogue, but also a source of shared sensemaking: emotions of frustration, as well as laughter. For example, there were allegations of misconduct levied at a member of the executive [VP], which spilled over into the pasting of defamatory posters around the Union's walls.

> *RA: I've noticed that there are a lot of VP posters do we take them down?*
> *PH: No you shouldn't touch them because that gets us involved with the politics and accusations from either side*
> *RA: It just seems unfair because he's still a member of the Union and it looks as if we're taking supporting the accusations*
>
> [Management Team Meeting 6: 116-118]

PH's very carefully described argument defines the role of the 'management team' re-presents the 'management team' as a 'non-political', through defining 'political'. This 'political/non-political' story is a narrative that was constructed elsewhere, for example when RA held a meeting between members of the Finance Office, when the issue of Investors in People was brought up, RA stated "The Exec are keen on this so that's that [silence]", thereby attenuating the dialogue, getting the last word (Billig, 1996); suggesting that a commonplace social representation that is drawn up and upon in order to define the boundary between 'non-political' and 'political' Union. Indeed, where the issues were introduced into the departmental meetings, but even here the issues related to students are not freely discussed; even to the extent that at this meeting of the Finance Office, the author was asked to stop writing.

Another complex issue that the team grappled with was the employment of Student staff – which (as the opening vignette revealed) was supported by the Executive and the Senior Management. However, there were contrasting narratives given by other managers.

As the Property Services Manager lamented in an interview "I mean it's very hard to get them to turn up they want the job but they don't want to learn how to do the job properly they just want to do the job" which alongside the loss of students away revising for exams meant that the appraisal "has gone to pot". Similar comments were made during the study. However, mainly these were made outside of the management team meetings. For example, the author

attended some of the Retail Managers sub-committee meetings, usually held a couple of hours after the main meeting.

> *CW: Also a student has asked to do a Business Studies NVQ do we give her time to do that?*
>
> *BW: No we are not here to improve their careers*
>
> *CW: What good is it to appraise the students we are told it will help them when they leave*
>
> *CW: But are we a business?*
>
> *JH: Originally I was told it was handy to employ students as they were here*
>
> [Retail Manger's Meeting 2: 222-226]

This vignette re-presents a number of narratives as the retail managers portray themselves as struggling to contend with disinterested student staff, an exec keen to hire student staff and the need to break even. Unlike the senior managers, GC and the other retail managers are telling 'low stories' (Watson, 1994), cynical of the changes that had been recently introduced. This suggests an apparent difference between an optimistic espoused story, that PH puts forward, and a more pessimistic story re-presenting 'the reality' of organisational experience.

This discontent culminated in a survey carried out by the retail managers in order to 'prove' that the problems of student staff at certain times of the year were damaging the Union. However, even this criticism was couched in well-chosen discourse, with the rider that "Whilst this meeting may seem to be a criticism of the students employed by the organisation we wish to assure staff that it is not. Most of the students employed in the trading outlets elicits nothing but praise from their managers", a product of a revision. The author had asked for a copy of the final paper of this survey for the author's data. However, reading this version, along with the little conversion the author had with a retail manager CW when picked it up, was significant, because as CW noted the comments had been redrafted "because there were things in there that couldn't be put in so the language had to be toned down" after the previous version. The added section attempted highlight that the criticisms of student staff were re-presented in a particular way. Any criticism indicated was phrased so as to ensure that there is praise for student staff.

This was an example of how the team presented itself to others. In particular, it revealed how the emotions arising from experiences had to be kept under control (through the use of particular media). Although as the observations show, this emotional control was re-presented as how the team negotiated its identity with other groups. It is NOT simply the case that emotions were repressed by senior management: the key point is that the representation of student staff formed a potent representational element around which shared understandings emerged. Indeed, the drawing upon this element allowed senior managers to gain support, to make connections with other managers.

For example, although there were instances where criticism of students was muted, there were still occasions when even senior managers were openly critical of students. For example, in the final meeting that the author attended the General Manager also drew upon this social

representation to connect with the other managers, acknowledging that "I know there is a number of comments made about other areas which is not on. Also I know that student workers are not interested in anything outside of their job". Clearly, then, the representational element 'student staff' forms a rhetorical commonplace that can be drawn upon by managers. PH perhaps understands this as a implementing a differing rhetorical strategy, in a sense following the rhetorical deliberations of the ancient Greeks. For, as Quintilian suggested it may be necessary for the rhetorician to change places in particular circumstances (Billig, 1996).

This shows the importance of emphasising the processes rather than outcomes. Because, it could easily be assumed that the senior mangers like PH tell only positive stories of students, as opposed to the line managers, whom directly work with them. Instead, both groups tell differing stories on different occasions to buttress particular arguments and entice further support.

Re-Presenting 'Learning'

Drawing upon existing social representation of 'learning from experience', making mistakes and trying to avoid them in the future, was a common representational element. As in an interview, the Commercial Adviser commented that "It's literally being changed as we go along, learning from our mistakes and doing away with those and introducing new ones". Consequently, 'learning' here is re-presented as an informal process, drawing upon an experiential 'trial and error' representation, whereby "learning occurs when errors are detected and corrected" (Argyris in Moingeon and Edmondson, 1996: 5).

In a subsequent meeting, the Administration Manager [CWD] reported upon a project with local schoolchildren, who had completed an exhaustive customer survey of the university population's needs and requirements from their local Union:

> *PH: I think it's also quite good to see it being slightly critical we all need to learn from mistakes made in the past, which is only natural*
>
> *PH: for example, I have something here titled Why Do We Lose Customers? Triggered by some research from elsewhere*
>
> [Management Team Meeting 4: 72-75]

Again, by drawing upon a representational element that describes learning as 'a beneficial outcome', PH can engage a social representation to PH can anchor his own research in order to support his argument. Note the emphasis upon 'learning' as being codified knowledge, which was a recurring theme in the study. For example, the General Manager impressed upon the 'management team' the importance of ensuring that staff members say 'the right thing' when the Investors in People assessors came around:

> *PH: It's too easy for people to forget or take for granted that their work required training*
>
> *PH: This formal and informal training is what Investors is looking at*

PH: You need to point out this learning to staff and Investor assessors

[Management Team Meeting 2: 46-48]

Here, 'learning' is equated with 'training' and articulation of tacit into codified explicit knowledge, this story is performed in order for the managers to adopt this definition and ensure staff members adopt it as well. Observe the connecting of good business practice with the ongoing process of Investors in People accreditation. This suggests that PH is re-presenting Investors in People as an element in a developing social representation of a 'learning culture'. He is drawing here upon a common epic narrative emerged from the storying of the senior management in particular. The narrating of attempts to overcome existing obstacles: drawing upon social representations of the 'existing culture' and it was being 'improved' drawing up of a new social representation – a 'Learning Culture' – which was partly objectified through the anchoring upon other representations. For example, when the Personnel Manager [MP] spoke in a meeting part way through the ethnography that "it's a culture change that people feel they can ask us without feeling intimidated". In the following meeting, the General Manager picked up on this and suggested that there was a need for Investors in People accreditation in the Union:

PH: I know this is not easy and is a change of culture, it won't take place overnight but this what we need to do to move this students' union forward

[Management Team Meeting 5: 64]

This is an example of drawing up a socially held representation in order to support particular argument. By contrasting a depressing existing reality against the potentially favourable new future, a more romantic story is being told. Therefore, the new culture is re-presented as 'learning' from the existing 'problem'.

Therefore, the 'Existing culture' was highlighted and drawn upon as an element in order to support the learning culture representation. The poor communication between departments, for example, was acknowledged. Other representations were drawn upon as elements 'Continuous Improvement' 'Changing environment', 'Investors in People', as the senior managers in particular, sought to *objectify* the social representation further in both meetings as well as company literature. Indeed, in doing so, this objectification of the new culture effectively anchors it to more established social representations such as 'continuous improvement' and 'Investors in People'. A clear example of this being demonstrated in the Handbook given out to the members of the 'management team', in which Investors was described as helping "develop a culture which is based upon continuous improvement, where the individual will no longer be fearful of change but will welcome new opportunities and developments, where uncertainty will be a challenge and opportunity, not a threat" in the rapidly changing society**.**

Here, by invoking particular representations, the Handbook is using these as elements in order to develop a commonplace to base the argument for a 'learning culture' (Billig, 1991). The key point is that these narratives are developed in order to support particular

argumentation. By categorising the existing situation with certain characteristics, a shared understanding can be developed between teller and listener. Whether the listener is a researcher or other members of the 'management team', or both, as is the case in a meeting.

Contrasting stories of learning culture?

It is important not to assume this smooth story of a successful introduction of a learning culture. In fact, the elements are drawn upon in order to provide counter *logi* arguments that propose contrasting stories: potentially unravelling the smooth progression of the change of culture.

There were comments made in response to the introduction of the Investors initiatives, whereby the departments were encouraged to begin their own staff meetings, to share information about the Investors in People accreditation process:

> *CW: so as one shift ended people were still there as others turned up but it's difficult people getting called away to the tills*
>
> *MP: Again is it possible to swap staff from the other shop as PH said?*
>
> *CW: Yes but difficult to do this because of the different systems*
>
> *MP: Therefore surely training is needed?*
>
> *CW: Staff refuse point blank to swap*
>
> *MP: These refusals are ridiculous as it says so in the job description*
>
> *BW: You can't force people to work*
>
> *JW: How can you make them work if they don't want to?*
>
> *GC: You can get volunteers*
>
> *MP: YES but still need cross training between the shops*
>
> *GC: Yes but they can't do this or won't*
>
> *BW: We have tried to get Union into Campus Shop to EPOS once before and they refused*
>
> *CW: Needs enthusiasm by staff to do so*
>
> *GC: The cleaners enjoyed working in the shops*
>
> *PH: Flexibility amongst staff is very important but that is something for the future to get through to staff*
>
> [Management Team Meeting 3: 85-105]

In this vignette, a number of points can be discerned. The issue shows heated interaction, with conflicting representations of the shop workers with MP attempting to question the logic of the 'pessimistic' view of the Retail Managers. The critical questioning into the assumptions of the other moving beyond 'cool inquiry' into debate; represented by the increasingly heated exchanges querying the re-presenting of flexible staff, who can (or want to) be trained –

connecting with the low stories told about the problematical student staff. But it shows the shared understanding of the 'existing culture': the awkward issues surrounding the use of staff. MP and PH extol the need for a change of culture a 'learning culture'.

Re-presenting 'Team Member'

One of the critical dimensions identified for learning in teams is the need for co-ordinated action. This emerges from shared understandings that develop between team members, like a jazz trio 'in the groove' (Senge, 1992). This need for cohesive interaction has been noted elsewhere in management theory, particularly in team theory (Castellan, 1993; Katzenbach and Smith, 1993). What the author noted in the study was how team members referred to themselves as well as other members. They were developing stories, which re-presented self/other relationships (Boje, 1994; Gabriel, 2000), an ongoing process through (for example) which shared understandings could develop.

The affective dimension of team learning is significant here. Firstly, there were positive emotions arising from the re-presentation of self, the team and its members: re-presenting the cohesiveness and ability of the team to cope in its dealings with its environment. Secondly, there were instances of negative emotions arising from predominantly the suspicion of particular sub-groups within the team.

In the presentation of self as team member, a key facet of re-presenting 'self' was narrating 'how I am meant to act'. In the in interviews, there were references made to these expectations, and these were supported by the observations. Members suggested that their experience was required in the team, and that they benefit the team by bringing in 'common-sense'. More importantly, though, was how their identities were being constructed in meetings. There was also reference to specific ways in which members are meant to participate. In particular, there was a distinction made between being a manager of the department and member of the team, the social representation of managers having 'different hats' and balancing the need to represent their respective departmental interests, alongside the interests of the organisation as a whole.

In the presentation of the other team members the 'diversity' of members, with strong personalities, good for the development of ideas for contributing to decision making. This re-presentation of the team members provided a high story of success and collegiality.

It was often stressed that the team was composed of very strong and diverse personalities. For example, RA summed up the 'management team' as follows:

> *RA: Well we've got quite a good cross section of people across the Union and err we've got very diverse personalities so we should be able to (slight pause) I suppose it depends upon what you're talking about really um I mean if it's a situation that arise I haven't I haven't met a situation in which I haven't felt that the team couldn't handle it (pause). But whether we're informed of all situations that goes on that's another matter (pause)*
>
> [Interview Deputy Finance Manager: 117-118]

This ‘diversity’ is portrayed as being beneficial for developing new perspectives. Again, this is something that is championed in the team literature (Katzenbach and Smith, 1993). However, as Janis (1982) points out, diversity can lead to disagreements if members are not able to incorporate and understand the diversity of opinions. What emerged from the observations was how distinctions were made between the different departmental backgrounds of members. In particular, the analysis engages with how these distinctions are being constructed continually and the impact of this process upon the team.

Low stories of division and marginalisation

But, as RA’s comments above also suggest, there are other narratives being told, which tell less of success and collegiality but of suspicion, division and marginalisation. For example, a significant discourse that emerged was ‘Democratic’ representation. This was drawn upon to explain apparent contradictions between the espoused theories and the theories-in-use. There were voices raised that expressed doubts over whether the contribution of all the members was encouraged by senior managers. Two members separately in different interviews pointed this out. BW suggested that “Some people, as with most organisations, will sit there with their mouths closed; other people feel strongly and will, on certain issues, have something to say”, although he also suggested that the decision making process is supposed to be democratic” it was “agreement by mutual consent, after being cleverly led towards the answer”.

Here, BW is drawing upon a ‘democratic’ social representation as a commonplace to describe the ‘team’. Drawing upon organisational learning discourse, he appears to be delineating between a perceived contradiction between the ‘espoused theory’ and ‘theory in use’ (Argyris and Schön, 1996). Similar sentiments emerged in a later interview, where the Deputy Shop Manager (CW) commented about the senior management team members that “Outwardly they want honesty in the feedback, but like everybody I suppose none of us likes criticism and I suppose you do feel that you can’t criticize. That's just a personal feeling though”.

Note that CW prefaces her words on input of members to re-evaluate strategy with 'personally' ensuring that these were not perceived as ‘official’ comments. Similarly, the remarks by BW categorising that this situation of certain member’s dominating ‘was usual’ is a recognised rhetorical technique in order to support ones perspective (Billig, 1991; Billig, 1996). This again shows the argumentative, double-sideness of dialogue, because the comment puts forward another voice (Bahktin, 1981), contradicting the critical comment. However, the comments of BW and CW reflect their attempts to tell stories that persuade the listener (the author) of their candour.

Split between members of the team and those on the corridor

Also part of this re-presenting of each other is a narrative thread that divided ‘Line’ from those ‘on the corridor’, in contrast to the re-presenting of the managers as a singe team. The

former divided the management team into two groups, the line managers and more senior managers with their offices on the corridor.

A division was made by RA later in her interview when she talks of the line managers in the team who and the other members of the management team, because the latter - in her opinion - did not "know either that they've got the power or have been issued with the power" to make decisions. This was made in respect to the lack of decision being made over the colour scheme of the new uniforms. In turn, these 'unknowing' line managers were increasingly annoyed that there was little feedback to the choice of colour scheme by the senior managers (as well as those from the finance office). These emotions arose in a separate retail managers' meeting, following a lively interaction over the choice of uniforms, as presented by BW, who complained about his reception to the other retail managers that there was no positive reaction from the other managers, to which all the retail managers sympathised, CW commenting that the attitude of the managers 'on the corridor' had changed from enthusiasm to "the attitude of that 'give the minions something to Wear' " [Retail Manager's Meeting 2].

What is interesting to note that none of these references were made in the team meetings themselves. Seemingly, when performing in that situation, managers tend not to draw upon this 'commonplace'. Instead, it is drawn upon in different contexts; for example, in order to engender sense of shared injustice amongst the retail managers. Effectively, those 'in the corridor' acts as a metonym for those who do not understand or support the position of the retail managers, constructing an emotional appeal that is engendering sense of injustice (Hamilton, 1997). Therefore, on the one hand, this is a particularization, namely the metonym noting specific characteristics. Yet, on the other, through the use of this strategy, the retail managers are forming categorisations, beginning to objectify the opposition to what BW described as the retail managers 'team', that engenders a 'common sense' a sense of teamness. Other concerns were raised by the retail managers over rumours – unconfirmed by senior managers in the monthly meetings – which suggested the Union Shop was going to be moved by the landlord (the University). This issue produced an emotional dimension apparent in an interview later the same week.

> *CW: It just kept being passed on and we get told that "you know as much as we do". But we don't believe that I'm afraid. It might well be true but we can't believe that they don't know anymore. Because why don't they know any more? It's just probably unfair but when it effects you very personally then you are looking and saying why aren't you going and grabbing someone round the throat and saying what's happening. It is almost as if it was complacency you know as if we can't get anymore out of them so we will give up fighting. That's what I find very uncomfortable.*
>
> [Interview Deputy Manager Union Shop: 90-93]

The emotions here are palpable, reflecting a tragic tale of middle managers caught 'between the millstones' of senior management and threatening environment (Sims, 2003). But, the further references to the Senior Managers as a separate group. In an interview early

on in the research, PH spoke to me quite candidly about his opinions of the managers in the Union:

> *PH: In any organisation I think you find there are people who've worked there for a very long time. Then you get others who've come in to the organisation with new ideas, and I think that those who've been there a long time need to be made aware of what is going on outside, of other changes, otherwise they see these ideas as being just a fad. I think when they have visited other places and seen them, they see that they are not so ridiculous and as a result of that they see that they are basically common sense*
>
> [Interview with General Manager: 28]

PH here is re-presenting the Union in a particular way; categorising the Union as 'any organization', with the insular old hands and the new people with 'new ideas'. The former are re-presented as needing to 'be made aware', being politely shown as 'out of touch' with changes. This is drawing up and upon a social representation signifying the need for change, growth and progression, not unlike the discourses employed by managers trying to implement changes elsewhere (See Gabriel, 2000; Watson, 1994).

Distinctions were being drawn between those who are team members and those who are not. JH and CW were both removed from the 'Management Team' towards the end of the ethnography. The reason given for this because they did not have the right competencies, as the General Manager commented in a meeting "Well when you're dealing with the Executive and the University you've got to have the right competences". This perceived lack of 'competences' links in with those criticisms made earlier: that the line managers were unable to present themselves as decision makers.

Discussion

Therefore, there was a difference in the stories being told. The epic stories of overcoming barriers and moving forward, as opposed to the rather gloomier scenario put forward elsewhere. Indeed, these contrasting stories can emerge from the same individual. Therefore, there are multiple stories emerging from the author analysis, which are not necessary centred upon specific individual authors. This situation is common to findings in other ethnographies (Jeffcutt, 1994). It also supports the distinction made between the canonical practice, as espoused in handbooks etc. and the non-canonical practice, which emerges from the detailed stories produced by participants (Brown and Duguid, 1991). This is not to say that one story is 'wrong' and the other 'right' *per se*. What is important is the way in which, and the degree of success that these stories have, in attempting to persuade the audience (the author as researcher) of the validity of their content.

Social Function of the Dance: Making in Common

It is interesting to note that impact of the collective emotions generated within the management team. Noticeably, in meetings, when faced with particular situations, the team would collectively 'pull together' in the face of perceived common threats (de Dreu, et al, 2004). From a rhetorical perspective, it is possible to investigate the processes through which participants drew up and upon particular representational elements in order to engender this commonality.

What is significant is that this process of defining the social context, of community-construction does not necessarily lead to a homogeneous collective. Whilst they pull together in the face of potential threats, the line managers and the senior managers divide elsewhere.

From this, what emerges is how this storytelling is an ongoing process - one which both unifies and divides. It unifies because shared communities are formed through dialogue to address emergent issues and form knowing 'in common' (Bohm, 1996). Indeed, it identifies how multiple communities extend beyond specific formal team or departmental boundaries (Wenger, 2000). The retail managers join in with the stories re-presenting themselves as undeserving victims (Gabriel, 2000), the members of the sub-team meetings understand the problems of re-presenting the Union as 'non-political' and the dominance of the student executive. However, it reveals how this process of divides, how these storytelling activities also define boundaries that exclude participants with a major impact upon the actors own identities and position within team and organization.

Measured Steps: Univocality over Multivocality?

Critics of the utopianism of team learning research has highlighted how only certain stories are represented (Contu et al, 2003; Coopey, 1995). Alternatively, by drawing from post-modern influenced research into organisational learning, it can be seen in this paper that engaging with the multivocality of learning requires that we investigate multifarious stories.

Integral to this storytelling process is how boundaries are created, sustained and overcome in practice. It explores how collective identities of team, team member organizational 'culture' are re-presented through a variety of rhetorical storytelling devices. Therefore, storytelling is seen here *not as superficial but fundamental* to the development, exploration and sustaining of shared representations at the heart of collective learning (Boje, 1994).

But, in doing so, this paper investigates how stories both interact and conflict as shared representations of reality are formed. For instance, noting how certain stories can actually dominate as monologues "that seek to achieve authority and persuasion through the suppression and proscription of dialogue" (Jeffcutt, 1990: 250). This begins to shed further light onto the major common criticism of implementing collective learning methodologies – how they can fail to achieve improved performance because of the predominance of particular interests (Coopey, 1995; Jackson, 2000; Owenby, 2002). Hence, the low stories told by the line managers; over the inflexiblity of staff members, the impracticality of introducing the

appraisal systems of the new 'learning culture', are refuted at times, to the point where criticisms have to be rewritten.

The privileging of particular re-presentations of what constitutes 'learning' – the reliance upon recording information for Investors in People accreditation, for example – mirrors criticisms of organizational learning's privileging of abstract knowledge (Niconlini and Meznar, 1995), of learning as merely acquisition (Elkjaer, 2004). Indeed, it was difficult to refute the re-presenting of 'learning culture' because of the constructing of this social representation; drawing upon other representations to anchor it securely. As the team learning literature suggests, a critical dimension is the impact that a 'learning team' can have upon the wider organisation, defining good practice upon other teams (Senge, 1992). The Union departmental teams, middle management and non-managerial are drawn into the re-presenting of a 'learning culture' to the Investors in People assessors, not necessarily detrimental for the organisation to speak with 'one voice' in order to gain accreditation and support from outside bodies. However, the question is whether this de-privileges informal knowledge, or even inhibits critical thinking as certain issues are rendered 'undiscussible'.

The Emotions within Performance

According to two leading theorists about emotions in organisation "Learning in the context of emotion implies a change in position, a reconstruction of one's way of perceiving and thinking" (Antonacopoulou and Gabriel, 2001: 442), this challenges research to engage with how individuals cope when faced with situations which confront their acquired worldviews.

In this paper, the interrelationship between learning and emotion has been revealed in a number of ways. Firstly, as the extant literature suggests, the process of exploring and challenging particular complex issues has triggered emotional responses (Senge, 1992). Indeed, the suppression of certain issues: for example, the muted dialogue surrounding the shop move or perceived 'sneering attitudes' from senior managers resulting in outbursts. This links with the more psychodynamic view with its 'inside out' appreciation of emotion as emerging from "an inner world of passion, ambivalence and contradiction which may be experienced or repressed, expressed or controlled, diffused or diluted, but never actually obliterated" (Antonacopoulou and Gabriel, 2001: 438).

However, secondly, this paper has followed a more constructionist view emphasises emotions as social phenomena, the contextual culturally-mediated display of personal feelings, calling attention to how emotions are performed within the arena of a management team. For example, permitting investigation into how participants are able to manage and regulate emotions in self and others, perceive emotion in others and express one's emotions; how to use emotions to guide thinking in self and others, indicators of emotional intelligence (Sy and Cote, 2004).

Thirdly, by engaging with the emotional import of collective learning, it is possible to see that those processes involved in appealing to particular social representations. As Hamilton

(1997) points out, any culture change initiative requires the engagement of not only the 'rational', but the affective as well.

Becoming Part of the Storytelling: The Importance of a rhetorical perspective

This paper does not refute the dialogic rationality espoused in the extant team learning literature *per se*, it engages with how reason is constructed through dialogue (Myerson, 1994). This rhetorical sensitivity permits a deeper investigation into the productive reasoning that is so central to collective learning (Argyris and Schön, 1996): how speakers make their reasoning comprehensible, explicit, in order to support their argument. Indeed, it engages with a more dynamic, constructionist view of systemic thought as "to cause to stand together" (Senge et al, 1995: 90). The key difference being that rather than merely assuming that there is an *a priori* underlying structure, a criticism of the extant theorising (Elkjaer, 2004), it is possible to see how these social representations are drawn up objectified through interactions: how social worlds are *made* rather than merely *revealed*. The rhetorical work put into defining the system; by drawing up and upon specific social representations allows insight into the complex argumentative nature of dialogue, the two-sideness of human reasoning (Billig, 1996).

There was evidence in how participants acknowledged the limitations in describing themselves. Particularly in interviews, an understanding of how they are 'expected to behave' as team members; or at least, how they suspect that they are meant to behave. Mary-Jo Hatch notes how the existing conceptualisation of 'team learning' is beneficial because it highlights the need for participants to appreciate their own constructing of worlds (Hatch, 1997). So that participants become "*observers of their own thinking*" (Senge, 1992: 242). It is this apparent reflexivity which emerges in the data analysis. There were many comments in which seemingly this 'observation of thinking' was taking place. Examples arose in meetings as participants attempted to make sense of the identity of themselves as a team, or as a Union.

In turn, this reflexive aspect impacts upon myself as observer, something which can be seen through the rhetorical perspective. For instance, the attempts made to connect with myself – as audience member – to mangers in both meetings and one on one interviews.

Indeed, the reverse is evident as well. There were instances in which managers deliberately attempted to limit the author's participation: preventing me from writing notes in meetings at particularly sensitive points, for example.

Conclusions

This paper, although critical of some of the extant literature, actually suggests a return to the fundamental roots of the latter. This empirical investigation reveals that a critical revision of extant theorising is required. Whilst supporting the view that collective learning is based upon a flow of sensemaking - the dynamic 'meaning flowing through' of dialogue (Issacs,

1993) it is suggested that now *a more explicitly processual* understanding of this dynamic would be more insightful – highlighting how learning and knowing are inextricably entwined through practice (see Gherardi and Nicolini, 2002; Wenger, 2000). This paper does not assume to have a complete representation of these complex processes; it produces 'partial connections' (Strathern, 1991), but the key point is that it engages with the argumentation in this flow of meaning to investigate how dialogue is channelled through argumentation to sustain particular constructions of reality and – conversely – how this can lead to the silencing of other voices.

In this way, the focus upon the *rationality* of dialogue is counter balanced by the integral role of *emotions* in collective learning. Much has been written on dialogic techniques that unlock learningful thought from its emotional constraints (Isaacs, 1993). However, whilst acknowledging the merits of this reasoning, it is proposed that this 'rationalist' perspective can limit our understanding of the dialogic processes of collective learning. Indeed, it is argued that a more rounded comprehension of the emotional and rational import of these rhetorical techniques is required (Billig, 1996; Myerson, 1994).

In summary, this paper empirically and theoretically draws together a critical revaluation of learning in organisations. It supports an understanding of the passion of learning through the interrelationship of formal and informal rhetorical storytelling processes (Gherardi and Nicolini, 2002). Also it unravels how the privileging of certain narratives favours those who labour to construct them, and how they define not only what is 'learning' and 'knowing' but the roles and identities of the participants. By highlighting how this privileging marginalises other voices; this paper demonstrates the passionate nature of learning, which it has been suggested, is so often ignored by the extant collective learning research (Vince and Saleem, 2004).

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Appendix: A list of the names Used in the Paper

Senior Managers:
PH: General Manager
JD: Finance and Administration Manager
GC Property and Services Manager
MP: Training and Personnel Manager
Retail Managers:
CWD: Administration Manager
BW: Commercial Adviser
CW: Deputy Manager [Union Shop]
JH: Temporary Bars Manager
Other Managers:
RA: Deputy Finance Manager
JW: Advice Centre Manager

Endnotes

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[2] The four senior managers being the General Manager [PH], Training and Personnel Manager [MP], the Finance and Administration Manager[JD] and the Property and Services Manager [GC]

Medical Cultures and Medical Knowledge in Developmental Contexts

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Knowledge and Development

Development -a normative concept whose meaning is deeply rooted in the idea of progress- is a widely legitimated field of activity. It became highly ramified, as there are economical, human, social, cultural, political developments, depending on which element is more stressed. Beyond differences, the common meaning of the word implies that oriented social change is conceived as a desirable and morally legitimate improvement.

In latest years, knowledge has become a key concept in rewording and reframing development projects; so knowledge is strongly oriented towards ends. In this research, less instrumental aspects of knowledge are considered in studying the implementation of a telemedicine service in a province of the High Amazon.

Contemporary emphasis on knowledge has made it a widely used (and maybe fashionable) instrument to promote development nearly wherever in the world. This goes on side by side with the spread of information and communication technologies. ICT are the basic ingredients for nowadays recipes to promote development in the so called "Third World": educational, medical, market, administrative institutions have become knowledge-intensive and coherently redefined their priorities, strategic plans, organized actions, and ICT implementations. Through those processes, information and communication technologies affect constructions of reality, social relations, contexts and perceived senses of normality. In this field -as in knowledge management- it is usual a reification of knowledge, which is reduced to transmittable information and expected to be universal. This prevents from understanding some aspects of the two-ways relation between actors, ICT-artifacts, and knowledge. It is quite common for knowledge-driven development projects to be active in contexts where there is not a dominant knowledge of what they are dealing with (and if there is, usually it is not theirs).

Both ICT and development are legitimized fields of research and intervention, my aim is to show that their points of intersection -(at least rhetorically) linked by knowledge- can be relevant from an organizational perspective, and in questioning a well-established development approach. For that, I have focused on health, which is one of the main issues in development contexts, whose improvement is pursued through telemedicine systems, too.

Telemedicine for development is always implemented within health care system, whose organizational routines are designed on scientific medical knowledge. Telemedicine relies on, implies and promotes a formalized and universal conception of medical knowledge, although its adaptation to particular environments puts it in interplay with local knowledges, uses and practices.

Assumed universal rationality, and its utilitarian application, risks to make other knowledges invisible to development efforts, so unexpected side-effects arise and remains unexplained. Thus, it is relevant to understand more what happens when different knowledges

(medical knowledges in this case) co-exist in the same context, how they affect social actions, if boundaries emerge and how people deal with them.

It has to be noted that ICT-based projects failures are quite common. A usual response to this state of things is that in contexts in which people have difficulty in accessing basic needs, information is not a priority. My research work suspends the judgement about this issue, and aims to describe and understand a relevant case.

As ICT are a kind of artifact used to implement knowledge-based development efforts, they can be instruments of knowledge for the research, too, as far as they reveal or co-produce social aspects otherwise unseeable or impossible.

Framing the Issue

As telemedicine mediates medical knowledge, the empirical point of this paper is on the micro-level encounter of medical cultures and medical knowledge in a developmental context, in the Peruvian High Amazon, where a telemedicine system has been implemented upon the existing health care system since some years.

Is this information system for development an instrument of organizational learning and knowing? It can be in two meanings:

- providing information, it is supposed to produce an organizational improvement;
- it produces attention and interest for knowledge-related issues.

I do not pretend to give a satisfactory definition of knowledge, I just make explicit how I intend it in this work. Knowledge is the ability to do something, it is what is known by a person or group, and relies on experiences, information, skills, competences, and understanding. I do not rely on the common distinction between abstract and practical knowledge, as I assume that abstract knowledge is the practical ability to perform in a context that is expected to deal with abstract knowledge. Thus, I rely on a social theory of knowledge rather than on a cognitive one (which would lead to pay main attention to individual comprehension and synthesis). Therefore learning is conceived as the process of achieving capacity for effective action. In any case, I am not relating knowledge to reality or truth, but -again- on the ability to do something in a specific context.

Telemedicine as an Instrument of Knowing and Learning

Health development projects are based on scientific medical knowledge, this makes telemedicine the tool for this kind of goal-oriented actions. Telemedicine promises to permeate rural areas providing a synchronous and sharpened contact between doctors and patients, medical knowledge is supposed to become healing action potentially anywhere and anytime. The “good will” to improve health care in developing countries makes development promoters less sensitive to other medical knowledges which affect patients behaviors, mainly where there is not a hegemonic medicine.

I define telemedicine as the implementation and use of ICT for medical purposes. This means that technology is shaped for medical usage, and, on the other hand, that telemedicine is affected by the context and made up of intentions and expectations that inform related actions. Norman [1993], in his theory about distributed cognition, argues that most of the knowledge we have about the environments we live in, is embedded into the artifacts, not in mind. So that, a telemedicine system use different from expected can make us suspect that the local knowledge the system enters in interplay with, is different from promoters' one. In this sense this artifact is an artifact of knowledge for a study focused on knowledge. Telemedicine is an instrument of knowledge for the researcher, because it stresses and makes visible local aspects of medical knowledge and approach to development.

Therefore the implementation of telemedicine for development is relevant to be studied through qualitative methods as a point of encounter between diverse knowledges to look at what is invisible to this health development approach, and in order to search for answers to questions like: how do different medical knowledges meet? How are boundaries between healings created, sustained or overcome?

Two Lines of Analysis

My research has followed two main lines of analysis. One is centered on interorganizational legitimation between partners and actors involved in the project; it has been carried out through a documental study of their intra and interorganizational communications[2] and publications. The other line of research is based on an ethnographic study where the telemedicine system has been implemented, and the interplay with local context and patients. It has been enriched by interviews and focus groups.

Reflexive Elements

After an early keynote about my research I was told: "you do not come out of the jungle!" Minding that reality changes under observer's eyes, and the observer changes during the study process, it is important to make more explicit what I had been thinking about this research, what I knew, what I knew I did not, and what I expected to find out. For that, I briefly refer to a long interview which a colleague of mine did to me before the ethnographic study, while I was already taking part in promoters' online discussions. The general pre-understandings about the case-study I had in mind were:

- the organizational problems due to distances between hospital and health centers, physicians and population, and among health personnel (the initial aim of the project was to cut these distances)
- the presence of different medicines and local healers' activities;
- usual organizational studies assumptions (such as individual, rationality) could not be taken-for-granted

My main points of interests were:

- the possible lacks of understanding between involved actors;
- the interplay between scientific and local medicines.

Although the ethnography approach needs to be unstructured, the empirical points to look for relations between empirical situation and research questions were:

- how the telemedicine system was affecting the population's perception of public health care,
- problems faced by the project, and resistance from population and existing social relations,
- the information system in this context (design, implementation, uses),
- traditional treatments,
- knowledge circulation among culturally heterogeneous groups.

Telemedicine Project Legitimizing Network

The declared background motivation behind the project is to reduce the gap between "First" and "Third World", where most of people are unable to meet their basic needs. On the other hand, promoters declare that "society is advancing towards information and knowledge driven structures, where communications and information technologies play a crucial role in development, and may be key to effectively improve living conditions of broad sectors of left out population". Within this general frame, a "tremendous potential exists for improving health matters through the use of telecommunications and information technologies".

Those general principles drive to a more detailed introduction to this project approach. Promoters' network is constituted by a research group from a Spanish polytechnique, an international non-governmental organization, two Peruvian universities (one for medical, the other for technical matters), the High Amazonian branch of the health care system, funding and other supporting organizations. In order to be understood, the promoters' network cannot be reduced to formally interweaved agencies. Health care institution-building requires to mobilize hybrid networks (made up of actors, norms, agreements, expectations…) and to "align" them. The point is how ICT get legitimated to move agencies and become central for organized actions involving so many different actors. From the documental analysis on the online interorganizational communications and the main publications by this project promoters, these two main points emerge as the main sources of accountability that promoters, partners and other involved actors share:

- scientific medicine,
- ICT ability to diffuse medical knowledge and to improve organizations making them more flexible and accessible.

It means that the telemedicine system design and expected use reflect the routines implied by a scientific conception of illnesses and treatments (abstraction of symptoms, exams by a

physician, diagnosis, treatment and monitoring). Elements of those routines can be carried out remotely through the information system.

Those accountabilities reveal the common sense that promoters create and share, and that sustains and strengthens the project's social network in order to make effective telemedicine implementations for health development.

Knowledge and Information

I provide a brief theoretical frame for this source of accountability. In any communication two aspects can be seen: informational and relational. The first aspect implies a formalized knowledge, the second one tends to imply tacit knowledge and mutual understanding. So there is a dualism between universality and situatedness:

Informational aspects of communication	**Relational aspects of communication**
Formalized knowledge	Tacit knowledge
Science	Uses, practices
Universality	Situatedness

Tab. 1

When purposely implemented, I.C.T. rely on, imply and promote a rational and universal conception of knowledge (consistently with the left column, tab. 1). Any piece of knowledge formalized and legitimized by science (or by a science-looking reasoning) can be transmitted and it is supposed to be effective everywhere, although its adaptation to particular environments put them in interplay with local knowledges, uses, practices.[3] Local adaptations of ICT are processes usually left on the background, or a problem to overcome, at most.

Starting from the Telemedicine System

The rural part of the Peruvian health care system is divided into provinces. Each one has a central hospital to which several health centers refer to. Some health posts, which are smaller and usually run by nurses, depend on health centers. In the province of High Amazon where this system has been implemented, there are more than one hundred health centers and posts depending (directly or indirectly) on the local hospital. Half of them have been connected through voice and data communication channels three years before I started the ethnography.

A typical day in the communication central office begins by checking who is "online" in the health centers and reading them official messages arriving as sealed papers from the hospital administration. Who cannot be reached will be informed some time later. Who has no radio will be notified when in the hospital, or when somebody goes there. Information is supposed to circulate in real-time, but some piece of information can take up to five days or more to arrive from the upper level of the hierarchy to health care practitioners working in distant centers.

During the morning there is always a number of physicians and officers in this room, dealing with what happened during the previous night, asking for information from remote health centers, being asked confirmations about reception of what sent by boat. Sometimes remote consultations are required, even if it is clear the difficulty to interpret patients' conditions when instruments to produce clinical data lack onsite. Communications to support medical activity logistically (maybe to organize a safer and faster patient's transport to the hospital) are more frequent.

Health posts have to send periodically many reports (about their activities, needs of medicines, health condition of the population, of specific patients…), officers and doctors in the hospital spend a great deal of time in checking and confirming data. The accounts are always and exclusively oriented towards upper hierarchical levels, in two months I did not see any attempt to give a justification to who has not more power or influence (patients, for example).

Even when it was not directly asked, most of the personnel interviewed declared to perceive an increased monitoring due to the information system: phone and radio are often used to check everything's state. Coherently, the email is not really appreciated because "you never know if an email has arrived and been read, you don't know when you will be replied, and if not, why", said an employee of the epidemiology office. Before the introduction of electronic communication channels, all messages had to travel along rivers, this was taking long time, the information could be lost or not sent, it was difficult to be requested and its absence always justifiable. The electronic communication network has not increased the quantity of information officially required, but is cutting the possibility to justify missing information. E-mail, is not perceived as reliable, requires a bigger shift from routine activity than voice communication and, most of all, does not allow to "feel the others". Thus it is mainly used to transmit data whose process of formalization was already rooted into previous bureaucratic paper forms.

The telemedicine system can improve health care delivering information to ease a scientific decision-making for any patient (nurses can consult remote specialized personnel), but: firstly, lower level personnel do not always welcome a system that allows them to be more controlled, and secondly, the problem of laboratory instruments' lack to produce clinical data on-site cannot be solved by a communication channel. The information system is also starting to be used for distant education, that cannot be delivered through other means. Some radio conferences are delivered from the provincial hospital; via email, courses are sent from

a partner university to health personnel working in this region of Amazon. The promoters' concern is analogous: they cannot know very much about reception and effect of their messages.

Interviews and direct observation revealed a difference between what the information system is declared to be used:

1. for remote consulting,
2. to send activity and epidemiological reports,
3. to coordinate patients' transportations.

and the actual use:

1. to support medical activities logistically (a few consultations),
2. to coordinate and track any transportation through rivers (documents, blood samples, patients, gasoline, medicines),
3. to send reports.

It can be noted that the declared use of the system is rational, focused on medical activity, and supposed to rely on a formalized and efficient organization; the observed one reflects some of the concrete problems that daily medical activity has to face there. At this point of observation, the main reasons seemed to be:

- lack of trust, everything is double-checked because people do not confide the others achieve their tasks;
- insecurity, the difficult environment always interfere with activities and make people doubtful;
- low resources oblige to improvise solutions to solve problems;
- weak infrastructures make communication channels used to replace them, as far as possible;
- lower level personnel do not always welcome a system that allows them to be more controlled;
- the problem of laboratory instruments' lack to produce clinical data in health post and centers cannot be solved by a communication channel.

Is it enough to understand how different knowledges encounter? What happens beyond the information systems that is not perceptible through the information system itself? Why do patients arrive often late to the health centers? Appropriate answers could not be found within the hospital, but observing directly if and how people and system are mutually affected.

Co-existing Different Medicines

Then the ethnographic study continued in some communities. There I encountered different kinds of healing (based on plants, science, rituals). At the beginning it was not easy to know what patients do before going to a health post (here it is relevant because patients' late arrivals affect heavily the way health system have to deal with them). I was identified

with public health care and I was told and shown what was supposed to be coherent with my perspective.

Use of plants

In the communities, it took a while to suspect and then confirm that plants are the first cure. Direct questions like: "do you use plants?" provoked negative responses. When I learnt something about the use of plants, it changed: "do you take honey and lemon for cough?", "Yes, sometimes, but I prefer mint", for example. Implying some common knowledge my inquiries were more successful. Even if I did not develop a knowledge about use of plants in healing, I learnt enough to ask questions about their behaviors and discuss about them. Refreshing drinks are drunk for fevers, bananas and lemon for diarrhea; furthermore hot/cold equilibrium seems a reason why neither healthy nor sick people like to boil water (although strongly suggested): water is to refresh, boiled water (which tastes different) looses its effect. To clean the body, there are treatments based on strong disinfecting plants ("ojé", "uñas de gato" used for cancer, too), on plants that provoke vomit and/or on long fasts. These remedies are suggested by relatives and neighbors, cultivated in back-gardens or found in the jungle (experienced people use to help in that search). Patients use to go to health posts (if they do) if home-made medicines (based on plants) are not effective. It always takes some time, from two to ten days, more or less, plus the time to arrive to a health center that can be days away (traveling on foot and/or by canoes). Thus, they have to be transported to the hospital more frequently than if they arrived earlier.

The links between diseases and cures are always justified either balancing cold and hot, or cleaning the inner part of the body.

Scientific medicine

During a focus group, a physician from a village three days away from the hospital, whose population is mainly native, was complaining about the delay between first symptoms and patients' arrival to his health post. They can arrive with two or three weeks infections, so he faces big problems in the diagnosis, because of the lack of instruments, and in treating, because he has a limited set of medicines and there is no medical literature on how they interact with the vegetal medicines patients use to take.

From the patients' standpoint, the obstacles they have to overcome to go to a health center are not only geographical: she or he will be asked to abstract in words symptoms from their physical condition (native women do not even talk to unknown people without partner's permission, and usually do not know Spanish), probably they will have to pay (although money lacks and the sort of interchange it implies is quite unfamiliar to them).

In communities where the majority of the population is "mestiza", the delay is usually shorter, between two and ten days, probably for a weaker sense of diverse ethnical belonging.

Anyway it happens in nearly all centers that patients arrive late, and sometimes doctors and nurses have been accused of deaths of people arrived in serious conditions.

Here I am not going to describe the principles of the public health care system; I only remind that science is the legitimation and the source of accountability for this institution's healings. It does not mean that everyone shares this source of possible accounts, some patients said that they do not understand physicians' talks about diseases and medicines, others that they feel like not to have been understood (and usually avoid to say what could make doctors angry); on the other hand, doctors say that people should be more educated. Furthermore frequent doctors' change does not permit to develop a mutual understanding with local population. In consequence of this state of things, many patients do not pass through medical examinations, and prefer to go directly to the chemist's, who is somebody from the same community, usually.

A brief example, helps in understanding the difficulty for scientific thinking to shape everyday life: in a wooden, quite dark house it was impossible for a family (and for me, too) to see the dangerous mosquitoes' larvae a doctor was trying to show, in order to demonstrate the risks of stagnant water. That empirical evidence is not visible in their actual material environment, and not significant in their cultural space, because it implies an alignment of senses, objects (water, pipette, larvae, light), and thinking that is not effective. I do not mean such alignment will not be possible, but this example demonstrates that the spreading of scientific medicine is not just a matter of formal education or information transmission, but has to deal with the contexts and social environments people live in and constitute.

Local healers

What is very relevant is that illnesses that appear not to be treatable by plants and public health care, are perceived as due to others' hate. This is called "mal de gente" (disease provoked by people), or -more generally- "brujería" (witchcraft), and it is curable by local healers, only.

There are several kinds of healers, and many contrasting opinions about them, underlining their social relevance. They have a deep knowledge of the community they live in, and of people's beliefs and fears; on those levers they act using dreams, rites, symbolic objects, the magic. I cannot say if they use their influence instrumentally, and probably it is not a suitable perspective to understand their role. What is important to be said here is that people (and some health personnel, too) believe in their ability to treat, on the other hand they exert a strong social pressure over their communities. In some villages, people revealed in a low voice their fear to be made sick if they do not attend to local healers.

From my standpoint, because of the high incidence of illnesses in the area, and of the weaknesses of the health care system, the "mal de gente" is quite common, but what is really relevant is that this conceived-disease can be used -and it is used- to justify high children mortality, tensions among families of the same community (for economic reasons for

example) or other socially relevant facts. Local healers (are believed to) produce and treat this disease, and through that role, they can deeply affect social relations within their communities, and make actions and situations accountable. This provides them with a source of accountability which is a social regulator whose function is incommensurable with rational knowledge embedded in telemedicine-transmitted knowledge; it makes not linear the promoted and expected substitution by scientific medicine.

Diagnosis as Ex-Post Understanding

In scientific medicine's pattern of actions, a patient expresses the symptoms she or he feels, necessary clinical data are produced, then this information is related to a disease. This model works where scientific medicine is hegemonic, what happens where there are diverse medicines and none is dominant? As each medicine implies its own accountability, the treatment process -which usually goes through different medicines- is of particular interest.

A woman was waiting for a medical examination in a health care center. During an informal talk she explained that if pills, injections, syrups (the cures public health care system is identified with) have no effect, it is not a physical disease (the only ones health care system deals with). In this case the sickness must be due to envy, revenge, or egoism, and "you have to leave the health center as soon as possible to go to a local healer, the only person who can cure you." Even though quite blurred, it is recognizable a usual trajectory between diverse treatments patients go through: it starts from vegetal medicine, crosses the public health care system and ends to local healers. A priori, no medicine is believed to be the right one.

What struck me was that people's accounts and behaviors remain coherent with the kind of treatment they are using, although incoherent with other ones they used or will use. Vegetal, scientific, and magical treatments rely on different sources of accountability, and remain self-accountable. Each kind of cure implies a sense of normality for patients and their social contexts, the reasons to take a cure and to justify it, are coherent with a source of accountability that suggests means and addresses ends. In other words each treatment brings its own ethnomethods used to direct activities into normal patterns of action, and to justify them in case of need. Cross doubts are quite unusual.

As said before, the "mal de gente" is an illness that appears not to be treatable by plants and public health care. It does not correspond to any scientifically categorized disease, indeed -from my perspective- it is not a disease itself, it can be any serious illness that could not be cured so far, thus no diagnosis is possible a priori. Several counts and statements by patients and doctors, and some patients' irrational behaviors, confirmed that the understanding of the disease is a process co-extensive to patient's trajectory between different kind of treatments: the diagnosis is the product of the trajectory. More properly, the recovery says that the used medicine was right. My interpretation was not confirmed by local healers I spoke with, who were arguing that this disease itself exists, it is not just a label. To them, the trajectory through medicines is the lack of early understanding, rather then a process of diagnosing. This claim

supports the suitability of the concept of discourse to the situation, which will be discussed later.

Following the telemedicine system, I arrived to point out two findings: that scientific medical knowledge spreads as far as it keeps coherent with the perceptions and expectations from public health care system. Secondly the communication system is keeping the health personnel conception of health coherent with scientific medical knowledge, not simply controlling their activities. Indeed the terminals -and the possible communications they allow- make health personnel activities more accountable to hierarchically higher physicians (and therefore to scientific medicine) in front of patients. How do different medicines affect each other? There is not a clear direct relation and mutual influence between them, but the presence of other medicines (and their implied normal patterns of action) leaves to scientific medicine a limited space of activity. The development-in-use of the telemedicine services is affected by this interplay between medical knowledges.

Keeping on following the telemedicine system to describe the encounter of different knowledges, I note the public health care system is diffusing medical knowledge, but not transmitting it as information. The communication system is providing a stronger source of accountability rather than affecting directly medical activity through remote consultation or distant education.

Different Sources of Accountability rather than Different Rationalities

From the ethnography emerged that public health care is associated with quick recovery, and communication channels are strengthening this aspect. Moreover the communication system is keeping the health personnel's conception of health and activity coherent with scientific medical knowledge, not simply controlling their activities. Telemedicine is not changing scientific medicine perception, its use relies on the same source of accountability. The system and the local treatments are in indirect interplay; indeed the use of the communication channels is affected by the presence of other medicines, because they affect patients' use of the health care system, therefore the usage of the information system and the actual possibility to use it for consulting or accessing remote sources of information (knowledge sharing) between health personnel.

Avgerou [in Krishna and Madon, 2003] focuses her attention on information systems as hybrid networks, with a particular attention for ideas and institutionalized practices they imply and back. My participant observation suggests to pay the same attention to hybrid networks, ideas and institutionalized practices that co-exist in the context where the information system is implemented. The same author, in a previous work [2000], invites to recognize the mismatch between the scientific and economic rationalities that information systems usually embed and those which exist in development contexts, often dismissed as 'irrational'. Through a literature review, she advocates a shift from an universalistic and not-contextual notion of rationality to a conception of it as a way of reasoning arisen from

particular historical experiences (Western European). Her aim is not simply to see if different rationalities are conductive or not for ICT adoption, but to question the assumed supremacy of the technocratic and economic rationality over rationalities that may counteract it. To her, the point is that the rationality of Western modernity (Weber is pointed as the reference author) is instrumental in defining problems and addressing solutions, but quite ineffective in affecting actions to achieve such solutions.

Escobar [1995], following Foucault's critique to universal truths, analyzed the 'development' as a space of meaning and activity that construct and shape its objects. Ferguson [1994], on a similar line of thought, sees development projects as a kind of Trojan horse to affect political matters through pretended neutral actions. Avgerou [2002] argues that development through ICT is not a linear techno-rational process, although a few studies have addressed those issues.

From this general frame it is interesting to look at the model proposed by Heeks [et al., 1999] in order to evaluate health care information systems feasibility. Three rationalities are pointed out: technical, managerial and medical. All of them contribute to shape the information system and organizational change. The level of mismatch with empirical target reality helps in foreseeing the chance of success. Heeks [2004] refers to Latour's inscription concept in order to underline the non-neutrality of the information systems. The origin context is inscripted into information systems, thus the encounter with other actors-networks produces improvisation, adaptation, clash or abandonment.

This approach would lead to describe telemedicine system and its rationality rooted into scientific medicine reasoning, technological constraints and managerial issues. But it would not have been possible to do the same for other medical knowledges, because:

1. I cannot take-for-granted that cause-effect approach provides a suitable outlook on that;
2. methodologically, I cannot get other medical knowledges' inner logic, whereas accountability is accessible.

Referred to authors suggest to work on rationalities embedded or implied by information systems, whereas my data recollection showed that the rationality of the telemedicine system makes the declared use accountable, but it is not shaping its actual use. Considering the information system as a source of accountability which relates health personnel's activity to scientific medicine is more explicative of what happens on the ground.

To support that, I refer to Good [1994], whose work about illness in different cultures argues that illness understanding does not arise from a direct access to patients' state. Closer to this case-study: both patients and healers see the disease in the body, but a sick body is not a only physical object, it is part of the self and it is conceived accordingly with the social contexts patients live in. As the disease is not conceived the same by different knowledges, the problem is not only about translation into different words[4], because any sickness is experienced within different medicines. This phenomenological approach is fundamental to understand different medical knowledges encounter and how they affect health care. The same author accepts Foucault's concept of discourse, which is not made of signs, but of

practices that constitute the objects it deals with. Lupton [in Albrecht et al., 2000] writes: “there is not such a thing, therefore, as the purely 'natural' body, the body that may be separated from society and culture” [p.50] and argues that health, illness and disease, and health care can be viewed as socio-cultural products, pushing the analysis towards beliefs and meanings rather than physiological aspects.

Medical Discourses

From the proposed perspective, it is not suitable to look for subjects or objects of knowing. Knowledges are more coherently described by the concept of discourse. The health development process can be seen as an interplay between those medical discourses that patients go through during their recovery.

This suggested me to join ethnomethodology and the concept of discourse, in order to relate social perception of normality, action, thoughts, and accounts and to frame the production and change of accepted knowledges. A discourse is seen as a coherent space of meaning which actors’ decisions and actions are accountable to; discourses, based on common sources of accountability, make the social environment normal and understandable to the involved actors.

Medical discourses shape interweavings between artifacts, expectations, myths, accounts, and norms oriented to healing. Most of actors move through different ways of treatment, but discourses keep their inner coherence; discourses remain coherent although people’s actions do not. Thus, both the scientific medicine influence on local health practices and the telemedicine system use are evolving accordingly with how public health care service is perceived. Here is evident an anti-universalistic conception of medical knowledge, based on the assumption that scientific method is a source of truth and knowledge only where science has already arrived; otherwise it backs positions among others, so it cannot become action directly. Therefore medical (and other) discourses provide a frame to the production and change of accepted knowledges.[5] The “irrational” use scientific medicine is not due to ignorance, but affected by the continual production of supportive divergent knowledge. Indeed each healing is based on its particular “episteme” that backs a knowledge and a consequent experience of the illness: it addresses ways to conceive a disease and deal with it. Within a particular discourse, other treatments are meaningless, whereas they can be physically effective or counterproductive. As this is not accountable in developers’ actions and meaningless in development discourse, it is like it does not exist from developmental standpoint. Therefore considering multiple discourses and related sources of accountability offers a chance to relate this understanding to actors' practices within different epistemes, and to look at categories of ‘development’ critically.

Thompson [2004], through the discourse analysis of a speech given by the president of the World Bank, gives a clear example of the wider scale relevance of the "discourse" of ICT implementation, which is -in his opinion- reproducing the North American conception of development. Coherently with that, the Peruvian Health Care Ministry and international organizations such as Pan-American Health Organization and World Bank share similar main points of attention and sources of accountability with this telemedicine project promoters. It is seeable in their official publications and in the interest their working groups on telemedicine showed for this telemedicine project when I met them in Washington, D.C.

'Accountability' has (at least) two relevant meanings in this research: one is associated with the sense of normality that provides possible justifications in case of need, the other is the responsibility of an agency. Starting from the latter and applying it to this case, a simplified line of accountabilities can be drawn back from lower health care system hierarchical level up to the telemedicine project founders: due to the telemedicine system, health centers activity is more accountable to local hospital, hospital accountability is stressed by project partners and promoters, which are required to be accountable by international financers. It has to be noted that health personnel activity is required to be accountable to health institution rather than to patients. Then the other meaning: the sense of normal patterns of healing action that scientific medicine justifies and public health care system embeds is strengthened by the possible communication within the health organization. Therefore both aspects of accountability push scientific medical knowledge apart from patients.

On the other hand, sick people move between other medicines which are more accountable to local contexts they live and constitute (see local healers and "mal de gente"). This reduces scientific medicine area of influence and effectiveness, and do not allow a wide use of remote consulting (the main way for "knowledge sharing"). Those converging aspects lead to see the telemedicine system as the accountable infrastructure for the development discourse rather than a medium for medical knowledge.

Development as Producing Accountabilities on Expectations

In order to understand what is labeled 'development', I find relevant minding to heterogeneous medical knowledges coexisting on the ground of interventions. Looking at different medicines as self-accountable knowledge, provides a theoretically informed perspective on health development which departs from technocratic and ethnocentric approaches. It can highlight relations between power and knowledge which often pass unseen in development projects [Ferguson, 1994], due to their wide legitimation and theoretical approaches based on an abstract conception of knowledge.

Although it is a sustainable statement that technology and science are not teleological, both of them are eschatological in promising a better future (which is of main relevance in development contexts). Indeed this telemedicine project embodies expectations of health

development which are accountable to the possibilities of the system, and coherent with the common assumptions of development. But those shared expectations are not affecting health care matters in the planned way, they remain a widely referred to source of accountability that mismatches with the actual use and contextual situation.

The health development expectations -rather than the information system daily use- influence the common sense of normality. For example physicians do not rely on the knowledge interchanged on the information network, but feel more legitimate in their activity because they are potentially connected with their professional community. On the other hand, only a few patients are sensitive to this knowledge, and they go through health care system their own way, affected by other medical knowledges.

Thus, a paradox lived by this telemedicine project involved people can be noted: their activities are accountable to a system which supports scientific medical knowledge which is supposed to be normal, but it is not. More on the ground: local health is poor, health personnel actions become more accountable to scientific medicine because of the telemedicine provoked expectations. High expectations and risk of failure (and nothing accountable to go back to) produce the broadly spread sense of uncertainty. If the system does not work neither the new, nor the previous situations are accountable; the weak sense of normality is always risking to fall into disillusion and malcontent.

Development as Learning across Knowledge Boundaries?

I address some points to look at development in terms of organizational learning, keeping in mind the multivoicedness of this process that the case suggests. Since when development was conceived as industrialization, and pursued exporting machinery and building factories, studies about development discussed the idea of technology transfer, which is still quite common. In latest years, a similar approach goes under the label of knowledge transfer. Both of them are heavily affected by institution-building, that is aimed to provoke development creating organizations and institutions rather than focusing on economics. Most of these studies and projects are based on a rationalistic conception of organization, which does not see (or repress) other organizing processes. Another common approach to technology transfer is Diffusionism [Rogers 1995], that addresses existing social networks, opinion leaders and gatekeepers as the main channels to diffuse technology and innovation.

Organizational learning is a theoretical alternative to technical and rationalistic approaches to organizational change, and can shed new light on what main-stream approaches to development are blind to. The fundamentals of organizational learning are that knowing is situated (rejecting universal conceptions of knowledge). Therefore learning takes place in different contexts, and produce different knowledges. Rather than a transmission of knowledge, learning “happens” through communities of practice, as knowledge is constitutive of human and non-human elements alignments. For this case, it is relevant the conception of learning as the engagement in a set of practices, creating and destructing shared contexts: trial

and error, success and failure, discovery and invention processes leave aside rational choice and cognitive approaches. Joining a community of practice (healing in this case) would imply to be able to understand the boundaries of each medical knowledge.

Looking at this case-study through this theoretical posture, makes evident that the telemedicine system has been embedded within the existing health care system, and in some way it affected health personnel's community of practice. The telemedicine system is a sources of accountability for them, but patients and population -who are the rhetorical target of health development projects- are outside this practice and source of accountability. It seems there is not much organizational learning here, because there is a weak deconstruction and reconstruction of shared contexts, accountability comes from expectations rather than from practices.

Promoting organizational learning would imply to situate knowledge and ICT (or other artifacts) on the boundaries of different practices and sources of accountability and then "cultivating" social change. Health care would be a practice to be enacted rather than a problem to be solved, and healing ability an emergent property.

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Endnotes

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[2] I had been joining their mailing lists, which are the main instrument to communicate and coordinate the involved actors, who are active within different organizations and continents.

[3] Practice is a concept to refer to social actions and relationships, it is in-between action and habit, tacit and social, formalized and informal. Practice is a skilled performance situated in a social context. It has material and symbolic elements. Practice is here a central concept because it is in the practices that knowledge is embodied. Practices are resource and boundary of organized actions.

[4] Within the health care system the problem of mutual understanding is usually reduced to different languages spoken.

[5] I find fascinating the possibility to extend the understanding of discourses of vegetal and magical medicines. During a talk, arose the idea that "mal de gente" comes from colonial period: then, much more people died because of illnesses arrived from Europe than in fights. It is not senseless that the unknown and incurable perceived-illness (due to others' egoism or envy) was produced on social perception of health by Spanish conquest. To me, this perspective of study, sensitive to construction processes of present and future (without reproposing passionate economical and military analysis) is as attractive as difficult to support empirically.

Keeping the Lights On While Changing the Bulb: Exploring Knowledge, Learning and Change in Electricity Sector High Reliability Organizations

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Abstract

This paper explores organizational knowledge, learning and consequences for transformational change in two electricity sector 'High Reliability' cultures. A study of a British nuclear power station operator and a Canadian electricity grid operator examines the tensions between different conceptualizations of 'legitimate' organizational knowledge. The study data show that managers' socio-political processes to respond to stakeholder pressures for greater efficiency trigger actions to emphasize a preferred type of knowledge, which impedes generative types of organizational learning and transformational change. It is argued that transformational change in high reliability cultures requires a balanced approach to valuing different forms of knowledge and learning but based on the risks of catastrophic failure, in practice, this is easier said than done. The study findings raise a critical question on whether transformational change to significantly increase levels of efficiency can effectively take place in high reliability communities of practice without posing risks of exceeding social system limits.

Keywords: Organizational Knowledge, Organizational Learning, Transformational Change, High Reliability Organizations.

Roberts (1990a) defines high reliability organizations (HROs) as those where even a minor error in process may seriously hinder the very existence of the firm as well as the safety of external actors. Numerous studies have considered HROs along various dimensions, for example; leadership roles (Ruchlin *et al*., 2003), sense and reliability, (Coutu, 2003,) what HROs know (Gary, 2003), sensemaking (Weick, 2001), the problems of rationality, (Frederickson and LaPorte, 2002), management, (Roberts, 1990b), and culture (Bierly and Spender, 1995). Although these and other analyses have combined to help better understand HROs, one aspect of managing in an HRO environment has been given little attention. HROs are facing significant pressure to undergo transformational change. Transformational change is defined in this discussion as the type of change that depends on a shift in an individual's or groups' identity and action context. Burnes considers this type of change as being 'strategic and important' (2004: 323) and he distinguishes it in opposition to incremental change which is more closely associated with organizational fine-tuning and adjustment. Managing change in its various forms can be a challenge to organizations of any variety, (Burnes, 2004), however HROs may be set apart from efficiency organizations when attempting to manage change. Change endeavors cannot compromise HRO strategies to deliver safe, reliable

performance without exposing people and technology systems to potentially high levels of risk. For example, Roberts (1990b: 101) contends that:

> *Policy makers commit to nuclear power, struggle with the question of nuclear waste management, encourage the development of increasingly complex air traffic control systems, set forth plans for huge oil pipelines, and encourage the development of ever larger and more complex transportation systems for volatile chemicals and potentially pollutant petroleum. However, they fail to ask whether management strategies are sufficiently well developed to handle these challenging problems.*

Three common factors become apparent from Robert's contention that HRO management strategies should be examined to assess whether they can adequately produce transformational organizational change processes to bring about increased service efficiencies. First, owing to the potential dire consequences of errors, out of necessity HROs may treat rail or air travel arrival and departure times, for example, as secondary priorities in comparison to safety and reliability - the prime organizational directive rooted in high hazard operations. Second, the targets of change whether activity scheduling or customer care cannot divert organizational attention or key function resources away from the core high hazard operations. Third, since the organizations in question are HROs, for which as many authors have suggested (Smart *et al*., 2003; Weick, 2001; LaPorte and Consolini, 1996; Roberts, 1990a) contemporary management approaches and organizational theory is increasingly insufficient and incompatible, conventional change processes may not work.

Organizational change is essentially a learning process, which relies on different combinations of knowledge-action-outcome routines (March and Simon, 1993; Argyris and Schön, 1978; March and Olsen, 1975; Cyert and March, 1963). Because HRO processes are inextricably coupled with frequent change routines, which are often executed in uncertain conditions, learning and knowledge repertoires are central to this inquiry. For example, within HRO settings, learning by experimentation or trial is not an option without assuming potentially life-threatening risks. Weick (2001) suggests that organizations in which reliability is a more pressing issue than efficiency often have unique problems in learning and understanding. Weick believes substitutes are needed to replace learning by experience which cannot be a feasible option in HROs and suggests imagination, vicarious experiences, stories, simulations and other symbolic representations of the effects of technology need to be instituted in place of trial and error learning (Weick, 2001: 330, 331). At the same time, Weick asserts that simulated learning and knowledge processes can be problematic proxies for real-time actions. He relates the situation where air traffic controllers have to 'unlearn' (Hedberg, 1981) much that is learned during training. Training simulators do not accurately reflect change of speed in an airplane. When a change in airspeed occurs on the simulator the new speed is shown instantly whereas in real situations airplane speed changes more gradually. Weick argues that this shows simulation as a proxy for learning may offer only 'modest validity'. Further, he notes that simulated learning can also introduce new issues that might compromise reliability and safety as, "…people under pressure revert to their first-

learned ways of behaving" (1985; 2001: 331). How then do high reliability firms navigate the divide between maintaining reliable, safe operations as Weick and Sutcliffe (2001: 3) contend, "…under very trying conditions all the time and yet manage to have fewer than their fair share of accidents", and at the same time, transform themselves to become more efficient and 'lean' thinking? (Smart *et al.,* 2003)

The purpose of this paper is to better understand how knowledge and learning mediate high reliability transformational change. The mediating role of knowledge and learning is centred on the distinctive nature of undergoing change, while at the same time, diligently performing stable, routine practices or how high reliability firms learn to undergo transformational change without compromising their mission critical capabilities and relinquishing their safe, reliable operating effectiveness. This question will be tackled in two parts. First, firm-level knowledge and learning as mediating factors implicated in organizational change will be analyzed within the relevant extant literature. Second, an international study of two electricity industry high reliability organizations – a Canadian grid operator and a British nuclear power station operator is used to illustrate how actors' understanding of issues and constraints influence what they consider and value as 'legitimate' knowledge. It is argued that a balance in valuing different knowledge types is an important variable in both shaping how learning approaches are adopted in the study firms and also how these approaches relate to transformational change. Against this background, I will now turn to the relationships between organizational knowledge and learning and their attendant roles in catalyzing transformational change.

Organizational Knowledge, Learning and Change

Knowledge in its various dimensions has become a subject of emphasis by a number of authors especially over the past decade (Tsoukas and Mylonopoulos, 2004). Scholars have focused on knowledge creation (von Krogh, Ichijo and Nonaka, 2000), knowledge transfer (Dixon, 2000), knowledge and strategy (Zack, 1999), knowledge for action (Argyris, 1993) and on knowledge management (Davenport and Prusak, 1998). While perspectives are many and varied, a common thread within this knowledge literature treats knowledge itself as the central subject and de-emphasizes the socio-cultural processes that are necessary for the creation, implementation and translation (Yanow, 2004; Rouse and St. Amour, 2003) of knowledge and learning. The perspective adopted in this paper draws on Polanyi's (1966) work in which he defines knowledge as dynamic. Polanyi argues that knowledge is more appropriately considered as an *activity* – and could be described as a process of knowing in contrast to knowledge as an 'object' or 'commodity'.

In relation to what is meant by different types of knowledge, Choo (2002: 81) frames two important considerations about organizational knowledge that are not widely discussed in the knowledge literature. First, where many authors emphasize two dominant types as tacit and explicit (Despres and Chauvel, 2002), Choo argues that a firm has three kinds of knowledge:

- Tacit – located in the expertise and experience of individuals.
- Explicit – or rule-based knowledge in artifacts, rules and routines.
- Cultural – represented in the assumptions and beliefs used by members to assign value and significance to new information or knowledge. This knowledge type can trigger a test of the taken for granted assumptions that maintain firm-level 'legitimate' knowledge.

Second, Choo maintains that, "The creation of new knowledge involves the conversion, sharing and combination of all three types of knowledge" (2002: 79).

Organizational Learning Approaches

As with organizational knowledge, organizational learning has also been discussed extensively in the relevant literature. One way theorists consider organizational learning is by clustering the concept along contrasting lines with one set of approaches having to do with routine, incremental learning. The other set of approaches is associated more closely with innovative, transformational learning (St. Amour and Easterby-Smith, 2003). For example, Argyris and Schön (1978) refer to single and double-loop learning. Single-loop learning is said to take place when activities add to the knowledge base or firm-specific competencies or routines without altering the fundamental nature of the organization's existing governing variables or action strategies (Argyris and Schön, 1978). Fiol and Lyles (1985), consider single-loop learning as lower-level learning, whereas Senge (1990) views single-loop learning as related to adaptive learning or coping. Finally, Mason (1993) sees single-loop learning as non-strategic learning.

In contrast, double-loop learning occurs when, in addition to detection and correction of errors, organizational players consciously question and modify existing norms, procedures, policies, and objectives. A reflexive quality, which questions underlying assumptions, is implicated in these innovation-oriented approaches to learning. Double-loop learning involves changing the organization's knowledge base, firm-specific proficiency or routines (Dodgson, 1993). Double-loop learning is also called higher-level learning by Fiol and Lyles (1985), generative learning (or learning to expand an organization's capabilities) by Senge (1990), and strategic learning (Mason, 1993). Mason defines strategic learning as, "the process by which an organization makes sense of its environment in ways that broaden the range of objectives it can pursue or the range of resources and actions available to it for processing these objectives", (Mason, 1993: 843).

Examining learning and knowledge as dynamic, socio-political processes intends to inform an argument that while interrelated and interdependent, organizational knowledge and learning are not universal constructs. No single type of learning and any resulting knowledge is consistently right and valuable for firms that face turbulence and change (Weick, 2001; Hutchins, 1991). Rather, to be of value and to impart associated learning, organizational knowledge needs thought and deliberation to achieve a balance between its manifested

different forms. This balance, it will be argued, is essential for effective institutionalization of the type of knowledge and approach to learning that offers the highest prospect to produce transformational change. Further, knowledge and learning are socially created patterns of action (Bandura, 1986). For learning and knowledge to be channeled into some form of value delivery for a firm *intention* (Elkjaer, 2003) is necessary. This intentionality distinguishes *organizational* learning and knowledge from other forms. For example, Paechter (2001:167) discusses the common sense nature of everyday knowledge that sometimes is thought of as 'really useful' knowledge and differentiates this type from 'school knowledge' or the sort we learn from books and teachers. Students' knowledge gained from life experience is put aside since it is only the knowledge imparted from the teacher that is evaluated and assessed. Actors work to legitimize knowledge and in doing so overtly or covertly institutionalize an associated type of organizational learning which may or may not be right and valuable for a given situation. This conception differs from the view of knowledge and learning as related yet singular constructs where organizations are able to 'learn' and in learning, acquire some 'knowledge'. At issue is whether the learned knowledge is of the appropriate variety to deliver strategic value.

In the same way as Paechter's (2001) 'everyday knowledge' is not considered legitimate as 'school knowledge', certain types of knowledge may or may not be legitimate in organizational settings. This treatment of knowledge follows on Nonaka and Takeuchi's (1995: 58-9) contention that knowledge is essentially related to human action and that of Tsoukas and Vladimirou's, (2001: 974) conception of knowledge that it is both an *outcome* – 'a framework' – and a *process* for 'incorporating new experiences and information'. Law and Lodge (1984) profile the contentious nature of knowledge based on their study of social science knowledge. They argue that, "…all knowledge is directed in part by a concealed interest in social control, though this may coincide with an overt interest in prediction and control. Thus, to argue that certain knowledge – that directed by at least the former interest – is ideologically determined is unsatisfactory"(1984: 222).

The discussion that follows intends to illustrate that different actors attempt to legitimize a particular type of knowledge and approach to learning. These actions signal a knowledge type and associated approach to learning that coincide with an actor's self interests. At the same time, as will be seen from the study data, this tension over legitimate knowledge can generate incongruity between the forms considered of value and the forms used in practice. Different actors' valuation of legitimate knowledge is dependent on the following factors. First, on the particular knowledge *form*, whether tacit, explicit (Polanyi, 1966), or cultural (Choo, 2002). Second, on the knowledge *originator* determined by an actor's status or role within the organization. Third, knowledge *source* considers the place of origin or whether the knowledge originated within or outside the firm. Fourth, actors also scrutinize the knowledge creation *process* as particular methods of development are considered rightful and thus are deemed legitimate processes for creating, transferring or exploiting knowledge in comparison

to others. Finally the *content* or the knowledge itself is assessed as to its legitimacy in relation to how closely it fits an actor's interests (Law and Lodge, 1984).

Learning and Change

Various authors have commented on the important interrelatedness of learning and change. Lave and Wenger (1991: 57) for example, suggest "Learning, transformation, and change are always implicated in one another…", whereas Snell, (2001: 5) references the role of managers as stimulators of change and contends that a critical aspect of learning involves, " …managers engaging in 'generative learning', questioning basic assumptions about self and others, the nature of the organization and its environment". Sociologists Gherardi and Nicolini, (2003: 50) contend that, "…learning-in-organizing is not only a way to acquire knowledge in practice but also a way to change or perpetuate such knowledge…".

Newman and Nollen argue that not all organizational change is incremental and step-by-step or akin to learning by exploitation (March, 1991). The authors depict radical change as implying 'quantum and fundamental change in the firm's core values, as well as its strategies, structures, and capabilities' (Newman and Nollen, 1998: 47). Hence, the nature of transformational change in this paper is based on the requirement for a social system to shift both its context such as its history or embedded processes and its identity or its sense of self, in relation to others (Mead, 1934).

Research Setting

Weick and Sutcliffe give the examples of, "…power grid dispatching centres, air traffic control systems, nuclear aircraft carriers, nuclear power generating plants, hospital emergency departments, and hostage negotiation teams", as HROs (2001:3). Further, Perrow, (1986), describes the environment in which HROs operate as tightly coupled, complex and within highly interdependent technologies. LaPorte and Consolini (1991), similarly typify HROs as having two significant operating challenges which include first, managing complex, demanding technologies and in this environment making sure to avoid major failures, and second, maintaining the capacity for meeting periods of very high peak demand and production. Reliability in the electricity industry is a complex technical term with many meanings (Schulman, 1993). Here reliability is defined as a system operating at or near its level of capability. Smart *et al.,* (2003) shed light on the inherent tension between maintaining stable practices that are requisite for high reliability conditions and the pressures to increase levels of efficiency. The authors stress that management's overzealous adoption of lean thinking to reduce costs and enhance organizational efficiencies has resulted in severe diminishment of organizational slack. They argue that, paradoxically, it is precisely this slack that affords a firm the space to reflect, test assumptions and innovate – constructs crucial to advanced forms of learning and knowledge generation. Smart and his colleagues

advocate for integrating 'plausible alternatives' from the HRO literature in their call to integrate lean thinking and high reliability designs. Thus we see that for various scholars, high reliability theory promises bold new prospects for effective, reliable management of non-routine events. It follows then, that HROs should prove to be a rich target for the examination of knowledge, learning and change.

Methodology

Over a six year period, I conducted an ethnographic study of two companies with an emphasis on three groups in each organization – top leaders/managers, staff who perform 'core' operation functions and staff who perform support functions such as finance, human resources and customer service.

My review of the knowledge and learning, transformational change and high reliability literature did not yield any studies that centred on better understanding learning and knowledge as mediating factors in HRO transformational change. As no existing theory could be specifically utilized to support my study, I felt that any emergent theoretical construct had to be grounded in the research itself. A qualitative approach employing the constant comparative method of grounded theory (Strauss and Corbin, 1998) is therefore used. Data were gathered through participant observation and observing participation (Tedlock, 1991), ethnographic interviews that sought examples from past experience (Fielding and Fielding, 1985), writing reflective and observation-based memos and studying company documents. Over the period 1998 through 2004, three rounds of observation concentrated on the social processes and actions that surrounded six different organizational episodes. Each episode was intended to bring transformational change. Data were also collected from over 40 interviews with staff in both organizations from chief executive level through to power plant maintenance staff. Qualitative data analysis software (NVivo) was used to assist with coding the large volume of data. Open coding informed initial sampling considerations, however, as the study evolved axial coding was utilized. The data from both cases were fragmented and the concept properties, which emerged were then integrated by comparing data incidents. Over time, as data categories were subjected to constant comparison they became more discreet and selective.

As this paper aims to better understand how knowledge and learning mediate high reliability transformational change, which is centred on the distinctive nature of undergoing change while at the same time diligently performing stable, routine practices, different change processes serve as the phenomena of interpretation. Although six episodes of change were studied in total, for the purposes of brevity only two transformational change-related episodes are discussed in this paper. The first episode discusses GenerCo's bid to change its organizational culture to become more efficiency focused as a way to generate increased profits. The second episode describes PowerCo's attempt to change its culture from its historic situation where grid controllers were entirely central to the operation of the electricity

grid to the current situation where the process of deregulation has placed 'the market' at the core of effective grid operations. The examples are presented to illustrate how organizational knowledge is contested and to show the resulting consequences for learning approaches that are most closely aligned with transformational change. Moreover, the examples will be used to illustrate how managers in both organizations emphasize a certain type of knowledge and learning approach that is different from the type and approach emphasized by communities of practice. I will first present a short history and operating context for each organization.

GenerCo Corporate Operating Environment

GenerCo (a pseudonym) is Britain's largest generator of electricity and it was formed as part of the industry privatization in 1996. The company's principal activities are the generation, sale and trading of electricity. It is a leading supplier to industrial and commercial customers. GenerCo owns and operates eight nuclear power stations in the United Kingdom. Two nuclear power stations are situated at the research site. The adjacent stations share site infrastructure but largely operate as independent facilities. Each station employs about 450 people and each station contains two late 1980s vintage nuclear generators. GenerCo has had difficulties with low electricity prices as a result of market reforms. The drop in wholesale price and multiple, concurrent issues such as aging plant, the public acceptance of nuclear generation and a changing energy policy, have combined to create some uncertainty about the viability of the industry. Finally, some doubt exists in the marketplace as to whether GenerCo can operate for prolonged periods at high load factors (Harrison, 2005) – a notion that erodes confidence and contributes towards diminished shareholder investment. Although all of these are contributing factors in GenerCo's situation, the leadership team is preoccupied with culture change as the main solution to remedy the company's problems. This is done in the GenerCo vernacular of working to enhance 'human performance'.

PowerCo Background

In 1995, PowerCo (also a pseudonym) was created to operate the competitive wholesale market and the real-time generation dispatch in a Canadian province. Essentially, PowerCo operated the 'stock market' for buying and selling electricity at the wholesale level. As well, the company was responsible for managing the electric grid, which carries electricity between provinces and is interconnected with the United States.

Over 200 employees are spread across the main functional areas of grid and market operations. Control and coordination of the provincial electric power grid is one of PowerCo's key activities. The process of control and coordination is founded on balancing electricity supply with the demand on the system 24 hours a day year-round. Control room operators may dispatch power plants on or off the system and take steps to manage the 'flow' of electricity as part of their activities to achieve this balance.

Different Conceptions of Legitimate Knowledge versus Knowledge In Use

Control room operators in both GenerCo and PowerCo consistently refer to the importance of tacit knowledge styles throughout the study. By far, this form of knowledge emerged as the dominant form of knowledge used by control room operators in both firms. Operators reference words like 'art-form', 'feeling' and 'get a sense of things' when they describe their actions. Perhaps most significantly, and consistent with Polanyi's depiction of tacit knowledge, (1966) core workers are unaware that they possess and navigate with this type of knowledge in the first instance. This practice-based knowledge (Nicolini, Gherardi and Yanow, 2003), acquisition and implementation is consistent with community of practice learning processes. The following ethnographic narrative is intended to illustrate GenerCo management's commitment to reducing human error. The narrative illustrates the explicit nature of how management communicates to construct knowledge in contrast to the nature of practice based, tacit work.

> *...the human performance message shouts a complex mix of rules, regulations and precautions. The information proliferation starts at the visitor lodge. The hazard assessment level, drugs and alcohol policy, and security control zone statements are made obvious. Other notices inform that no mobile phones, no photos and no smoking are permitted. Visitors are reminded that closed circuit television is in operation and the toilet is closed until further notice. Line colour directions, the health and environment policy statement, the security team mandate, access policy, vehicle management policy and emergency liaison statements surround the customer care statement. The flood of information is pervasive regardless of a person's location on site. Moving from the leather couch in the executive leaders waiting area and on entering the boardroom, large posters at the front of the room spell out the10 Tools for Error Prevention and the 12 most common precursors to error or the 'dirty dozen'.*

Both GenerCo and PowerCo core function workers share common stories about how they make sense of their high reliability situations. The data show there is little difference between organizations in how control room operators value and use knowledge even though there are major differences in national cultures, age and size of organization and in financial performance. Nonetheless, in both GenerCo and PowerCo, the type of knowledge control room workers value and use and how this knowledge informs their learning is entirely consistent. For example, GenerCo nuclear station operator Robin explains the importance of tacit knowledge. He said:

> *If you were to look at the alarms that we receive in a morning shift of those 100 alarms, you'd probably find that 90 percent of them were dross…in that they weren't indicative of plant going wrong, they were just nuisance alarms. You may then find that a further 5 percent are maintenance functions so really our job is to act as the filter. To filter out what's dross and what's actual fact ...what is happening. And that's experience, it's the training. It's an awareness.*

Similarly, when asked how a person comes to understand the electric grid with all its complexities and the nature of unforeseen and uncertain variables, PowerCo control room operator Norbert said:

> *The system control room function, it's almost more of an art than a science sometimes. It's funny but you get a feeling that something isn't right and how do you qualify what that is? I remember one time…I was sitting at the grid desk and I had a feeling that things weren't quite right. And the superintendent comes along and he says, "What are you doing?" And I says, "I'm getting ready", I go, "I'm getting ready". "For what?" And he no sooner said 'for what', then we had a line trip. And I went over, closed the breaker and said, "For that".*

To this, Norbert adds his own, 'homegrown' version of how tacit knowledge is generated and diffuses within a practice setting. He uses the example of how members of an operating shift need to re-orient themselves and fine-tune their practices when they return from vacation. He says:

> *…to see the way that they're operating things, they've lost the fine touch, you know, the tweak here, the tweak there to make it work. But how do you get that? I guess it's kind of like being a cucumber in a pickle jar. Sooner or later you become a pickle.*

Although tacit knowledge is considered the dominant form in practice among control room operators, Norman, PowerCo's manager of operations indicates the importance of rule-based or procedural knowledge. When I asked him how new knowledge is cultivated to become embedded in practice, he says:

> *…two paths. There's the formal where either a current policy or procedure is revised [or created] or if it's the informal route then I'll provide direction to the controllers as a group on operating practice.*

The data show major discrepancies in the type of knowledge valued and used between control room operators and senior managers. Managers show a distinct preference for emphasizing explicit knowledge over tacit knowledge. For example, GenerCo station director Donald emphasizes the importance of proceduralized knowledge. He says:

> *Our long-term investment is about engineering out tomorrow's reliability problems… The major one that we're focusing on is people reliability. How do people make errors? We're making people stop and be challenged before even giving somebody a job…they go through a series of prompt cards*[2] *that say, "Have you done the job before?" Are there any critical steps in it? Do you know what they are? What would you do?*

Operations manager, Ivan echoes David's emphasis on procedures. Although Ivan was once an operator and can discuss the importance in balancing different types of knowledge and learning approaches, now as a manager, his focus is on demonstrating corporate performance results. Ivan's role includes being able to show effectiveness in control room operator training and improvement initiatives to meet higher levels of operator performance. Showing this evidence convincingly runs in contradiction to fostering environments where tacit, practice-based knowledge is the dominant form since tacit knowledge is difficult to

communicate (Polanyi, 1966). When asked how operators respond to power station alarms, he says:

> *What normally happens is they receive an alarm on some system and usually the alarm has a procedural reference next to it, so you get out the procedure and look at the procedures so this alarm is generated by such and such a thing and it will ask various questions in the procedure.*

When asked about how alarms are handled in practice, a different picture emerges. No mention is made about first consulting procedures as the main source of sensemaking. Rather social relations that inform tacit knowledge are referenced as a primary device for how alarms are handled. GenerCo control room operator Robert explains that:

> *…as a team, you'll sit back. You'll look at the alarms that you've received, you'll look at the plant indications that you've got, perhaps feedback from people who are outside that you've dispatched to go and have a look and then you'll formulate some sort of conclusions to what you think is going on. And then satisfy yourselves of the corrective action that is required. And that may take a few seconds, it may take a few minutes.*

Although some managers can acknowledge the merit and benefit of tacit knowledge in practice, there is little consistency among managers in how tacit knowledge could be integrated into control room operating repertoire. The following excerpt shows this incongruity. I asked station director, Donald this question:

> *I'm trying to think of a situation where there's an alarm, and there is nothing in the book [of procedures] on that?*

He responded with:

> *There can't be one. I can see changes in plant parameters which aren't great enough to generate an alarm…wonder why that's happened? But part of the training… one of the human performance things is if in doubt, take the conservative decision which brings you into a safe operational state.*

When I asked senior control room operator Mitchell the same question, he replied:

> *…there's always something that's going to catch you. Always something that's going to catch you. If that plant was one hundred percent predictable in its performance, I'd agree with you completely, but it isn't. There is always something. Off the wall. That nobody's thought of. And the trouble is that you've got lots of plant interacting. And the way it interacts…the permutations and combinations are just too big. You just can't…you can't document it.*

Mitchell's views resonate with GenerCo control room operator Robert. Robert again emphasizes the tacit and social nature of how the community acts in practice. During an interview at the power station, when I asked how his group would handle an alarm that was not codified and did not seem to make sense, he said:

> *…again, we'll fall back to a group discussion. This is quite often the scenario that…um…through all the best intentions, procedures, some procedures don't necessarily*

fit the alarms and the scenarios. It's trying to tell you a picture but it's a computer, it doesn't recognize all the dynamics of it.

Reliable Practices Bounded by Competing Knowledge Claims and Learning Approaches

Business objectives in both GenerCo and PowerCo, have shifted from their historic context. This significant shift is consistent with the circumstances that surround the need for transformational change. Management has changed the organizational business focus from the 'old world' of safety and reliability to the 'new world' concentration on efficiency-based profit and debt reduction in the case of GenerCo, and for PowerCo business today is about enabling the functioning of a market. In PowerCo's operating tradition grid controllers dispatched electric generating units from a monopoly fleet of power stations to meet system demand. Today, market forces dictate which units run on the system, based on lowest bid price. This action no longer puts the system controller at the centre of reliable electricity supply. Rather, it is the market price, which dictates which units are economically viable to operate. Maintaining a reliable power supply for consumers strictly on the basis of satisfying demand may be the traditional ideology, but in today's competitive market this sentiment on its own is perhaps not profitable. Claire is PowerCo's manager responsible to initiate the change where the marketplace is now central to industry operations. She says:

> *Because in their [traditionalists who view the operating mandate strictly as reliable supply] paradigm,… reliability is number one… all of that…that's all number one. Anything that jeopardizes or runs any risk to keeping the lights on and system integrity is a problem. Whereas if you're on the market side, you know a good blackout is a signal like anything else is a signal (price signal).*

For Claire, in strict economic terms, market forces up to the point of a system blackout would signal a price that would be attractive enough to encourage generators to contribute their electricity supply to the system. In contrast, some electric grid controllers consider the new order as a breach of their traditional values and a compromise in their identity as the stalwarts who 'keep the lights on'. For example, Dan, a PowerCo system controller says:

> *Well to me marketers and security [an element of system reliability] are totally different. They're two different worlds totally… Like the marketers are in it for the money. The operators here, the biggest thing they're concerned about is the security of the system that's what they're here for practically, to make things work, keep things held together. The marketers, they're there to make money. And I think they're two different things. So I don't know what I can add to that, I just think they are two different things totally.*

In the case of nuclear power station operator, GenerCo, management is working to institutionalize a culture change process to try and recover from the current financial problems. A vision statement, which embodies a new set of corporate values is central to this change. Corporate values are also an expression of the knowledge and learning that managers

deem important, thus legitimate. Jane is the GenerCo manager who leads the culture change initiative. She says, "It is good to see leadership support this. Change comes from the top first". Jane also said, "There are some skeptics". In response to the question of how staff are responding to the new vision, Jane explained:

> *We rolled out the new vision statement so employees could see how they could personalize it", Jane said. People like the new vision and they actually want to have pride in the station and the company".*

While Jane argues that people like and can affiliate with the modern vision statement, GenerCo control room operator Morris states:

> *I really think this (names vision) bit – is a thin veneer. You look beneath it – it's a can of worms. There is a real can of worms there.*

He goes on to explain that:

> *People don't think about it. I know the company would have us, "Safe, Profitable and Proud" (new mission statement)…for most of us, it doesn't matter. Profit does not interest us. When we're in the control room, profit does not get a mention - how much we could be taking.*

Managers Emphasis on Preferred Knowledge Type Signals Approach to Learning

Both GenerCo and PowerCo managers emphasize explicit knowledge as a main type that is valued and encouraged in the organizations. Procedures are developed as a structured guide to inform action. This occurs more so in GenerCo with its increased hazard potential as compared to PowerCo. Nonetheless, PowerCo managers express that they see an increase in developing more procedures in response to increased pressure to improve performance and reporting progress to satisfy stakeholder interests. In response to the prominence that managers place on explicit knowledge, organizational members adopt learning approaches that are single-loop, and thus, implicated in incremental changes. For example even though culture change is seen as important to senior managers, Jane the human resource manager responsible for the initiative considers it as an incremental adjustment. She says:

> *Our efforts on culture change are mostly of the routine, incremental sort. We're not doing massive change to innovate. We want to continuously improve our performance.*

Further evidence to show how managers' predilection towards a certain knowledge type shapes what is considered legitimate knowledge, is presented by PowerCo market operations manager, Claire. Claire's comment also illustrates her interpretation of the boundaries that become established by management's emphasis on a knowledge type that is valued and considered important, which influences an associated learning approach. She said:

> *...there's almost some epiphany where you realize, 'O.K., the following things are sacred and…so the following engineering and codified items are sacred and will not be jeopardized.*

Change Attempts as a Response to Pressures for Increased Efficiency

GenerCo and PowerCo managers indicate that stakeholder pressure for increased performance efficiency is central to the planned transformational changes in their organizations. They point to a multitude of performance indicators as evidence of a new pressure to measure efficiency. For example GenerCo maintenance leader Peter says he has:

> *Too many targets…150 performance indicators. We cope with a half dozen. This enables [a] management focus and clarity with the staff I've got. We focus because of what we've got to work with.*

Gina is GenerCo's head manager for safety. She argues that the company and industry focus on procedures in response to stakeholder pressure has become a dilemma. Managers focus on the measures and not on the action – the very point of the measurement in the first instance. She says:

> *More and more industry is trying to become proceduralized …to show what your procedures were. You lay down what your thoughts were and try to force people through trying to engineer the change process. Standardizing things versus [dealing with them as part of a] complex set of priorities so long as the problem has gone away or [it gets] done at a poor level of quality. [The result is] modifications are inadequately conceived and documented and the end product isn't fit for the purpose. [It is also about record management] If you have a problem, then you can now find it.*

For PowerCo a similar situation exists. The 2003 blackout in North America affected as many as 50 million customers in the United States and Canada, including a wide range of vital services and businesses. The U.S. General Accounting Office estimates the losses in the billions of dollars[3]. PowerCo control room operator, Dennis, explained during an interview that owing to the blackout, he felt increased pressure to document actions taken and the need to have evidence for decisions that he made. He said:

> *…basically [its] due diligence…so they can prove that they done the best they can to manage every situation. I think that's one of the reasons we're getting more and more policies written all the time. And as far as records …so many cases are going to end up in court…I guess down East (major outage August, 2003), will probably end up in court all over the place. And they better have records of everything that transpired throughout the whole time and…nobody wants to go to court but if a company is hauled in they better have good records of what took place.*

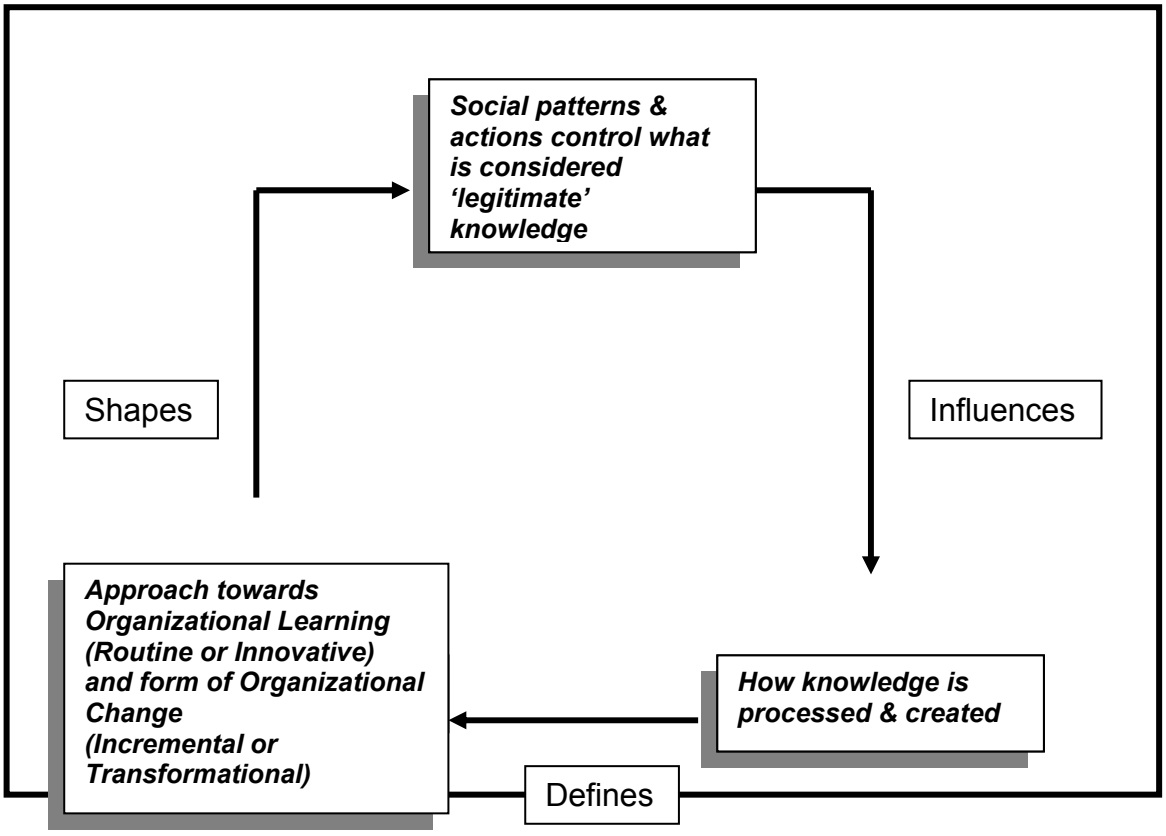
These major system events put increased demands on GenerCo and PowerCo managers to demonstrate they can deliver improved levels of reliability and increased efficiency. Large numbers of performance measurement indicators serve as the scorecard to stakeholders, regulators and customers that managers have the situation in hand.

Study Inferences and Implications

It is argued in this paper that balancing different forms of knowledge and learning is a central mediating factor in generating the requisite organizational learning approaches that hold the highest prospect to produce transformational change. Resistance to a firm's interest to create change has been attributed to organizational inertia, power-based conflict and clashes over deeply held beliefs, (Burnes, 2004). Little has been discussed about how closed-mindedness towards knowledge and learning can act as an impediment to producing transformational change in organizations. Moreover, changes in high reliability settings carry an added issue. If the focus on change through creating greater efficiency shifts away from the organization's traditional identity, which is rooted in the central tenet of high reliability, or 'mindfulness', (Weick and Roberts, 1993), the risks for potentially catastrophic failures might increase. Thus, managing change in HROs must, by necessity, be a careful balance, not only between knowledge and learning types, but also between maintaining safe, reliable practices, concurrent with changing to the desired future condition. Power and control are also implicated in organizational knowledge, learning and transformational change in a significant way. GenerCo and PowerCo managers utilize authoritative power and control to institute what they consider as legitimate knowledge in a bid to drive new learning and change. Not fostering a balance by emphasizing a particular type of knowledge, which promotes an associated approach to learning might prove unproductive in terms of meeting organizational survival goals and strategic interests in the long-term. As Starbuck suggests, radical transformational change, "takes organizations outside their familiar domains and alters bases of power" (1983: 99).

Choo (2002) refers to the need to integrate cultural knowledge with tacit and explicit forms though converging, sharing and combining the three forms of knowledge. This integration, he argues, is essential for creating new knowledge. New knowledge is foundational for organizational change. The foregoing research shows that by emphasizing explicit knowledge over tacit knowledge, managers in GenerCo and PowerCo signaled a particular form of knowledge as valued and important within the firm. In turn, a routine approach to organizational learning is influenced since routine learning (single-loop) is most closely associated with procedures and rules. Routine learning is also embedded in incremental change. Dunphy and Stace (1988) highlight the distinction between incremental and transformational change through following on Levy's model of first-order and second-order change. Levy suggests that first-order changes take place through incremental adjustments that do not alter the system's core. He contrasts this condition with second-order change, which involves an alteration of the system's fundamental governing rules (1986: 10).

Figure 1. *The Power, Knowledge and Learning/Change Loop*



Adapted from Scarbrough and Corbett (1992: 46)

Paradoxically, both GenerCo and PowerCo employ knowledge strategies to evoke routine learning, an approach most closely aligned with first-order, incremental change, yet both organizations are seeking major change to foundational systems including organizational vision, core values, identity and operating context. Change at this level requires innovative (double-loop) learning approaches so that taken for granted assumptions situated in basic governing rules are tested and changed (Levy, 1986). Routine learning approaches are insufficient to produce transformational level change. In both firms a predilection for a single knowledge type over a balanced approach to valuing and being open to different forms of knowledge, while testing underlying assumptions about taken for granted knowledge claims impedes innovative and generative learning. Cultural knowledge is manifest through an inclusive understanding – a balance of, and appreciation for, various knowledge types and learning approaches. It is the knowledge type most closely associated with testing underlying assumptions (Choo, 2002), and stimulating reflexive practices. These processes are seen as requisite for generative forms of learning (Stopford, 2001; Argyris and Schön, 1974) which are central to enabling transformational change. Various writers represent the importance of valuing different types of knowledge to stimulate a balanced approach to organizational

learning (Driver, 2002; Brown and Duguid, 2000; Crossan *et al.,* 1999). It is generally accepted that canonical and codified knowledge diffuses more rapidly and efficiently, (Kogut and Zander, 1992; Nonaka, 1994, Zander and Kogut, 1995). Nonetheless, the lack of balancing knowledge in different forms, employing reflective practices and valuing both routine and innovative approaches to learning eliminates the prospect for generative learning because the use of routine activities under differing conditions does not occur (Zollo and Winter, 1999). Thus, the prospect for new knowledge, which emerges from applying routine activities in new contexts, is eliminated and the capability to produce change is impeded.

This study is limited by at least two factors. First, while it is reasonable that the issues and management challenges of producing transformational change may be found at similar organizations, only two HROs were studied. Second, various authors argue that high reliability firms operate outside the boundaries of conventional organizational theory (Smart *et al*., 2003; Weick, 2001; LaPorte and Consolini, 1991; Roberts, 1990a). The problems with the knowledge and learning approaches that mediate transformational change explored in this research may be unique attributes of HROs. As such, conventional management theory may be insufficient to provide answers on how to effectively intervene to tackle the identified issues. Additional research might help to better understand whether the differences in valuing knowledge types and learning approaches exist in other HROs. Further research may also shed light on how management theory might aid in addressing the problems posed when organizational members hold incongruent knowledge and learning beliefs, shown in this study to be key dynamics that mediate transformational change.

Conclusion

High reliability organizations are under pressure to demonstrate that they are able to operate safely, reliably while controlling risks. Regulators and stakeholders are demanding more frequent reporting and increasingly stringent measures of performance by HROs to ensure public safety. At the same time, HROs are being pushed by shareholders and market players to become increasingly more efficient. Roberts (1990b) questions whether HRO management practices are sufficient to deal with these competing priorities. She also notes that traditional organizational theory is inadequate in its ability to offer HROs solutions to these problems.

Various authors (Driver, 2002; Weick, 2001; Brown and Duguid, 2000; Crossan *et al.,* 1999) argue that routine and innovative approaches to learning and knowledge types must be balanced. A balanced approach to valuing knowledge types and forms of learning, I suggest, serves as a vehicle for producing transformational organizational change. I argue that balance in knowledge types and forms of learning depend on understanding the way managers as agents of change respond to organizational issues and constraints. This research shows that for effective production of transformational change, change agents and those associated with

producing action, as targets of change, mutually understand and appreciate each other's knowledge repertoire. In the case of GenerCo, managers are pressured to

change and enhance efficiency levels in the name of increased profits. With PowerCo, the company change process requires that it give way to market forces, which means the traditional role of being the main operational catalyst for the power grid must be relinquished.

The study data indicate that the two HROs not only have unique problems in learning, as Weick (2001) implies, but they also have problems in undergoing transformational change. GenerCo and PowerCo management emphasize explicit forms of knowledge over tacit forms even though tacit knowledge is the dominant knowledge in practice. Management favours explicit, codified knowledge as the form that best demonstrates that organizational affairs are in-hand and under control by using a multitude of performance measures. Even though tacit knowledge is the dominant form used in practice, this form of knowledge is difficult to quantify and report against in response to pressure from stakeholders for greater control and more efficiency. Moreover, tacit knowledge is cannot easily be communicated (Polanyi, 1966). Cultural knowledge, (Choo, 2002), a type that examines taken for granted assumptions which is a necessary condition for transformational change because of its central feature of altering a firm's basic governing rules (Levy, 1986), is not prominent in either organization studied. Management's preoccupation with emphasizing the value of one knowledge type over others signals a preferred learning approach. In both companies, management advocates for explicit knowledge, which is closely linked to routine learning activities, single-loop, adaptive or lower-order forms of learning – or learning activities that are expected to deliver predictable outcomes. Management's preference for emphasizing one type of knowledge and learning creates an imbalance even though balancing different forms of knowledge and learning is deeply implicated with bringing about the necessary transformational change that management is trying to implement.

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[2] Prompt cards are plastic 'business card' size and are worn around workers necks on chains. The cards detail a series of questions to remind a worker about key steps and potential sources of error when doing a job.

[3] Data from the United States Senate Committee on Government Affairs referring to the *General Accounting Office Report on the 2003 Blackout*. http://www.gao.gov/new.items/d04204.pdf.

Social Delegitimisation of Learning: An Actor-Network Approach to 'Failure to Learn'

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Abstract

This research explores a situated view to institutionalised management learning, according to which 'failure to learn' is understood to be generated in a socially situated way within an organisational context. For that purpose, based on participant observation to an in-house management development programme in a Japanese organisation, this paper illustrates 1) how some participants in the programme became illegitimate learners under the unequal relations of power between the participants and the facilitators/the HRD group, and 2) how they experienced the programme as marginal actors, as it related to their dilemma and its consequences. Drawing on the ethnography, finally, this paper will point out the danger in focusing exclusively on 'success to learn', and argue that it is necessary to pay more attention to how 'failure to learn' is socially generated, in order to deepen our understanding of the situated nature of learning, and of its relation with people's passion for learning.

Introduction

Social Generation of 'Failure to Learn'

Since the late 1980s, a situated approach to learning has drawn our attention to the socially situated character of 'learning' beyond the contexts of formal schooling, education, and training (*e.g.* Brown and Duguid, 1991; Chaiklin and Lave, 1993; Gherardi *et. al.*, 1998; Lave, 1988, Lave and Wenger, 1991; Wenger, 1998). However, it does not necessarily lead to deepening our understanding of the situated nature of institutionalised learning in management education in universities or management development in business corporations. Especially, 'failure to learn' in institutionalised management learning is still often addressed in individualistic ways, and therefore attributed to individual factors involved in learners, such as inability or mental reluctance to engage in 'proper' activity for knowing and/or learning.

In contrast with this, the present research explores an alternative, socially situated, view, according to which 'failure to learn' is understood to be generated in a situated way by an institutional arrangement of management learning within an organisational context. That is to say, a socially-situated approach to 'failure to learn' should *not* be concerned with how a learner fails acquiring knowledge or skills, *but* with how a learner is *delegitimised* within an organisational context, as consequences of realising stakeholders' interests.

From this point of view, in the present research, an in-house management development programme in a Japanese company will be ethnographically illustrated as a case of the social generation of 'failure to learn' in institutionalised management learning.

Ethnographic Study of a Management Development Programme

The Management Development for Creative Marketing Planners (CMP)[1] was an in-house management development programme designed to make 'competent' marketing managers for *Japan Telecommunication Electronics Corporation (JTE corporation)*, one of the biggest computer manufacturers in Japan, carried out from July 1988 to June 2000, for 12 years. This was a one-year programme, from early in July to late in June the next year, and comprised 20 three-day workshops. One of the most characteristic features of the programme is that didactic pedagogy was taken to be inappropriate for 'practitioners' to learn. Accordingly, 'action research' (*e.g.* Checkland and Howell, 1998) was adopted as the pedagogy for CMP, and research projects were carried out by the participants in the programme. That is to say, the participants were expected to learn through the research projects. In addition, it was often emphasised that all the facilitators/tutors could do was not to guide the participants to succeed, but to support those who were eager to tackle 'real' problems in self-directed ways. As a result, the participants were also expected to learn how to learn in self-directed ways.

One of the HRD groups in JTE was responsible for the management of the programme in general. Five university-based researchers played the roles of designing the programme, facilitating the workshops, and supervising the participants' research projects. That is, the facilitator group consisted of the five researchers: three senior researchers were called 'facilitators' and two younger researchers were called 'tutors'. The different names showed the hierarchical order within the facilitator group. Although there was no ostensible difference between their roles in the programme, the tutors substantially did not have the initiative to decide important issues in the programme. In other words, the tutors were required to submit to playing the roles proposed by the facilitators, in particular in the situations of tutorials for the participants' research projects.

As mentioned above, the central activity for learning in CMP was the research project; 25 members of the participants were to form 5 groups of about 5 members, to propose plans for research projects for making marketing strategies, to carry them out, and to report the outputs of the projects to directors of the company. If the directors valued some of the outputs, these marketing strategies were to be implemented in the real businesses. This denoted that CMP was to be evaluated based on the outputs of the participants' research projects. Accordingly, the facilitators had a stake in the outputs, and their efforts were concentrated on achieving 'good' outputs. The facilitators enthusiastically instructed potential 'good' participants, while they often made light of potential 'bad' participants. In the light of the aim to achieve 'good' outputs in the research projects, potential 'bad' participants were marginal from the facilitators' viewpoint. It was the tutors' task to realise a 'soft landing' for potential 'bad' participants' research projects.

During the periods of the 9th and the 10th cohorts of CMP, from July 1996 to June 1998, as a tutor, I was in charge of tutorials exclusively for potential 'bad' participants. I spent the two cohorts of CMP together with them, and observed how they turned out to be 'failures to learn' within the context of legitimising CMP in the organisational setting. In this paper, based on

data obtained from my participant observation to the potential 'bad' participants and interviews with the stakeholders, and by applying some concepts of actor-network theory (ANT), I will explore the potential 'bad' participants' dilemma and its consequences in the organisational context of CMP, as they relate to the issue of 'failure to learn'. Especially, my concern in this paper is:

1) How some participants in the management development programme became illegitimate learners under the unequal relations of power between the participants and the facilitators/the HRD group, and
2) How the illegitimate learners experienced the management development programme as marginal actors, especially as it related to their dilemma concerning their passion for learning and its consequences.

Relations of Power between the Enrolling and the Enrolled

Model of Translation

The present research draws mainly on ANT for understanding a process of legitimising a management development programme within an organisational context. That is, in the light of ANT, a management development programme is taken as a collective practice to be accomplished by diverse actors, and is understood to be legitimised within an organisational context as a consequence of a successful chain of all the diverse actors being formed, which includes facilitators, HRD people, participants, and so on.

In terms of how a collective practice is accomplished by a successful chain of diverse actors, from the perspective of ANT, Callon (1986) proposes *the model of translation,* which is comprised of four stages: *'problematization'*, *'interessement'*, *'enrolment'*, *'mobilization'*. *Problematization* is the first stage, at which a group of actors define a collective practice to be achieved so as to satisfy the following two points: 1) the collective practice can be recognised as critical not only for the defining actors but also for others whose cooperation is necessary for realising the defining actors' interests; 2) the defining actors are indispensable to carrying out the collective practice. That is to say, this is a proposal not only for achieving a collective practice, but also for forming an alliance of stakeholders, in which the defining actors are to be situated in the indispensable position called *an obligatory passage point*. If the defining actors succeed in negotiating with others simultaneously over definition of the collective practice and over a new alliance of the stakeholders, those who propose *problematization* become *the protagonist actors* in a newly formed alliance of stakeholders. This stage of negotiation is called *interessement*.

However, in order to succeed in achieving the collective practice, protagonist actors are required to enrol other stakeholders as actors to cooperatively carry out the collective practice. Therefore, at the third stage of *enrolment*, the protagonist actors attempt various practices, including threat, persuasion, bargaining, and seducing, in order to define the interrelated roles necessary for accomplishing a collective practice, to attribute them to actors involved in the

alliance, and to lead the actors to play the defined roles. While the protagonist actors play a role of *the enrolling*, the others are obliged to be *the enrolled* in a proposed actor-network. As a result, some actors may possibly become *the un-enrolled* in the actor-network, even if they assent to be involved in the alliance proposed by the protagonist actors. That is to say, this is also a stage where unequal relations of power among actors are unfolding.

The final stage of *mobilization* is concerned with evaluation of the collective practice. In order to involve other stakeholders' continuous commitment to the alliance, the protagonist actors are required to convince the other stakeholders that the collective practice is correctly carried out. In the light of the model of *translation*, in doing so successfully, a key point is what can be recognised as the valid *representatives* of the collective practice to be evaluated. That is to say, in the light of the concept of *mobilization*, the process of evaluation is taken as the process of negotiating over *the representativity* of the collective practice.

An insightful point of the four-stage model is that it offers a framework for understanding how 'success/failure to learn' is generated in the process of legitimising a management development programme within an organisational context. That is, during the process of constructing an actor-network of a management development programme, some participants are *enrolled* as actors to play the roles for legitimising the management development programme. If it is successfully legitimised within an organisational context, those enrolled participants are turned to be 'successes to learn' in the eyes of the stakeholders. On the other hand, however, when focusing on other participants who are not enrolled in a successful chain of all the stakeholders, we can understand that a process of a successful chain of all the stakeholders being formed coincides with a process through which enrolled and un-enrolled participants are differentiated. That is to say, from this perspective, 'failures to learn' in a management development programme can be understood to denote un-enrolled, illegitimate, participants, who are excluded from a successful chain of the stakeholders in the programme.

Participants' Position of Being Enrolled

In looking back to the process of constructing the actor-network of CMP, one of the most noticeable points in terms of the participants' status was that the participants were always situated in the position of *being enrolled* by other actors, rather than *enrolling* other actors. That is to say, the participants' dilemmas can be seen as emerging from a concern as to how they should respond to the propositions by the protagonist actors (*i.e.* the facilitators and the HRD group) in terms of their identity and roles in the actor-network of CMP, and power conflicts in CMP can be recognised as emerging as one of the possible outcomes of the participants' rejection of the propositions.

In terms of how actors to be enrolled respond to propositions by enrolling actors, according to Latour (1987), the possible responses are the following three: *to accept*, *to dispute*, or *to disregard* propositions. *To accept propositions* denotes that actors to be enrolled submit, willingly or reluctantly, to playing the roles proposed by enrolling actors. While both *to*

dispute and *to disregard propositions* denote that actors to be enrolled do not submit to playing the roles proposed by the enrolling actors, it is crucial to clarify the difference between them in understanding how power conflicts emerge and end up.

On the one hand, the former response, *to dispute propositions*, means not only to reject propositions by enrolling actors, but also to interest other actors by proposing their new identities, roles, goals, motivations, and/or projects different from the existing propositions by the enrolling actors. That is to say, actors to be enrolled *dispute* their existing position of *being enrolled*, and intend to become *enrolling* actors in constructing a different actor-network in a different manner. Accordingly, refusal by *disputing* would reveal conflicts between enrolling actors and actors to be enrolled, who can be called *dissidents* from the perspective of the model of translation (Callon, 1986). As a result, when dissidents succeed in denying existing propositions by the enrolling actors, a different actor-network than before starts to be constructed.

On the other hand, the latter response, *to disregard propositions*, means not to play, consciously or unconsciously, the roles proposed by enrolling actors without fighting with enrolling actors. In other words, those actors who *disregard* the propositions by enrolling actors would become *disengaged actors* within, or *dropouts* from, the actor-network, rather than dissidents. Therefore, in contrast with the case of 'to dispute propositions', in the case of 'to disregard propositions', an actor-network in question itself can maintain the *status quo*, while some of the constituent members in the actor-network, who disregard the propositions, may change. As a result, 'to disregard propositions' would cause no controversy concerning the propositions by enrolling actors, or no revealed conflicts between the enrolling actors and the actors to be enrolled, but make the latter marginalized in, or dropouts from, the actor-network, without breaking down the actor-network itself.

In terms of 'to disregard propositions', the possible consequences of those who disregard proposals are the following two. In some cases, they may be *dropouts* from an actor-network. In other cases, providing that those who disregard proposals become marginalized in an actor-network, they can be called *un-enrolled actors*, or *partially-enrolled actors*, in the sense that they *do not*, or only *partially*, play the roles that fully-enrolled actors are expected to play in an actor-network.

In the light of Latour's (1987) perspective, in terms of the status of actors to be enrolled, the possible results are four: *fully-enrolled actors*, *dissidents*, *un-enrolled/partially-enrolled actors*, and *dropouts*. When actors to be enrolled accept propositions by enrolling actors, they become *fully-enrolled actors* in the actor-network in question. When actors to be enrolled dispute propositions by enrolling actors, they become *dissidents* in the actor-network in question and the actor-network possibly breaks down. When actors to be enrolled disregard propositions by enrolling actors, they either become *un-enrolled/partially-enrolled actors* in the actor-network in question, being given marginal positions in it, or become *dropouts* from the actor-network in question, being irrelevant entities to the actor-network. In the last two

cases of making un-enrolled/partially-enrolled actors and dropouts, an actor-network in question does not break down.

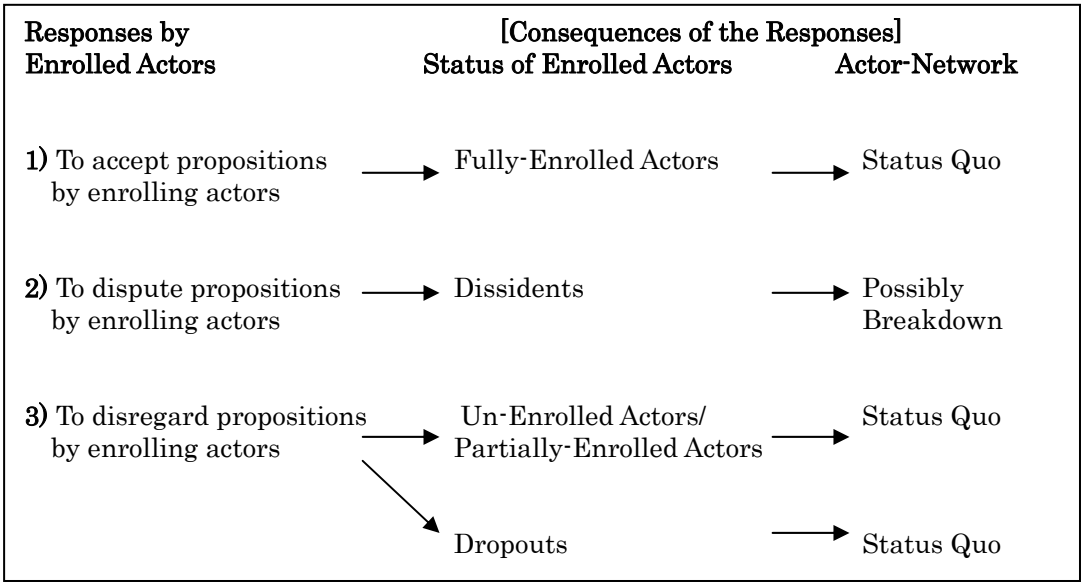

Figure 1. *Three Possible Responses by Enrolled Actors*

Rejection in Unequal Relations of Power

In relating the three possible responses of Latour (1987) to how power conflicts between the participants and the facilitators/the HRD group emerged and ended up in CMP, first of all, it should be noted that the participants gave rise to no controversy concerning the propositions by the protagonist actors that consequently would have threatened the legitimacy of the actor-network of CMP. That is to say, there were no 'to dispute propositions' which caused revealed conflicts between the participants and the facilitators/the HRD groups, although the participants often complained to the tutors, one of whom was myself, about the way of carrying out the research projects. For example, after the presentation for interim reports, on 24th April 1998, one of the participants hotly complained to the tutors about the facilitator group's strong intervention to their projects.

> "So far the facilitators have emphasised the importance of self-directed learning in CMP. But, as the final presentation is approaching, the facilitators and you suddenly started giving us minute instruction. Finally, you asked us to report about the progress of the project everyday. Everyday report, it's completely meaningless. We don't do the project for the sake of the facilitators. Nor they are our bosses. The project in CMP is for our learning, isn't it?"
>
> (Field notes on 24/4/1998)

As explained earlier, the dual criteria existed for CMP; on the one hand, CMP had to accomplish satisfactory outputs of the research projects; on the other hand, CMP had to contribute to making self-directed learners. However, the facilitators had a tendency to give priority to the former, as accomplishing satisfactory outputs could make a more direct contribution to legitimising CMP within the organisational context. Accordingly, the facilitators often regarded the participants as *members of the research project, who were administrated by the facilitators*, rather than self-directed learners. This was not happy with some of the participants, who recognised themselves as self-directed learners, as for example of the above participant. The above voice by one of the participants indicated his strong refusal of the proposition by the protagonist actors in terms of his identity, which was defined as a member of the research project, rather than a self-directed learner. In fact, he asserted that the participants in CMP should be primarily self-directed learners, rather than the project members who were administrated by the facilitators. However, his complaint was not problematised by the protagonist actors, either the facilitators or the HRD group, as one of the facilitator's following comments indicated:

> "It's not a problem at all even if they seriously rejected our instruction. Instead, if they seriously rejected our instruction, it is a very good thing. For it's a good indication to show *spirits of self-reliance beginning to grow within the participants' minds*. OK, they don't need to report every day. But you [the tutors] can check their progress as often as possible. That's enough."
>
> (Field notes on 30/4/1998)

From the facilitator's point of view, the participants' discontent was attributed to their individual mental issues, the growth of 'spirits of self-reliance', and was not recognised as any manifestation by which the propositions by the protagonist actors as the facilitators/the HRD group were to be questioned, or rejected. Here, by reducing the participants' workloads, the facilitator coped with the individual mental issue of the participants' complaint about the daily report.

As the above case typically showed, the protagonist actors, as the facilitators/the HRD group, had never taken the participants' discontent as their 'disputing the propositions', which would threaten the existing actor-network of CMP. In the context of the unequal relations of power between the participants and the facilitators/the HRD group, even if the participants were discontented with the identities, the roles, or the goals defined by the protagonist actors, they could neither succeed in changing their position from *being enrolled* to *enrolling*, nor even act on *disputing* their roles as proposed by the protagonist actors, which corresponded to 'to dispute propositions' in the light of Latour's (1987) three possible responses by actors to be enrolled. In contrast with the fishermen in Callon's (1986) study of scientific research for domesticating scallops at St Brieuc Bay, the participants could hardly become *dissidents*, who were to destroy the actor-network of CMP.

In this situation, if the participants would not like to play the roles proposed by the protagonist actors, how could they escape from the propositions? In the light of Latour's (1987) three possible responses by actors to be enrolled, the possible way should perhaps be 'to disregard the propositions', which means that the participants would disengage themselves from actively playing the roles proposed by the facilitators/the HRD group, and eventually be relegated to marginal positions in CMP. Taking into consideration this point, *'failures to learn'* in CMP can possibly be recognised as those who disregarded the proposition by the protagonist actors in the context of the unequal relations of power within the actor-network of CMP.

Simultaneously, this point indicates that a revealed conflict was only one of the consequences of the participants' refusals of being enrolled. Therefore, it is not enough to focus only on a revealed conflict, which denotes the result from 'to dispute propositions' by actors to be enrolled in the context of a rather equal relation of power existing between the enrolling and the enrolled. Instead, the focus of analysis in CMP should be also on the process of the participants' becoming un-enrolled/partially-enrolled actors or dropouts, as they are the other two consequences of the participants' refusals, if without voice, as shown in Figure 1.

From this point of view, in examining how the participants' dilemma emerged and ended up, of more significant concern is probably the issue of *the un-enrolled/partially-enrolled actors* in and/or *dropouts* from, instead of the *fully-enrolled actors* and/or *dissidents* of, the actor-network of CMP. In the following section, I will explore how some of the participants turned out to be the partially-enrolled actors in the context of constructing the actor-network of CMP, and how they experienced CMP as marginal actors in it, as for example experienced by a participant in the 10th cohort of CMP, who was categorised as 'a failure to learn' in the eyes of the stakeholders and recognised herself as such.

Learners' Dilemma and Its Consequences

Active Choice of Being Passive

When I compare 'failures to learn' in CMP with 'successes to learn' from the tutor's point of view, no particular difference in their behaviour is found in the earlier stage of the programme. In fact, the former submitted to playing the roles of self-directed learners more smoothly than some of the participants who were afterwards categorised as 'successes to learn'. However, in contrast with the earlier stage, in the middle stage of the programme, those who were afterwards categorised as 'failures to learn' often showed passive attitudes to the programme; neither asking actively for the facilitators' advice, nor actively putting the advice into practice even if the facilitators suggested some advice to them. From the tutors' point of view, they seemed to just cope with the minimum requirement of what they were told to do, while they were unconcerned with the facilitators' evaluation of their performance in the programme. In fact, Mr. Kuwata, one of the facilitators often referred to them as passive participants, and those who

were afterwards categorised as 'successes to learn' as active participants. This categorisation of passive/active participants was used as the rationale for his discriminatingly backing up only the latter, as his following comments in a meeting with the HRD group and the tutors suggested:

> "This team's problem is that none of the members is really committed to the project. We can never make passive learners' performances turn out well, even if we do our best to motivate them and to do them favours. Of course, I hope they turn out to be active learners. But, to transform passive learners into active learners is not our business. They are not schoolboys, but businesspersons with ten years' experiences. CMP is not school. So, we should concentrate our energy on supporting active learners. To lead active learners to achieve both good learning and good outputs of the project is our business."
>
> (Field notes on 20/11/1997)

In the above comments, the facilitator referred to the passivity of some participants as a cause instead of a consequence of partial-enrolment. However, in contrast with his comments, the following comments by an ex-marketing-manager of JTE, who was a participant in the 10th cohort of CMP and recognised herself as a passive participant, indicate that the passiveness was a consequence instead of a cause of becoming a partially-enrolled actor. In an interview on 4th June 2000, she explained how she regarded the facilitators' evaluation in CMP.

> "I know the facilitators saw us as bad participants, as we insisted on our own views, and did not submit ourselves to the facilitators' direction. But I didn't care how the facilitators evaluated my performance. For participating as a passive learner was my conscious decision. In the situation of those days, I've not repented of my decision at all. Although some members of our team cared about the facilitators' evaluation, I didn't care at all. As I noticed I couldn't learn what I wanted to learn, even if I had done my best, in CMP. As you know, in those days, the facilitators valued only those teams who submitted to their directions and carried out joint projects with some already existing project teams in the company. It's obvious that the evaluations in CMP were concerned with how faithful you were to the facilitators' commands, rather than how faithful you were to your own learning objectives. So I didn't care how I was evaluated in CMP."
>
> (Transcribed from a video tape on 4/6/2000)

A noticeable point in her comments is that she pointed out that being a passive learner was a result of her refusal to submit to the facilitators' direction. From the participant's point of view, the facilitators put the label of 'active learners' on those who were faithful to the facilitators' commands. When a facilitator said that he would support only 'active learners', she would understand that he would support her only if she submitted to what he told her to do. In this situation where the facilitators/the HRD group defined the participants as actors who was required to achieve satisfactory outputs of the research projects, if a participant defined her/his identity as a self-directed learner, s/he would be caught in a dilemma, as for example experienced by the ex-marketing-manager of JTE:

"The turning point for me was the presentation for the project proposal [7th November 1997]. At the presentation, I noticed the facilitators' advice lacked consistency. At the first session of CMP, Mr. Kuwata's lecture was very interesting for me. At the time, more than ten years had already passed since I started working for JTE. I was swamped with daily work and I felt I'd got into a groove in doing the business I was responsible for in those days. In fact, I was gradually losing my motivation. In that situation, Mr. Kuwata proposed to us to forget our routine business for a moment, and to challenge something new in CMP, which was lost in the daily work. It seemed so fascinating for me at the time. So I was tempted to challenge something new for marketing, accepting Mr. Kuwata and the other facilitators' encouragement. Actually, I was trying seriously to create something new in the earlier stage of CMP.

But, around the time of the presentation for the project proposal, I often heard the facilitators' comments, like 'it's not realistic'. Yes, they were becoming conscious of the outputs of our projects. It was so disappointing. Then, I could see what kind of results the facilitators wanted. They'd already got the blueprint about not only the results but also the route to the results. The facilitators often said we should search every possibility. But, let's say, we found four possible routes, for example. The facilitators always induced us to choose the one that seemed to be the most preferable for the directors. I hated such inductions by the facilitators. By 'doing away with JTE's conventionalities', the facilitators meant only thinking differently than before, and in practice, we behaved in the same way as before. We were given freedom to think about four possible routes, but no freedom to choose any route among the four."

(Transcribed from a video tape on 4/6/2000)

Although she submitted to playing the role of a self-directed learner and would not like to play the role of any other actor than a learner, she also needed to engage in the marketing research project in CMP, in which she was required to achieve the output of the project that would satisfy the directors. As the above long and rather emotional confession shows, she was caught in a dilemma. However, her dilemma did not result in a revealed conflict in the context of the unequal relation of power between the enrolling actors and the enrolled actors. She recognised the existing unequal relation of power between the participants and the facilitators/the HRD group, as she said in the following comments:

"Well, I gave up. I gave up resisting at a rather earlier stage. The facilitators lured us into devoting ourselves to CMP or the projects. But, after all, CMP turned out to be just one of the management development programmes in JTE, nothing different from the other ones. I didn't try to argue about what CMP should be. I just felt learning in CMP was not interesting for me. For me, it is interesting that something unclear is becoming clearer in the process of learning. The very moment that something unclear becomes clearer is the most important for learning. In CMP, before I reached the very moment, everything was given by the facilitators. Not only answers but also the processes to reach the answers were prepared in front of us. It was so disappointing. Yes, you can say I should have disputed about what CMP should be with the facilitators and the HRD group. But, disputing about a

management development programme was not the thing I wanted. And, most crucially, a participant's disputing could never change programmes. So, disputing about the issue seemed just a waste of my time and energy. For I wanted to learn in a self-directed way and to reach the very moment that something unclear is becoming clearer in the process of learning, rather than to discuss what management development for JTE should be."

(Transcribed from a video tape on 4/6/2000)

Given that the possible option for her was either *to accept* or *to disregard* the proposition by the protagonist actors, she eventually chose the latter. In her words, she was the person who was faithful to her own learning objective, rather than to the facilitators' commands. As a result of actively choosing the option of being faithful to her own learning objective, she became a passive learner, who disengaged herself from a learning programme that was incompatible with her own learning objective. That is to say, she actively chose to become a passive learner, rather than an active learner, who was to submit to the propositions by the protagonist actors. In this sense, "passive is not the opposite of active, but another kind of active" (Fox, 2000: 861). From the facilitator's perspective, on the one hand, she was recognised as 'passive' in the sense that she only passively submitted to his direction. On the other hand, from a partially-enrolled participant's perspective, she was active, in the sense that becoming 'passive learners' was her active choice to reject the facilitators' propositions. From her point of view, active learners in CMP would be recognised as a result of a participant's 'passive' attitude, in the sense that s/he discarded her/his own learning objective and obediently submitted to the propositions by the protagonist actors. The point is that a passive attitude to the programme was not a cause but a consequence of becoming a partially-enrolled actor in the process of constructing the actor-network of CMP.

Disengaged Learners as Outcast-Within the Programme

As the case of the JTE's ex-marketing-manager suggests, a learner's dilemma in the context of an unequal relation of power would result in generating a passive learner in an institutionalised learning setting. However, it might probably be worth noting that the case of the ex-marketing-manager suggests another dimension that an institutional arrangement of management learning involves. Even if some participants in CMP became passive learners as a result of their disregarding the propositions by the facilitators, they were, if anything, partially-enrolled actors *within*, rather than dropouts *from*, CMP. In other words, although the disengaged learners were those who did not fully play the roles proposed by the facilitators, they hardly gave up CMP in a literal sense. In fact, among 252 of the total participants in the 12 year history of CMP, only one participant actually gave up CMP and was struck off the list of CMP in the middle of the programme.

This was mostly because a participant's dropping out from the programme without her/his supervisor's official reference to the company was taken as not fulfilling an office regulation,

and therefore had a strongly negative effect on the participant's future career in the company. In the interview with the ex-marketing-manager of JTE, 4th June 2000, she explained what a participant's dropout from CMP meant for the employees of JTE.

> "To drop out from a HRD programme is too unrealistic for the employees of JTE, even if it is the sort of programme they hate to participate in and find no value in. Or, I would say it is practically impossible unless you don't care about your future in the company. In fact, I've never heard a case of a dropout of a participant's own accord, although there are some cases that the company permits some participants to withdraw from HRD programmes halfway through by reason of emergency and significant business. So, almost all of the participants keep participating in HRD programmes, and finish them, even if they don't like to do so, like me in the case of CMP."
>
> (Transcribed from a video tape on 4/6/2000)

Accordingly, almost all of the passive participants did not formally drop out from the programme, and experienced the later stage of CMP as marginal actors. That is, while they did not actively play the roles defined by the protagonist actors, they kept attending the programme as disengaged learners.

Meanwhile, this marginal position of the partially-enrolled actors was in part maintained by the protagonist actors' subtle attitudes to them. After the fully-enrolled actors and the partially-enrolled actors were differentiated, neither the facilitators nor the HRD group ever showed an attitude of forcing the latter to actively play the roles defined by the protagonist actors. That is, with regard to the aim at accomplishing satisfactory outputs of the project, the partially-enrolled actors were *outcasts-within* the programme, in the sense that the facilitators did not expect them to accomplish 'good' outputs, but only to complete the project. As mentioned earlier, it was the tutors' task to realise a 'soft landing' for the partially-enrolled participants' projects. However, to realise the disengaged learners' 'soft landing at the final destination' was taken as a necessary condition for legitimising CMP in the organisational setting, as indicated in the following comments by an ex-HRD-manager of JTE:

> "Off course, I wanted all the participants to achieve as good outputs as we expected. But, even if some of the participants were to show unsatisfactory performance in a management development programme, we wouldn't be allowed to kick them out of the programme. We shouldn't take care of only good learners in management development programmes. If you find many dropouts from a management development programme, do you think the programme is good? No one thinks so. Every HRD person would know, first of all, that we should avoid causing dropouts from their programmes. As participants aren't schoolboys, it is natural that some of them are unhappy with the programme they are attending. In this case, we should lead them to achieve a 'soft landing at the final destination' without 'making an emergency landing' during the programme. If we were to be allowed to kick out 'bad' participants and to concentrate on supporting 'good' participants, what an easy task HRD would be! In fact, we don't need pay too much attention to excellent learners, as they can achieve a good performance without our support, if they are really excellent. I

> would say the HRD person's real mission is about how to deal with learners who are not excellent."
>
> (Transcribed from a video tape on 15/7/1999)

Given that it was hardly possible for all the participants to obediently submit to the propositions by the facilitators, in order to legitimise CMP, it was centrally important to make even the disengaged learners stay in the position of the *outcasts-within* until the end of the programme, without transforming them into *dropouts-from* the programme. As a tutor, who took charge of supervising the disengaged participants, I eventually generated *'outcasts-within'* instead of *'dropouts-from'* CMP, by suggesting minute instructions, for instance, sometimes writing the presentation scenarios on behalf of some of the project teams. Then, when the disengaged participants kept staying in the position of the *outcasts-within* until the end of the programme, they were eventually labelled 'failures to learn', even if becoming a disengaged learner is her/his conscious decision under the unequal relation of power between the participants and the facilitators/the HRD group. That is to say, legitimisation of CMP and generation of 'failure to learn' were two sides of the same coin, which is like that described by Star (1991): "every enrolment entails both a failure to enrol and a destruction of the world of the non-enrolled" (*ibid*.: 45).

The focus on the *outcast-within* CMP is in agreement with the above perspective described by Star (1991), in the sense that both are conscious of the danger in focusing exclusively on the protagonist actors and the fully-enrolled actors, and therefore pay more attention to how un-enrolled/partially-enrolled actors, or those who disengaged from a collective practice that other actors are actively participating in, are generated. Star (1991) points out the danger of illuminating a successfully constructed actor-network exclusively from the perspective of big and powerful actors, and intends to give marginal, or un-enrolled, actors, voice, as she asserts:

> "A stabilized network is only stable for some, and that is for those who are members of the community of practice who form/use/maintain it. And part of the public stability of a standardized network often involves the private suffering of those who are not standard – who must use the standard network, but who are also non-members of the community of practice." (Star, 1991: 43)

While the case of CMP is in line with Star's (1991) argument in that it suggests the stakeholders' practice to legitimise CMP brought out a destruction of the world of the ex-HRD-manager in CMP, it can be taken as unique in that the legitimisation of CMP was in part achieved by keeping the marginal participants *within* CMP, without making them beak away *from* the CMP. If CMP had generated many dropouts, it surely would not have been legitimised within the organisational context. That is to say, even disengaged participants should not be turned into dropouts from the programme, but should manage to finish the programme even if their outputs were unsatisfactory. To put it another way, the *outcast-within* CMP were not by-products but essential entities for legitimising the actor-network of CMP.

As Star (1991) and Michael (1996) point out, ANT has a tendency to focus on how powerful actors successfully transform other actors into those who accept the propositions, or how 'dissidents' appear in an actor-network in question. Thus, they often pay little attention to un-enrolled/partially-enrolled actors, who disregard propositions by enrolling actors. In Latour's (1987) argument, although he suggests the three possible responses to propositions by enrolling actors, the emphasis is given to how enrolling actors avoid generating dissidents, who dispute propositions by enrolling actors, rather than those who disregard them. In Callon's (1986) study of scientific research for domesticating scallops at St Brieuc Bay, he does not illustrate how un-enrolled/partially-enrolled actors and/or dropouts are generated in the actor-network of domesticating scallops, nor how their existence is related to constructing an actor-network. Different from these classic cases, the case of CMP suggests that constructing the actor-network of CMP entailed transforming partially-enrolled, or marginal, actors into the *outcast-within*, instead of *dropouts-from*, the actor-network of CMP.

Concluding Remarks: Perspective on 'Failure to Learn'

In this paper, how the participants' dilemma unfolded and ended up in the context of constructing the actor-network of CMP is explored, by focusing on the unequal relations of power between the enrolling actors and the enrolled actors. In particular, how some of the participants became partially-enrolled actors and how they experienced CMP as marginal actors were examined in relation to the participants' dilemma and its consequences. In concluding the present paper, I will examine the lessons that can be drawn from the ethnographic inquiry in the above points, especially in terms of the issue of 'failure to learn' in institutionalised management learning.

An insightful implication that the case of CMP offers is that the case draws our attention to disengaged learners as *outcasts-within* institutionalised learning events/programmes. As the case shows, disengaged learners can be taken as essential actors for legitimising the actor-network of a management development programme. In terms of the roles of marginal entities in constructing an actor-network, Michael (1996) argues that powerful 'heroic' actors and fully-enrolled actors on their own cannot achieve stability of an actor-network, but seemingly 'trivial' actors who have dimensions of both insiders and outsiders make it possible to stabilise an actor-network. This holds true for the case of CMP. That is to say, the *outcasts-within* CMP, who have both 'insider' and 'outsider' dimensions, played significant roles in the stabilisation of the actor-network. As the participants were annually replaced in each cohort of CMP, it was very difficult to constantly keep a high ratio of the participants' project teams that accomplished satisfactory outputs of the projects. This depended upon the participants' motivation, the time they were required to be engaged in the business in the departments/branches, opportunities of the joint projects with existing project teams in the company, and so on. Therefore, in order to stabilise the legitimate position of the management development programme within the organisational context, it was crucial to successfully

transform disengaged learners into the *outcast-within*, rather than *dropout-from*, the programme.

Taking this into consideration, we, as students of management learning, should perhaps recall that we have hardly seen institutionalised management learning events/programmes, either university-based management courses or corporate management development programmes, from which many participants dropout in the middle of events/programmes. At the same time, we all know that not a few participants do not seriously commit themselves to such events/programmes, and often finish them without achieving the expected results. That is to say, from the perspectives of ANT, there are many partially-enrolled actors, who do not actively submit to playing the roles of participants proposed by the enrolling actors in actor-networks of institutionalised management learning events/programmes. Nonetheless, not a few of such actor-networks can maintain stability, in the sense that not a few university-based courses and/or corporate programmes continue for years despite involving many partially-enrolled actors. How can the stability of actor-networks be realised while including disengaged actors in them, in the case of institutionalised management learning? In order to explore this issue, we should focus not only on fully-enrolled actors but also on partially-enrolled actors like the ex-marketing-manager of JTE. By doing so, it is possible to deepen our understanding of how institutionalised management learning generates not only 'success to learn' but also 'failure to learn' in socially situated ways.

Note

1) All the names of individuals, organisations, and the management development programme mentioned in this paper are pseudonyms used to preserve anonymity and confidentiality. This guarantee was a precondition for the company's permission to do the present research.

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Practicing organizational objects: learning and knowing as 'flirting' with material heterogeneity

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Abstract

In the actual debate on organizations, learning and knowing are seen as practical activities and accomplishments: something that people 'do together' and which results as an effect of the collective coordination and arrangement of different 'materials'.

In this debate, objects and technologies occupy a growing and relevant position: they are learned as elements of membership in the reference group of organizational actors and inasmuch as they are connected with conventional work practices, they almost invisibly support the performance of tasks. In other words, technologies are seen as activities embedded in the organizational context in relation to other instruments and practices and, thus, contributing to organizational performativity. Their presence stresses that social and organizational relations operate by virtue of a set of actants whose task is to enable, reinforce and testify to the existence of those relations.

On the basis of a four-month ethnography conducted in a hospital which has introduced an electronic patient record, in this paper I shall describe and discuss knowing and learning in organizational activities as 'flirting' with material heterogeneity. Interpreting objects and technologies in terms of 'affordances' (Gibson, 1979), I will show the multitude of material forms in which knowing and learning take place. At the same time, adopting the notion of *relational materialism* (Law, 1994), I will point out how learning and knowing are themselves performances of ordering strategies, highlighting how objects and technologies participate to these strategies.

The suggestion is to look at learning and knowing as 'flirting' with the material heterogeneity of the world, performing objects and practices as the alternate product of the relations between subjects and their environments.

Introduction

In the actual debate on learning and knowing in organizations, practice seems to be the new blockbuster concept. A 'practice turn' (Schatzky et al., 2001) has occurred, a 'practice-based approach' has already been framed (Gherardi, 2000) and science and scientific inquiry itself appear as a set of complex and heterogeneous practices (Pickering, 1992; Law and Mol, 2002). Attention has shift from the cognitive, cultural and symbolic aspects of organizing (Weick, 1969) to its performative and material forms (Law, 1994; Knorr Cetina and Preda, 2004), thank also to the wide-spreading effect of the 'so-called' (Latour, 1999) actor-network theory on organization studies (Czarniawska and Hernes, 2005). Learning and knowing are seen as practical activities and accomplishments: something that people 'do together' (much more than 'think alone') and which results as an effect of the collective coordination and arrangement of different 'materials' (much more than 'ideas' or 'information').

In this debate, objects and technologies occupy a growing and relevant position: they are learned as elements of membership in the reference group of organizational actors (Nicolini, Gherardi and Yanow, 2003), and inasmuch as they are connected with conventional work practices, they almost invisibly support the performance of tasks (Star, 1999). In other words, technologies are seen as activities embedded in the organizational context in relation to other instruments and practices (Suchman et al., 1999) and, thus, contributing to organizational performativity. Objects and technologies cease to lie in the background and become fully part of the interactions and practical infrastructure which 'materialize' the activity of organizing; their presence stresses that social and organizational relations operate by virtue of a set of actants whose task is to enable, reinforce and testify to the existence of those relations (Latour, 1992; Knorr-Cetina and Bruegger, 2002).

On the basis of a four-month ethnography conducted in a hospital which has introduced an electronic patient record, in this paper I shall describe and discuss knowing and learning in organizational activities as 'flirting' with material heterogeneity. Interpreting objects and technologies in terms of 'affordances' (Gibson, 1979), I will show the multitude of material forms in which knowing and learning take place. At the same time, adopting the notion of *relational materialism* (Law, 1994), I will point out how learning and knowing are themselves performances of ordering strategies, highlighting how objects and technologies participate to these strategies.

Affordances, relational materialism and learning as 'flirting'

In recent years the social sciences have grown increasingly interested in the role performed by objects and non-human actors in everyday life (Pels, Hetherington and Vandenberghe, 2002) and there are already those who call for a post-social world and an object-centered sociality (Knorr-Cetina, 1997). Especially in the field of organization studies, more and more researchers go beyond the analysis of human contexts and interactions to examine places characterized by complex and technologically dense practices and 'objects and/in organization' begins to constitute a theme and a method of inquiry (see for example the Special Issue of Organization on "Objects and Organization", 2005/2). This kind of interest was already present in studies on 'cooperative supported communicative work' (CSCW) but, as some authors remark, from a certain point of view these studies have dissolved technologies into more complex social dynamics. In CSCW, attention has shifted to the human negotiations that take place on occasions of design or breakdown, with the study of the performative and reflexive dimension of technological objects being forgotten (Woolgar, 1988; Berg, 1998). What is lacking, that is to say, is study of what ethnomethodology calls the 'quiddity' of the object and its contribution to the creation of a meaningful world, with the consequent danger of a sort of sociological reductionism which eliminates the distinctive features of the object under examination (Woolgar, 1991).

In this regard, Gibson (1979) proposes that objects should be read in terms of *affordances* – as if, that is to say, the materiality of objects 'invites' a particular kind of use to be made of them. The same object may be used in different ways, and each of these ways is *an affordance*. Thus, a knife affords cutting, threatening, opening a window-catch, and lots more. As noted by Harré (2002), the fact that objects have diverse *affordances* therefore means that they acquire different identities according to the narrative that constructs them socially, but always on the basis of certain material factors. It also means, however, that objects are constructed in the relations that they establish with humans, and that their performance of a more or less active role in social life is not due to their properties but to the type of relation.

Affordances, in fact, share at least three properties (Grasseni and Ronzon, 2004):

- *affordances* are properties of the environment. They do not depend on the aims and the needs of the subject and are in some ways independent from his/her ability to perceive them;
- *affordances* exist in relation of the subject's capacity of action. Affordances are linked to the physical body (what the subject *can* do), but also to the potentiality of this body (what the subject *could* do);
- *affordances* depends on the subjects' ability to 'pick up' the characteristics the specify *affordances*. There may be situations in which there is an affordance, but there are no information to specify it (as if in a room there is a door made invisible); or where there is an *affordance* even if there are not specific environmental information to specify it (a door 'invites' to its trespassing anyway, if the subject has the appropriate dimension).

The concept of *affordance*, thus, puts the distinction subject/object in question. *Affordances* are 'real' *per se*, in that their existence does not depend on perception or interpretation; at the same time, *affordances* materialize referring to a subject able to catch them. In this way, the notion of *affordance* introduces the idea of a mutual relationship between subjects and environments as components of a unique dynamic system. Gibson (1979) refer to the case of a flat, horizontal, wide and stiff surface: the *affordance* of 'support' that it offers to an animal (a dog), may disappear in relation to another animal (an elephant, for example), because of the weight differences. This remark makes explicit that *affordances* are not tied to actor's knowledge, but to his/her potentiality of action (Ingold, 1993).

From the affordance of the object to the relational materialism of the social

Studying the design of everyday objects (lights, cars, tv, and so on), some authors have highlight some other characteristics. *Affordances* can be nested or grouped, when the possibility of action is articulated in more, hierarchically ordered, sub-actions (Gaver, 1991), as in the case of the *affordance* of 'pulling' a door-handle, which is nested in that of 'opening' of the door. This 'sequential' property of *affordances* attracts attention on the idea that some of them will be present only at a certain stage of action and that 'exploration' is a key dimension of the being-in-the-world. Moreover, *affordance* is not binary concept as it

tends to appear in Gibson's work. Albrechtesen et al. (2001) note that a ladder cannot just have (or have not) the *affordance* of 'climbing', it can also present the *affordance* of climbing, but with some difficulties. This means that, given the variety of contexts and situations of everyday life, it is more useful to think about the concept of *affordances* as a continuum, more than a dichotomy.

Given this two further characteristics, the notion of *affordance* reassemble that of *relational materialism* proposed by John Law (1994) in reference to the 'materials' involved in organizational inter/action. The notion of *relational materialism* tells us that reality exists in a multitude of material forms, and that these are not simply given in nature but are the more or less precarious effects of ordering strategies; 'organization' is an effect of the heterogeneous engineering (Law, 1987) of persons, texts and objects. In fact, human actions and words do not have the same 'durability' (in time and space), and the possibility of maintaining a form of order depends on the creation of a structure comprising mobile and durable elements (Latour, 1987). The materiality of the intermediaries[2] to which we entrust our actions therefore form an essential part of the social order and give rise to a symmetrical vision: all 'materials' help to give meaning to the social order, despite the fact that they themselves are the product of an ordering process. Materiality and sociality are thus the joint effect of diverse organizational strategies. Humans and non-humans are the alternate products of social and technical relations, and stability resides in the possibility of performing the heterogeneity of the social (Law and Mol, 1995).

The implications of the notions of *affordance* and *relational materialism* for learning and knowing are multiple. They stress even further the link between learning, knowing and doing and, thus, the inextricable connection between action and environment, subject and object, theory and practice. From the ecological standpoint of Gibson, in fact, subjects make sense of the social 'flirting' with it, more than interpreting it. This means not only that knowing is a practical and situated activity, but also that perception itself is an activity (more than a requirement for action), because it is the effect of our being-in-the-world (Grasseni and Ronzon, 2004).

But this means that, depending on the activities a subject is involved, s/he will also be more (or less) attuned in looking for particular kinds of perceptions and information. The 'meaning' of an object is not the result of a (cognitive) act of interpretation, but it is rooted in the pattern of practical activities in which the object is embedded. Thus, not only knowledge is practical, but it refers to what an environment can offer for the development of the activity in which the subject is reflexively implicated.

The final suggestion, then, could be to look at learning and knowing as 'flirting' with the material heterogeneity of the world, performing objects and practices as the alternate product of the relations between subjects and their environments. This suggestion will be persecuted through some empirical observations.

The research setting

The observations presented in what follows are part of broader research (Gherardi and Strati, 2004) conducted by the *Research Unit on Cognition, Organizational Learning and Aesthetics* for a project on 'oncological teleconsultation' and the creation of a 'distributed multidisciplinary virtual clinic' in the province of Trentino, Italy.

A year of participatory design between doctors and information engineers led to the construction of an 'electronic patient record' (EPR) and an inter-hospital network which permits the 'sharing' of patients among the doctors in the hospital department. Moreover, the EPR was conceived not only as an information sharing and management tool with regard to patients, but also as a supplement to certain organizational processes (e.g. keeping the appointments diary). This means that, albeit to different extents and for different reasons, doctors and nurses make daily use of the EPR system, the prototype of which, after being tested, was implemented in June 2001.

Although I negotiated I mainly engaged in the structured observation (Mintzberg, 1971) of certain organizational occasions (team meetings and discussions of clinical cases), and of certain personnel (doctors and nurses), after about a month of observations I noticed that the EPR was located in some spaces and times, but not in others; and that some actors showed especial confidence in using the system while others seemed unaware of its existence. I also realized that there was a set of processes of which I was ignorant, and which I was unable to comprehend because I had been concentrating on human reactions. In not entirely conscious and almost haphazard manner, I therefore decided to embark on a different type of observation, concentrating on 'shadowing' (Bruni, 2003, 2004; Bruni, Gherardi and Poggio, 2005) the EPR.

I have focused elsewhere on the methodological implications (for organizational ethnography) and theoretical suggestions (for organizational analysis) that 'shadowing non-humans' can stimulate (Bruni, 2005). Here I want to concentrate more on the implications for learning and knowing in organizational activities.

As we shall shortly see, in fact, involving relevant actors was not enough for the technological object to participate without difficulty in the everyday organizational life of the Unit. The process was not sufficient to render the EPR an object 'expert' in inhabiting the various organizational spaces and participating in quotidian work, so that it stood out as a 'latecomer' within a more composite 'community of objects'.

In the next pages, we shall follow the new technological object within three places/activities that condense the organizational routine of the Unit: the Day Hospital (where out-patients are examined and given therapy); the Ward (with hospitalized patients); and the Surgery (where first and follow-up examinations are made). The description and interpretation of the ethnographic data will proceed in parallel. The linking theme will be the bond among objects in use, actors and everyday organizational practices.

The Day Hospital: learning and knowing in a community of objects[3]

The main reference point (in organizational terms) for the day hospital's activities is the patient reception area. This is where the nurses 'receive' the patients coming into the department for chemotherapy. This is where doctors and patients ring if they need to speak to the day hospital's nursing staff, and this is where the computer used by the nurses for the Electronic Patient Record (EPR) is located, as well as all the paper-based clinical records for patients currently receiving treatment. At present, in fact, for a patient record to have legal validity it cannot exist solely in electronic form but must also have 'materiality' (i.e. exist on paper and bear the signatures of the doctor and the chief consultant). Each EPR is therefore printed out and placed in a folder containing all documentation on the patient. Moreover, although since June 2001 all folders have existed in electronic form as well, EPRs produced prior to that date have not been digitized and countinue to exist in paper form alone. In short, all patient records continue to exist in paper form, some as originals, others as print-outs of their corresponding EPRs.

Arranging patients and objects

Patient reception is organized in a structured manner, although there are a number of possible 'variations on the theme':

1. The patients present themselves at the counter. They give their names, although they may be immediately recognized by the nurse. Or they may say nothing as they hand the nurse an envelope containing their test results.
2. The nurse checks the patient's appointment. She may do so on the computer or by consulting the daily print-out (always present) of the computerized appointments.
3. The nurse retrieves the patient's clinical record from a wheeled tray (trolley). All patients are 'accompanied' by their clinical records when they see a doctor (who consults it and updates it). Because appointments are programmed, the nurses place the clinical records of the patients expected for that day in a trolley. Although the records are usually in the right place, it may happen that they are somewhere in the reception booth but not in the trolley. Or they may be in the trolley but filed under the wrong letter.
4. The nurse checks that the haemachrome test results have been placed in the patient's folder. Because of the side-effects of chemotherapy, certain blood values (typically haemoglobin and the production of white globules) are constantly monitored. These values are essential medical benchmarks, for without them the doctors are unable to decide whether and how the pharmacological therapy should proceed. It is therefore absolutely necessary for them to be present in the patient's folder. Some patients bring their test results with them; others have been tested that morning and the results reach the nurses via fax, or via an intranet linking the hospital's various departments to its laboratory. If the clinical record is paper-based, the nurse only has to highlight the

values (using a marker pen) for the doctor to look at, and then places the test result sheets in the patient's folder. If the clinical record is instead in digital form, the blood values are fed into the computer (which automatically highlights those outside the parameters).

5. The nurse writes a number on a sheet of paper (a 'day-hospital form') which she inserts in the folder, and gives the same number to the patient. The numbers are progressive and are automatically assigned by the software on the basis of the patient's place on the day's appointments list. The number in the folder is used by the doctors to call the patients. The number given to the patient is printed on a green-coloured slip of paper if the test results are normal (so that the patient receives his/her usual therapy) or on a yellow slip if the blood values are out-of-parameter (in which case the doctor decides what to do). It may happen that there is no slip bearing the patient's number, in which case the nurse writes it on any piece of paper that comes to hand.
6. The nurse tells the patient to take a seat in the waiting room. The patient may leave the counter in silence, or s/he may talk briefly with the nurse, or protest about the colour of his/her slip, or complain because his/her test results have not yet arrived.

Observation of a routine activity like that of patient-reception in a day hospital immediately brings a large number of objects to notice: clinical records, diaries, sheets of paper, test results, slips of paper of various colours, 'post-it' notes, as well as the computer and the EPR. All these objects are vital for patient-reception, and they comprise ordered relations which materialize in the patient/nurse interaction.

The most important object, the one that takes precedence over all others, is the file containing the patient's clinical records (whether paper or electronic). This sets out the patient's clinical history and, if it is missing, invalidates the interaction. Second in importance are the day's test results. These signal the patient's situation 'at present'. If they are lacking, they invalidate the presence of the clinical records folder, because it lacks the most recent clinical results. There are then the 'day hospital forms'. These testify to the fact that the patient has been 'received', that s/he must be examined, and that via a medical service s/he will encounter further therapeutic and pharmacological objects. Last but not least come the coloured numerical slips. The purpose of these is to give a 'position' to the patient and to furnish (by means of their colour) a rough indication of his/her present condition. These slips are the only objects not indispensable to the performance of the reception activity, because their absence can be easily remedied by using more anonymous pieces of paper. At the same time, however, they are the most concrete source of conflict in the nurse/patient and doctor/nurse interaction, and they must therefore be managed with care.

All these objects are intimately interconnected. In as much as their arrangement does not come about 'automatically' but requires human intervention (principally by the nurses), they enjoy varying degrees of freedom and develop relations which involve other objects and 'guide' human interaction. It is advisable, therefore, to consider how cohesion and complexity

come into being amid the routine of an ordinary working day in order to understand how the EPR participates in organizational dynamics.

The Electronic Patient Record as a 'newcomer'

As shown by the patient reception activity, the 'community of objects' within the Day Hospital is an extremely cohesive and complex community. That the EPR is an object by now part of the department is already apparent when the Day Hospital opens in the morning.

> The day begins for the D.H. at 7:30, when the head nurse opens the door, switches on the lights, turns on the computer, and so *les it be known that someone's there*. The nurse then goes to the injectorate delivery system and prepares the drip feeds for those patients who do not have to be examined by a doctor because their therapy programmes have already been decided. At 8:00 the waiting patients are summoned and seated in the infusion zone to undergo their therapy. The nurse prepares ice, attaches the drips and distributes the ice among the patients.
>
> At 8:30 another nurse arrives, and the D.H.'s activity proper begins: checks are made that all the clinical records for the patients expected during the day have been 'prepared'[4] (the nurses use a computer print-out of the appointments list, on which they note any anomalies) and the first patients are summoned in the order established by the computer. Stacked on the table in the reception booth are clinical records to be archived. These are marked 'ARCH' in red, and they often also have post-it notes attached stating 'CLOSE D.H.'. Some of them may also be marked with a cross (in blue), which signifies that the file is to be archived because the patient has died.
>
> The telephone rings constantly, and the first test results begin to arrive via fax.
>
> The chief nurse collects the EPR print-outs for new patients so that she can 'open' the corresponding clinical files. She uses a rubber stamp to number the folders containing the new EPRs and copies the numbers into a notebook.

This brief account of the beginning of a (hypothetical) day shows that the EPR is by now a commonplace object among those used in the D.H. It is 'let known' that the D.H. is open not only by activating its usual objects (lights, doors, drip feeds) but also by turning on the computer. The print-out of the day's appointments is one of the first objects consulted in order to verify the presence of other objects, and it is the software that manages the timetable of patient examinations. Likewise, the head nurse who stamps numbers on the files containing the EPR print-outs, and then records them in a notebook, testifies to the EPR's membership of the organization's 'community of objects', as well as demonstrating how the EPR relates to the objects-in-use.

Further demonstrating the EPR's growing importance in everyday organizational life is the manner in which it, together with other objects, sets times and actions. The 'community of objects' with which the nurses interact, in fact, is also characterized by the temporal relations that the objects establish among themselves, and by the times that distinguish their practices of use. This is evinced by the manner in which relations among the objects materialize organizational times (the 'switching on' of the day hospital, the administration of the

therapies), but also by such everyday micro-events as drinking a cup of coffee while a particularly long chemo-infusion is being administered. Or taking a break from the reception work when the clinical records folders on the trolleys outside the surgeries have been counted: these folders correspond to the patients in the waiting room, so by counting them the nurses know how many patients have been treated and how many are still waiting.

Objects thus mark out trajectories for human action, and the organizational activity of the D.H. is made possible not only by the existence of a community of human actors (the nurses) but also by continuous relations/interactions among non-humans. This signifies that the ERP has become an object 'internal' to organizational practices, not only because it is socialized to the use made of it by the actors but also by virtue of its encounter with the 'community of objects' present in the D.H.

However, the everyday organizational life of the Oncology Unit extends beyond the D.H.: it acquires further objects, practices and relations in other organizational settings. The following section discusses the elements (practices, knowledges, actors, objects) with which the EPR comes into contact in another space: the Ward.

The Ward: the Electronic Patient Record meets medical practice

In the Ward, the ERP is localized in the doctors' room, where most use is made of it. This is because the nurses spend most of their time with the patients (many of whom require constant attention), but also because the gradual development of the EPR has not yet included the nursing staff. A computer for use by the nurses has only recently been installed in the ward, so that some of them are still unable to use either it or (even less) the EPR. Moreover, the charge nurse does not believe that the EPR is suited to nursing practices in the department.

> There are so many call bells, and if you've got all your patients on drips you've got to respond, which is another load on the nurses' shoulders! *[explains the Charge Nurse]*. Down at the Day Hospital there's a *[nurse]* assigned to data entry but here in the ward you've got so many things to do that if you stop… too many things to do and too many readings to monitor to go and log everything on the computer… for example, the glycaemia medication, first you use the test strip, if the strip's okay you give the medication, but you don't necessarily write it down… obviously if you give the medication, that means that the strip's okay!

For the Charge Nurse, therefore, the encounter between the EPR and the objects in the ward is made problematic by the diverse relations among these and with the actors. The interaction with the patients is reflected by the objects in use (the call bells, the drip feeds), which in their turn form relations which yield indications for future action. The meanings of some of these relations (for instance, between a blood sugar strip and medication) are so commonplace that they can be taken for granted (by the actors and by the objects automatically associated with them) but need to be illustrated, explained and rationalized to a 'newcomer' like the EPR. This reverses the knowledge relation among nurses, objects and patients. Whilst the relations among the objects in the ward yield knowledge for the nurses on

the patients' conditions but do not require (indeed, prevent) knowledge about the behaviour of individual objects to be spelled out, in their interaction with the EPR the nurses must make the interaction of/with other objects explicit. This induces the Charge Nurse to regard the new object as an interference in the ward's everyday life, something which obstructs the work of its actors and hampers the relationship with/of objects. Therefore, whilst for the nurses the various objects yield information on the state of the patients, the EPR as the 'newcomer' is an object that 'does not know' and which must be introduced to the relations with/of the other objects and to the ward's organizational practices. The EPR's learning path in the ward, however, takes place in the doctors' room, where practices different from those activated by the D.H. objects take shape.

Spaces and objects of sharing

The doctors' room is the space that weaves the medical/organizational activities of the ward together. Three times a week a meeting is held (together with the chief consultant) to discuss the clinical cases; held once a week is the team meeting (with the chief consultant); and every day doctors and nurses meet to exchange information and update each other on the conditions of the patients.

Like D.H. reception booth, the doctors' room contains numerous objects. Some are the same as those in the D.H.: clinical records, test results, administrative forms, therapeutic programmes and drugs charts. But whereas organizational practices in the D.H. materialize around the inter-object relations necessary to align clinical records and patients, practices within the doctors' room concern mainly the consultation and updating of clinical records. This is also due to the type of organization that the chief consultant has given to the department: patients are 'shared' (in the sense that patients may treated by different doctors during their stay in hospital), so that it is essential for the doctors to have instruments that make this 'sharing' possible.

The first object serving this purpose is a whiteboard in the doctors' room listing the names of the patients presently in the ward. This whiteboard is an *aide-mémoire* on the beds occupied in the ward: on the death or discharge of a patient, one of the first organizational actions is to cancel his name from the whiteboard. When an urgent admission request is received, it only takes a rapid glance at the board to see whether a bed is available. In the case of a patient still awaiting treatment, a doctor may ask: "Whose patient is X?" (meaning which doctor should deal with him) and a colleague replies "Everybody's and nobody's … he's there" (pointing at the board).

The whiteboard is consulted by the doctors mainly during joint discussion of clinical cases and whenever it is necessary to 'take stock' of the conditions of the patients and review the current situation. 'Taking stock' is an everyday activity during which the whiteboard also forms a relation with another object used for patient-sharing: the ward diary, into which the patients' names are copied on a daily basis (from the whiteboard) and alongside them the

medical actions to be performed during the day. Given that this is the only diary that exists, once 'stock-taking' has been done, photocopies are made of the day page and distributed to the doctors as an agenda for the rest of the day's work.

The relations among these various objects materialize a practice whereby the actors are able to meet briefly to share the most urgent information, update each other on upcoming events, and appropriately deploy the ward's objects. 'Stock-taking' requires the actors to pay attention to objects (and relations) that may concern the treatment of a patient (tests, therapies, but also communications to relatives and/or the GP, and which therefore involve entirely different objects and relations), the EPR included. It may happen, in fact, that during 'stock taking' the doctors not only update themselves on the patients but also examine their EPRs (whether all the test results are present, whether some variation in the therapy should be entered) and determine whether a patient's notes require action to be taken on his EPR. As the 'latest arrival', the software is unable to handle urgencies and contingent events (situations in which several objects combine in destructured manner) and must be inserted into structured relations.

The activities that by definition structure the EPRs relation with the ward's objects are the recording of the patients' daily test results and, on the basis of these, the pharmacological therapies decided. These are now discussed.

For an object that 'enters' is there a relation that 'exits'?

The patients in the ward have daily blood tests, the results of which are used to decide whether or not they can be given therapy.

Before the introduction of the EPR, the doctors used to receive the test results by fax. All they had to do was inspect them (highlighting abnormal values or instead writing 'TESTS OK') and place a copy in the clinical file. Today there are three computers in the doctors' room. Two of them are configured for the EPR and are used only by the doctors; the third is instead used (by both doctors and nurses) to upload test results from the laboratories. Because the two programs are not integrated, every day the doctors must print out the test results and copy them into the EPR, which automatically highlights any abnormal values.

From a certain point of view, one can say that the EPR has done nothing more than give concrete form to a medical practice (examining the test results) by activating a new practice (copying the test results). However, this has also given rise to a different organization of work within the ward, because, every day, once all the test results have been received, one of the doctors (in turn) must copy the test results into the various EPRs. The operation takes time (eight values for each test must be copied, although only two of them are of interest to the doctors for purposes of therapy), and it also requires caution (there is a risk that mistakes will be made in copying values). It switches the actors' attention from the content of the test result print-out to its correct entry in the EPR. Thus the demise of a relation between objects (the paper-based clinical record and the test results) not only transforms the practice of examining

the results into copying them; it also translates the knowledge contained therein from the level of active observation (examining) to that of unthinking repetition (copying). Whereas before introduction of the EPR the actors intervened in the material relation between two objects (placing a test result sheet in a paper clinical folder), using it to exercise and communicate a form of medical knowledge (whether or not the test results were 'OK'), they are now required to set two objects in relation (the two computer programs) so that medical knowledge can be made explicit by one of them (the EPR).

The relation between the test results and the EPR is so frequent and structured that it is by now an intrinsic part of the organization's everyday routine (as also demonstrated by the fact that the doctors have). Yet there are other objects with which the EPR forms relations in the ward, and with which its interaction less planned.

The Electronic Patient Record and the discussion of clinical cases

From a medical-organizational point of view, the activity of greatest significance for the life of the ward is discussion of clinical cases. This almost always takes place in the presence of the chief consultant and one or two nurses. The discussion is quite structured in terms of interaction: the doctors describe the case, the chief consultant takes notes on a piece of paper (the notes could not but be on paper because, as the doctors and nurses pointed out, there are no computers at the patients' bedsides), and there is no apparent differences between the paper-based clinical record and the EPR: both summarize the patient's condition.

However, there may be discrepancies between an EPR and its paper print-out. It is by no means certain, in fact, that the EPR will contain the same information as the folder with its paper copy, and the fact that one of the two does not take account of an object does not imply that the other does likewise. It is as if objects aggregate together in different ways according to the form taken by the EPR (digital/paper-based), on the basis of some sort of 'material affinity'. The doctor's expertise in this case consists in being able to recognize this affinity, as shown by the following fragment.

> The patient being discussed, after a period in which his condition has deteriorated, has shown distinct signs of improvement in the past week. Moreover, the most recent CAT scan has not revealed cerebral metastasis. The chief consultant asks to see the patient's various CATs. On inspecting them, he asks why one of the scans is much more legible than the others. Giuseppe says that perhaps it depends on the machine, because he knows that they do not always use the same machine in the department. The chief asks who wrote the scan report. Maurizio looks at the EPR but it does not give the name of the doctor. He then looks inside the folder containing the EPR print-out but cannot find the report. The chief consultant asks if there are other examinations he can look at, and Maurizio finds a bone scan in the folder. The scan shows a bone asymmetry, and the chief consultant decides that the patient's walking difficulties are due (at least partly) to this.

Hence, the same examination assumes different meanings according to the machine that has been used; the same report may differ in value according to the doctor who has written it;

and the meaning of both may vary further according to the other examinations and reports considered. Re-evaluation of a clinical situation, therefore, does not stop with the objects and their assemblage, but goes beyond them. The chief consultant's negative comment on the quality of an object (a CAT scan), the suppositions on the 'behaviour' of the machine with which the object has been in relation, the request for information on human intrusions in the relation, and the subsequent search (in the folder) for other objects able to give information on the patient's condition, are all elements that relate on the one hand to the need to situate objects within the concrete organizational setting, and on the other to the 'material affinity' that links some of these objects together, facilitating (or otherwise) their relations. The materiality of the various objects influences their affinity, so that the paper copy of the EPR is paradoxically richer in information than its digital original. It is as if a clinical record, purely because it is made of paper, is automatically 'accommodated' by the objects surrounding it, which instead resist their de-materialization and inclusion in the EPR. This is why it may be important to pay attention to how objects are positioned in the EPR.

> The patient is described by Maurizio, who reads from the EPR [the chief consultant takes notes]. The patient has had a needle aspiration. the result of which is written in the 'Tests' box in the EPR. The chief consultant asks Maurizio: *Where are the aspiration needles positioned?* He is not referring to their 'positioning' on the patient's body, but internally to the software. He says to his colleagues that it is always better put the aspiration needles against the item 'Interventions', a item which the program automatically shows on every screen. Otherwise, a doctor may not notice what a colleague has done because he has not consulted the appropriate section.

The fragment highlights that it is important to pay attention to the 'positioning' of objects: some relations, in fact, may escape notice because they have not been positioned in sufficiently visible manner. This further indicates that the relations among objects cannot be taken for granted; that the EPR performs a monitoring function with respect not only to the state of the patient's illness but also to the doctors' action; and that, because an EPR reproduces a clinical record, it introduces diverse modes of consultation and compilation.

In any case, the chief consultant and the doctors appear to be entirely aware of the bias intrinsic to the knowledge contained in an EPR, as shown by this extract.

> The patient's CAT scan shows a large amount of metastasis, and Maurizio asks the chief consultant whether such a drastic metastatic spread is not a case more unique than rare. The chief consultant replies: *I've been in Oncology since 1973 and I've never seen anything like it!*

The chief consultant could have answered differently. He could have cited a recent scientific publication; or he could have calculated (using EPRs) the average and median metastatic spreads of patients treated since 2000; or he could have verified (consulting the EPR) whether there had been similar cases in the past. Instead, he preferred to refer to his own experience, a mode of knowledge transmission that has nothing to do with the digitization of information. The chief consultant's reply thus foregrounds the weight of concrete experience and tacit and aesthetic knowledge in medical and organizational decisions (Strati, 2003), and

the importance that these not be overridden by the EPR. Further evidence of this is provided by the third (and final) space in which learning of the EPR took place: the medical surgery.

The medical surgery:
The Electronic Patient Record meets the doctor-patient relationship

The medical surgery is attended by people who are not in therapy but have been previously (those that the doctors and EPRs call 'follow-ups') or will be (those that the doctors and EPRs call 'first examinations').

An external observer is immediately struck by the surgery encounters between doctor and patient and the way in which they follow a well-structured script – as evidenced by the following fieldnotes.

> When the doctor arrives in the surgery, the first thing he does is turn on the computer. Then he asks the nurse to call the first patient. But before the nurse does so, she tells the doctor that someone has come in with a CAT scan, even though she does not have an appointment. The doctor says: *I'll see her if we've got her clinical record, if not…* The nurse answers that the clinical record is not 'ready', because she only 'prepares' the records for patients with appointments. The doctor tells the nurse to bring the woman in anyway. He reads the scan report, talks briefly with the brother of the patient (who is not present) and, explaining that he hasn't got the clinical record, says that they will have to reconsider the case, and that they (the department) will telephone with the date and time of the appointment.
> The doctor turns to the nurse and asks her to call the next patient.
> The patient comes in and the doctor asks for her blood test results. The patient replies that she has given them to the nurse, who hands them to the doctor. He looks at them and comments (positively). The doctor then asks the patient to get ready for the examination. She undresses behind the screen, and lies down on the medical couch. The doctor begins to examine her. He palpates her abdomen, asking her to breathe deeply. He tells her to sit upright and taps her back, asking her to breathe in, hold her breath, and then exhale slowly (this operation is repeated twice). *Everything's fine, you can get dressed*, the doctor says as he goes back to his desk, while the patient puts her clothes back on and the nurse stamps some forms. The doctor writes the result of the examination on the woman's clinical record, inserts the blood test results, and places the folder to his right. The nurse, almost invisible behind him, takes the folder and puts it back in the trolley. *That's fine, see you next year!* The doctor gives the patient a letter listing a number of pharmacological prescriptions and says goodbye to the woman [once the patient has left the room, the doctor stresses that *the patients who come here need to be reassured … so you've got to use a very decisive tone of voice … you always have to say "that's fine"*].
> The nurse places the EPR print-out for the next patient on the doctor's desk, and asks if she should call her. But the doctor answers: *I'm sorry to disappoint you, but the patient isn't here … I made it up, because it was the only way to get the clinical record … I've been asking for it for two weeks!*

These brief notes highlight one of the principal features of doctor-patient encounters. As already pointed out in the literature (Good, 1994), they are highly ritualistic: the doctor's authorization of the nurse to summon the patient; the reading of the test results as the 'prelude' to the examination; the nurse as an ancillary figure mediating the doctor-patient relationship; 'getting ready for examination' as an interstitial moment marked by the patient's undressing behind the screen and lying down on the medical couch; the doctor's palpating as an investigative practice on the patient's body; the decisive tone with which the doctor manages the interaction, and the repeated use of expressions which reassure the patient: these are all elements which emphasise the performative and symbolic component whereby a series of actions/relations are translated into the stable frame of the 'medical examination'. Proof of this is the fact that if even one element is missing (the clinical record, the test results), the interaction does not take place; just as the presence of only one element may be sufficient for the entire frame to be activated (as in the case of the brother of the patient with the CAT results who did not have an appointment, or of the doctor who made a fictitious appointment in order to get hold of the corresponding clinical record).

To be noted, therefore, is that, like patients' reception at the Day Hospital, also this is an activity in which humans and non-humans align themselves along a continuum in which the relations among objects furnish an image of stability.

The stability of objects as a source of reassurance

The rituality of the encounters is intended to reassure the patients (as the doctor says), and this is a further reason why the objects must be arranged in orderly and coherent manner, for it is to these that patients first direct their attention – as the following episode illustrate.

> A nurse rings from the D.H. A patient has noticed that her clinical record refers to a tumour in the left breast, while hers is on the right. Moreover, there is a 7 instead of a 4 in her birth date, and the folder contains the examination results for someone else. The doctor says to the nurse: *Yes ... because there are two quadrants, the computer's taken the one first in alphabetical order ... explain it to her so she can understand* … Some minutes later, the patient in question arrives. She repeats what the doctor already knows and concludes: *I thought they'd given me someone else's therapy!*
>
> The doctor shows her that 7 is just up the 4 on the computer keyboard, so that the mistake is due to a typing error (because the writer was in a hurry). He explains that the computer imposes an obligatory choice between 'MDX' (right) and 'MSX' and automatically assigns 'MSX' by default (the patient does not seem very convinced by the explanation). He tells her that in any case the therapy acts expressly on the right breast and, as far as the other person's test results are concerned, though such slips happen, they make no difference to the therapy.

The episode highlights that reassurance is not imparted by the interactive rituals alone; rather, it is conveyed, and above all maintained, by a set of objects which 'appresent' (Knorr-Cetina and Bruegger, 2002)[5] the patient. It is probably this that accounts for the worry caused

by the absence or non-alignment of the objects in the clinical record. When the examination has been concluded and the ritual completed, what remains are the objects, which in the eyes of other actors do not represent nothing but are something in themselves: for the person preparing the pharmacological therapies a 7 is not the mistaken representation of a 4, just as a 'MSX' is not an inexact representation of a 'MDX'.

This is why in this situation the EPR and the computer appear on the scene, evoked as agents not entirely under the control of the human actors. In the episode described, the computer evidently serves as a scapegoat, with the doctor emphasising its rigidity (the computer imposes obligatory choices), inexperience (in the absence of information the computer always takes the same option), and deceptiveness (as the doctor describes it, the 7 is deliberately positioned up the 4 to deceive people into making mistakes); but it does not constitute a threat (to paraphrase the doctor, the therapy acts on the right breast whatever the computer might say).

A new *s-object* (Bruni, 2005) thus becomes part of the doctor-patient interaction and of the relations among objects. The doctor reassures the patient by translating what may have been erroneous interactions among humans to the plane of objects.

Performing reassurance and trust through the Electronic Patient Record

However, thus far the doctor-patient ritual has been performed without the help and/or participation of objects like the computer and/or the EPR. The doctor must consequently now introduce these new *s-objects* into the examination activity. Curiously enough, contrary to the rhetoric that depicts computers as 'intelligent machines', in the case considered here we find the computer reconfigured as a rigid, deceptive and inexpert machine; or, as in the following extract, one which is simply "a bit stupid".

> The nurse calls the patient, who is accompanied by her husband. The patient has come for her first examination, so a new clinical record has to be opened. While doctor sets up the new EPR on the computer, he explains possible therapies to the patient and the state of her disease (*everything's fine, the cows haven't got out of the barn ... I use this expression to help you understand the situation*). The woman smiles, and the doctor begins to compile the EPR: *Now I'm going to ask you some questions which may seem a bit stupid, but it's because the computer requires me to ask them*. He enters the patient's symptomology, the date of the operation, and the name of the doctor performing it. The examination in itself is very brief, but because it is a 'first examination' the doctor must feed the entire clinical record into the computer, and this takes time.

The doctor thus blames a non-human actor (the computer) for the lengthiness and monotony of a 'first examination' and establishes a relationship with the patient set at a different level, that of common sense ("the cows haven't got out of the barn" is the expression he uses to explain the state of her disease to the patient) and of trust. In this way the appearance of the EPR and the computer does not dispel the 'magic' of the doctor-patient

interaction. Indeed, it enables consideration to be made of how the EPR acquires the patient's trust.

As a corollary to the reassurance produced by the examination ritual, trust evidently performs a crucial role in encounters between doctors and patients. We have seen that EPR and computer are elements traditionally extraneous to such rituals, and that they are not presented to patients as objects that inspire trust. But as the following extract shows, the opposite may happen.

> The nurse calls the next patient. He is an elderly gentleman (accompanied by his daughter) who begins to describe his case in minute detail: symptoms, pains, operations, hospitalizations, therapies, examinations. As he talks, the doctor gazes at the computer screen and at a certain point interrupts him: *Yes, yes, it's all here on the computer, so don't worry*.
> (P): *Mah!*
> (D): *Why, don't you believe me?*
> (P): *Well, a man's got to see …*
> (D): *Yes, but if you come round this side of the desk I'll show you that everything's here* (points to the computer).
> [the daughter to her father] *Yes, go on, they're really organized, they've got the computer…*
> The doctor asks the patient to join him behind the desk and look at the computer screen. The doctor browses through the patient's EPR, showing him how examinations, test results, and past events can be retrieved. They then shake hands and bid each other goodbye.

There are, therefore, situations in which the presence of the computer and the EPR provide reassurance: the computer is synonymous with organization, and the EPR is an instrument which enables the remembering of even distant events. The EPR is thus 'learned' into the doctor-patient relation, not as an object that acts in the stead of a human professional, but rather as an object belonging vicariously to the patient.

Conclusions: learning and knowing as 'flirting' with material heterogeneity

What the implications of having shadowed a technological object (the EPR) as it was the 'latest arrival' in the more composite 'community of objects' in terms of learning and knowing in organizational activity?

The observations show how the technological object 'contends' with other objects for its practical relevance. This is particularly evident in situations where the actors prefer to consult (for example) the 'old' clinical records rather than the 'new' software. The EPR 'negotiates' with the objects already present in the organization for spaces of action. These are physical spaces, as in the case of the hospital ward, where the EPR is located only and exclusively in the doctors' room, but also symbolic spaces like the doctor-patient relationship, where the paper-based clinical record and the EPR assume different meanings and are taken on board

(by doctors and patients) at different levels of intrusiveness, even though they perform the same instrumental function. Thus, knowing and learning take place in scattered spaces and activities, involving all the elements (doctors, nurses, patients, other objects and technologies) present in the environment and, sometimes, reframing their meanings and relations. That is to say, the pattern of practical activities in which the object is involved.

In terms of *affordances*, the EPR differs from other organizational objects (primarily paper-based clinical records) in one important respect: its lack of materiality. This requires the presence of other objects that attest to its concrete existence (from a legal point of view as well): therapies, discharge letters, paper print-outs, letters to the GP, test results, are all material forms into which the EPR must translate itself in order to acquire organizational materiality and encounter other actors. Moreover, this lack of materiality makes sometimes difficult for the EPR the encounter with other objects and organizational practices (as in the Ward), requiring organizational actors to 'flirt' differently with the material heterogeneity of their everyday organizational activity.

This is evident in the doctor-patient interaction, where the EPR and the computer have to be introduced as new s-objects. Here the notion of *relational materialism* (Law, 1994) seems particularly apt in labelling at the same time the kind of reality that is constructed and how that construction is achieved. There is a whole set of objects, words and ritualistic interactions framing the doctor-patient relationship and the introduction of the EPR requires organizational actors to explore more into deep the actual frame, learning how and when connecting the new object with it. This learning and exploration takes place in situated interactions and does not take always to the same consequences. In fact, here the 'material heterogeneity' with which organizational actors 'flirt' finds in the patient one of its key-element. Thus, not only the EPR has to be introduced in relation of the existent 'community of objects', but it has to be learned simultaneously by the doctor and the patient. In this sense, the new object is learned relationally, through the doctor-patient interactions that it allows (or not) and as a constitutive element of those interactions.

But the research has shown also that the Electronic Patient Record is constituting itself into an artifact through which coordination takes pace, stressing how 'flirting' with technologies and objects marks out spaces, activates groups of actors and carries traces of past action. The EPR is a technology which 'works' inasmuch it is able to form and activate diverse groups of organizational actors, which, in appropriating it, simultaneously learn it and make it compatible with everyday work practices and the already-existing material heterogeneity.

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Endnotes

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[2] As defined by Michel Callon (1991), an 'intermediary' is any sort of entity which brings actors into contact and defines their relations.

[3] Some of the observations presented in this section appear (for different purposes) also in Bruni (2005).

[4] 'Preparing' a folder means organizing the documents; checking whether specific analyses have been ordered (and if so, fixing appointments with the relative departments); ensuring that the folder contains the results of all previous examinations; if the folder is in electronic form, printing out the therapy programme and binding it into the clinical record.

[5] The expression 'appresent' is borrowed from Husserl. It denotes the 'bringing into being' of an event and differs from 'represent' and 'present' in that it does not imply a difference between an essence (reality) and an appearance (image).

Stylistic creativity in the utilization of management tools

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Abstract

Management Research and Theories of Organization do not often explicitly expose the theory of instruments they use to study the role of management instruments, such as accounting, performance measurements, planning and budgeting, in organizational dynamics. We shall basically identify two theoretical positions about instruments. The first position, representation-based, substitutive and computational, responds both to positivist and cognitivist theories of action and decision-making in organizations, from Taylor to Herbert Simon. Management instruments then are seen as symbolic reproductions of logical phenomena which enable actors to "translate" their complex concrete activities to computable models. Another position, pragmatic and semiotic, views the tool as a semiotic artefact which is interpreted by actors as a sign and enables them to make sense of their collaborative action, in an ongoing and situated manner. The essence of instruments then is not a specular reflection of reality, but a mediation between actor's subjectivity and real objects, a way to build meanings out of situations of collaborative action.

Following the theory of activity based upon semiotics and Vygotsky's psychology, management instruments have two faces:

- on one side, on the object side, they are objective artefacts, which constrain utilization without determining a unique way of acting,
- on the other side, on the subject side, they are habits of utilization, i. e. interpretive schemes which enable the subject to interpret the artefact into a certain type of action.

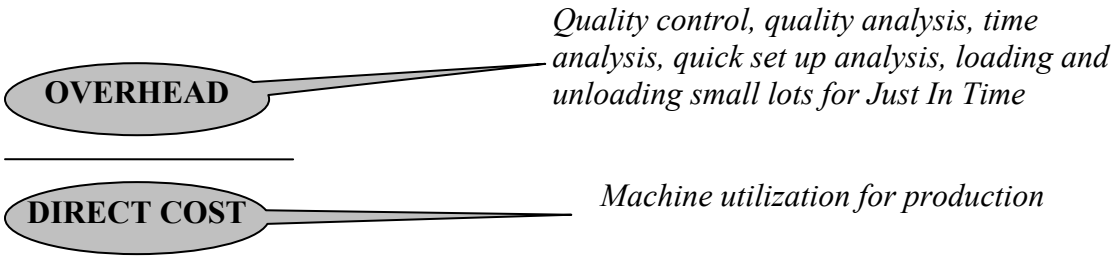
Both components, artefact and scheme of utilization, are linked, but they have a certain level of mutual independence.

The instrument utilization generates a "genus" (a generic class) of utilization, but leaves space for the personal "style" of utilization. The semiotic approach of management tools makes the actor a kind of permanent creator of the collaborative activity, a sense builder involved in an ongoing conversation with other actors to interpret instrument utilization. The actors are players who use instruments to conform to social rules but also to express their own personality. Instruments play a key role in this stylistic expression, since they make up the organizational language through which cooperation, communication, and collective sensemaking are possible. The interplay between "genus" and "styles" is a key mechanism for the genesis and the transformation of organizations.

Key words: instruments, sign, representation, generic, style, artefact, interpretation, habit, utilization, activity, collaborative activity, instrumental dynamics.

An adorable ratio…

Who said that nobody falls in love with a ratio? Some fifteen years ago, I was working as a controller in a large computer manufacturing group. During a meeting about the valuation of production inventories, I had a short discussion with the production manager about the performance measurement of factories. He told me that he was designing a new format for the performance reporting of corporate production, to manage the manufacturing activity in a more effective way. He asked me if I could help him by reviewing the first draft. When he sent me the draft, I was surprised to find as first indicator and head measurement the "overhead cost to direct production cost" ratio (O/DC ratio), to minimize[2]. In a firm where just in time material management, reactivity and total quality were key priorities, O/DC minimizing seemed quite counterproductive. Direct costs (DC) exclusively reflected effective production time (machines working), whereas overhead reflected time spent in loading and unloading machines, achieving statistical control of processes, controlling and improving quality, analyzing problems, cleaning… Of course O/DC priority in the scorecard prompted factory actors to maximize production rates and to sacrifice just in time and total quality management, in contradiction with the explicit manufacturing strategy of the company.



When I met the production manager I exposed the drawbacks of O/DC ratio in a diplomatic way. After hearing me, the production manager confirmed that « zero stock » policies and total quality were key features of the corporate manufacturing strategy. He proposed to revise his draft and to send me a second version. I received the second version a few days later, and I was amazed to find, as the first performance measurement… the O/DC ratio! We met again, and I resumed my previous explanations. He listened to me carefully and politely, then answered me: "I perfectly understand all of that. You might be partly right. But, you see, I am a manufacturer, and I supervise manufacturing people. It is our job, theirs, mine, to produce, not to optimize logistics or to clean shopfloor. When do we produce? When machines work, when products are made. Behind this, you see, there is a job, a craft, a history, a competence: we were trained to produce, and to produce as much as possible, as well as possible. When a machine stops, I can't tell them : *that's good*. I know that manufacturing people, when they do not manufacture, somehow are wasting their time, and that they know they are wasting their time and they are losing their values. In this country, engineers, technicians and manufacturers did not build what they built – a competitive

industry - to clean work stations, to handle materials by multiplying JIT small lots or to chat in quality circles. Everyone to his trade. Production is the basis of their professional pride, ethics and spirits. Therefore, we cannot do without that ratio, which shows us where we are in practicing our profession ». In that moment I understood two elements which so far had partly escaped my attention. First, my colleague was attached to that ratio, not in a rational way, but rather through strong affective links, because O/DC ratio for him was a sign, which referred to a complex system of professional values and beliefs, far beyond the crude algorithm which it seemed to be, in a way quite similar to the flag of a country, which means much more than the two or three colours which it exhibits. This emotional identification was even exacerbated by the situation of computer industry, which was moving from a traditional manufacturing model to a service model, in which the factory ceased to play an important role, or even ceased to play any role at all. Their professional pride was threatened, and that made the O/DC ratio even more loveable. My second discovery was that, through the O/DC ratio, the production manager was telling me a story, or even a history, the long and rich history of the computer industry, of inventors who designed smart calculating machines in backyards, who manufactured them in small workshops and later in factories, a collective history which generated fantastic and amazing objects and stretched in space and time far beyond his direct personal experience. I realized that an instrument which looked absolutely rational, like a cost ratio, could actually be a powerful symbol loaded with emotion, which transmitted the whole history of professional crafts and value systems, in the same way as a small object like a comb can tell us the daily life of ancient and vanished civilizations… I thought of Italo Calvino's novel "The invisible cities" and the way Marco Polo evokes Kublai Khan's empire through a small piece of wood: "Then Marco Polo spoke: your chessboard, Majesty, is inlaid with two types of wood: ebony, maple. The piece of wood on which you fix illuminated eyes was carved in a ring of the trunk which had grown in a drought year: can you see how the fibres are arranged? Here a knot, hardly visible, can be discerned: on one day of a precocious spring, a bud tried to sprout, but the night frost compelled it to give up (...). This is a bigger pore: maybe it was the nest of a larva; not of a worm, because a worm would have kept on digging ever from its very first time after birth, but of a caterpillar, which nibbled the leaves, and that is why the tree was selected to be cut down... This edge, here, was incised by the joiner with a chisel, in order to adjust it tightly to the next square, which protruded...

The amount of information which could be read in a small, smooth and empty piece of wood overwhelmed Kublai; Polo was already speaking of ebony forests, the floating of timber trains down the rivers, their landing, the women observing at their windows…"

O/DC ratio was like the small wooden square of Kublai's chessboard: a microcosm in which human actors could actually read the extension and the history of an empire, a culture, the manufacturing culture of performing machines and competent engineers… Not of course because "per se", intrinsically, O/DC ratio represented the manufacturing profession and its values: but in that precise situation, in that context of strategic change, it appeared as the last

fortress of an assaulted culture. The indicator could only be understood in the specific situation, in its pragmatic context of utilization and action, which gave it its actual meaning.

In the first part of this article, we shall see that there are two theoretical ways to analyze instruments, and more particularly management instruments, and their role in organizations: representation-based theories, and interpretation-based theories. In the second part, we shall develop the interpretation-based theory, which recurs to a semiotic and pragmatic approach of activity, organizations and instruments. Then we shall study the specific relation between instruments and collective activity, in the third part of the text: in relation with collective activity, instruments have a double and contradictory function of generating coherence and expressing local variance. In the fourth part we shall focus upon the second function, the local variation, and we shall analyze it as a stylistic individual and local creativity in the utilization of management instruments. In the last part we shall identify some managerial implications of this approach of instruments.

Two theoretical positions about instruments

In the history of organization and management sciences, instruments, and particularly management instruments, have been studied by authors in very different ways: as examples, let us mention Frederick Taylor and the role of standard times and standard cost in "scientific management" [Taylor, 1911-1972], the "artificial systems" analyzed by Herbert Simon [Simon, 1981], the role of management and accounting techniques in the historic emergence of new forms of organizations [Chandler, 1977], the decoupling of institution-based management systems and actual practices within the organization [Carruthers, 1995], the pragmatic role of tools as the semiotic mediation of collective action [Lorino, 2005], the political dimension of management systems as vectors to maintain and reproduce structures of power [Hopwood, 1987]. We shall basically distinguish two types of theoretical positions about instruments:

1. In the 1st group, theories are *representation*-based, substitutive and computational ("R" theories). They can be found in the rationalist views of organization ("one best way", instrument as accurate representation of real activity), as Frederick Taylor's [Taylor, 1911-1972]: taylorian standards are defined as exact models of efficient ("one best way") action. We can also find this type of theoretical position in the cognitivist theories of organizations (bounded and procedural rationality, human thinking as symbolic and computable modelling), originally developed by Herbert Simon [Simon, 1981]: thought is described as a logical information processing procedure, likely to be implemented in different physical substrates such as brains (human knowledge) or computers (artificial instruments).

   In this type of approach, the operational effectiveness of management instruments is credited to their capacity to replicate some kind of reality, be it the reality of actual action (substantive rationality) or the reality of the logical processes of thinking about action (procedural rationality). Since those theories also define knowledge as representation of

some objective reality (representation of action processes in their real environment and of logical processes of thought), instruments appear as consubstantial with knowledge: by carrying representations, they carry embedded knowledge, they *are* knowledge (knowledge = instruments = representations). It is then expected that instruments offer an amplifying *substitute* to human action and thought, an "acting automaton" in taylorism or a "thinking automaton" in cognitivism, thanks to symbolic reproductions which "translate" complex concrete activities and/or decision-making processes to computable models. The instrument is supposed to escape human subjectivity, seen as a potential source of errors and fallacies. It leaves only residual space to emotion and intuition, considered as breaches in rational management systems. As an example, let us recall that, in the traditional values of the accounting craft, a good accounting system must give a "faithful and accurate" image of the economic situation of the firm. In the present process of introducing new international accounting standards (IFRS standards), the new standards are often presented as a way to get a "more accurate" image of the "true" situation of the firm, and particularly to provide a better evaluation of its "fair value", after several financial scandals (Enron, Worldcom, Parmalat, Vivendi).

In this theoretical perspective, "organizational knowledge" is often identified with *common* knowledge, i.e. shared representations. Then it appears as a basic issue for organizations to move knowledge from individuals to organizations by moving it from individual and tacit to common and explicit. This conversion also appears as a way to memorize it and to improve it by gradually sophisticating representations. Reasoning follows the basic logical patterns of induction (building general representations from singular experiences) and deduction (controlling singular experiences through general representations).

2. The theories of the 2nd group are *interpretation*-based, pragmatic and semiotic ("I" theories). They view the instrument as a semiotic artefact to be interpreted by actors, as a sign in the sense of pragmatic philosophers [Peirce, 1958], i.e. involved in a triadic interpretation, where (1) the sign replaces (2) the object "*for* (3) *something or someone from a given point of view*": the relation between object and sign is always mediated by some concept, some interpretive scheme which Peirce calls "interpretant". The typical example of this triadic relation is the word in common language. It replaces an object through a concept. The word "table" replaces this singular and concrete object on which I am writing, for my communication with people who know what a "table" is, and this substitution is made possible by the concept of table which allows to include this unique object in the generic class of what my readers and me call "table". In a similar way, the management accounting system replaces the unique concrete *hic et nunc* activity of this milling workshop with a number, the activity cost, and in doing so it integrates the unique concrete activity in the generic class of activities which have this cost level.

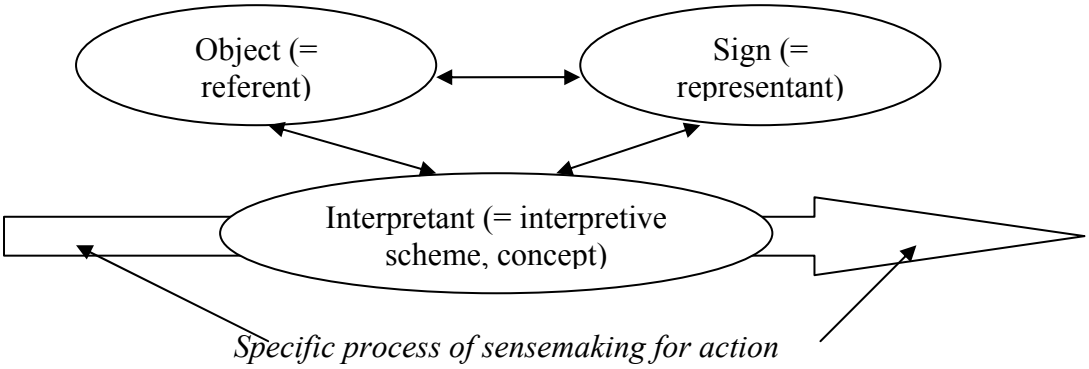


Figure 1: triadic interpretation (Peirce)

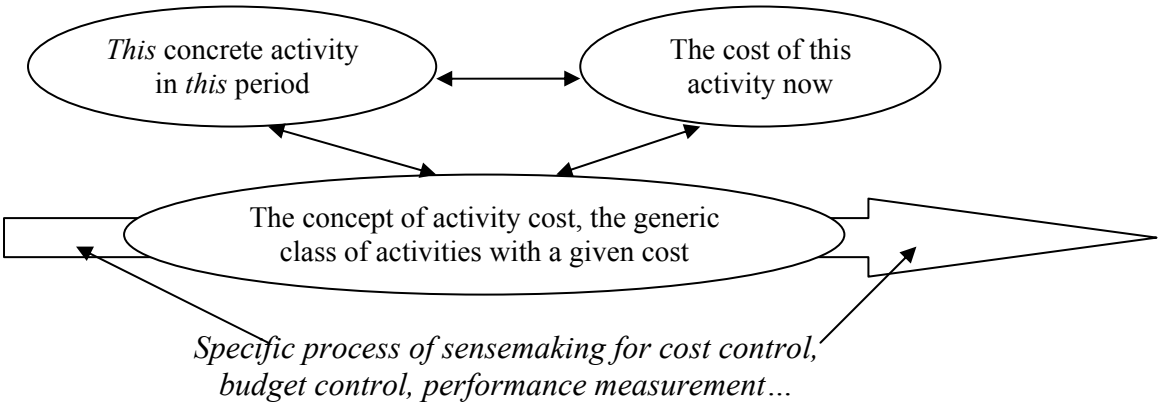


Figure 2: triadic interpretation applied to cost accounting

Those theories define knowledge, or rather "knowing", as the dynamic situated process of interpreting situations to act upon them. Collective action raises the issue of *making sense* of situations in such a way that action can be performed, rather than *representing* situations. "Knowing" appears as a tendency to interpret a certain type of situation in a certain way, a "habit" in the sense of Peirce[3].

Management instruments are not "representations", but artefacts involved in activity to support sensemaking. They do not have a relation of *truth* with real activity, but a relation of *meaning*. The shape of the instrument may replicate some aspect of the organization and make it visible. We say then that the tool has an iconic nature. For instance, the cost of the activity is supposed to have some common structure with the actual resource consumption of the activity. But in other cases the shape of the instrument may have nothing to do with the real features of activity; its link with the activity is purely conventional; we say then that it has a symbolic nature, like the knot in the handkerchief which triggers a specific action in spite of having no functional shape at all. Even when it is iconic, the instrument is

interpreted by actors and its theoretical status is closer to Nonaka and Takeuchi's metaphor [Nonaka and Takeuchi, 1995] than to some mimetic reproduction of reality.

In their article about R.O.I. (Return On Investment), Swieringa and Weick [Swieringa and Weick, 1987] admit that R.O.I. in many cases is a very bad representation of the collective activity, but they stress that this does not preclude that it may be an excellent instrument to sustain collective activity: people believe in it, understand it, use it as a communication language, and find in it an effective sensemaking instrument to act together. The semiotic and practical effectiveness of the instrument is not related with its quality as a representation.

In this theoretical frame, besides the logical patterns of induction and deduction, reasoning requires the pattern of abduction (for instance through storytelling)[4]. For instance, in the case of quality inquiry, when a team faces a new type of quality problem, the inquiry requires to build new hypotheses, to find a plausible story, to give a credible account of the situation. Instruments play a key role in this construction of hypothesis, as inputs (they structure the studied phenomena) and as outputs (they can be modified).

In this group of theories, we include pragmaticism, semiotics, structurationism and situated action or cognition.

Table 1 synthesizes R and I theories of knowledge and instruments. Those theories should not be considered as excluding each other, but rather as complementary, according to the organizational level of complexity and uncertainty.

Theories R	Theories I
Representation	Sign
Organizational knowledge = common knowledge	Organizational knowing = conjoined, mutually combinable habits of action
Objectified, reified knowledge (storable, transportable)	Interpreting subjective habits (likely to produce signs for other actors)
Making instruments = making knowledge explicit	Making instruments = producing new signs to make sense of action
Dyadic instrument: artefact A representing B	Triadic instrument: artefact A meaning B for someone C in a context

Table 1: theories "R" and "I" of knowledge and instruments

The semiotic and pragmatic theory of instruments

The instrument mediates action

Our concept of "instruments" includes technical tools, languages, rules, procedures, formal division of labour: any artefact involved in collective action and interpreted by actors to make sense of their action. In the semiotic and pragmatic approach, as we have seen before, the

essence of instruments is not a specular reflection of reality, but a mediation between actor's subjectivity and real objects, a way to build meanings from the infinite and chaotic diversity of concrete experience. Instrument utilization appears as a permanent interplay between human subjects and objective contexts. It establishes a distance between the subject and his action and enables reflexive thinking about action. This pragmatic view opens the way to the theory of activity: "to explain work as a human activity appropriate to a specific purpose, we cannot limit ourselves to say that work originates in aims, but we must explain it by the use of tools, without which work could not appear" [Vygotsky, 1986].

Instruments are designed on the basis of experience, and they organize the interpretation of new experience. Consequently the relation between experience and instruments is somehow circular [Dewey, 1938], which entails the danger of cognitive traps and calls for particular forms of vigilance in the utilization of instruments.

The instrument combines objective artefacts and subjective habits of utilization

Instruments have two faces:

- on one side, on the object side, the instrument is an objective artefact, or a system of material or symbolic artefacts: material objects, drawings, texts, speech, gestures. The objective nature of the instrument, its artefact part, constrains utilization: it is not possible to do everything with it (it is not possible to play piano with a saxophone). But it does not determine its utilization, there are multiple ways to act with the same artefact, some of them may be quite surprising. Reciprocally, the same type of action can be accomplished with distinct types of artefacts.
- on the other side, on the subject side, the instrument is a habit (=mental predisposition) of utilization, i. e. an interpretive scheme which enables the subject to interpret the artefact into a certain type of action. The utilization habit is based upon the individual and the social experience and builds a generic type of activity (the activity of "using this instrument").

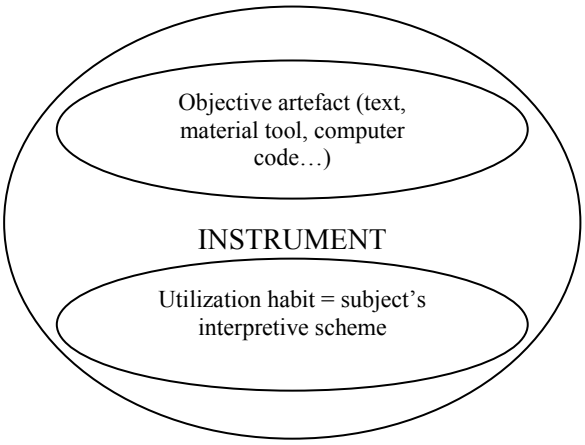


Figure 3: the two faces of instruments

Both components, artefact and habit of utilization, of course are linked, but they have a certain level of mutual independence. The artefact orientates towards a "genus" of utilization, but leaves space for the personal "style" of utilization. In some cases, the "genus" of utilization changes radically (for instance, the blind man uses his white cane to defend himself against a thief) – psychologists and ergonomists then speak of a "catachresis" of the instrument.

By designing and using instruments, a given habit of action can be re-implemented in new situations as long as these situations still belong to a certain "genus" of situations. The habit of action related with the instrument is *generic* (relevant for a "genus" of situation and action) [Dewey, 1938].

In designing an instrument, the potential activity is interpreted by the designer into the design of the instrumental artefact. When utilizing the instrument, the artefact is interpreted into the concrete activity using the instrument.

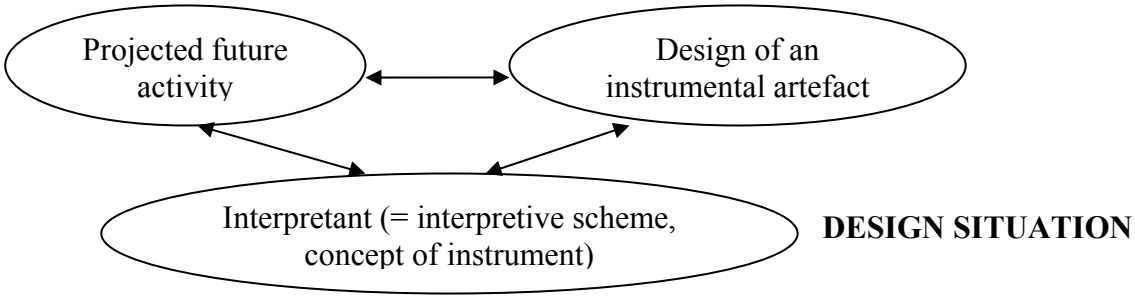


Figure 4: the instrument design as a triadic interpretation

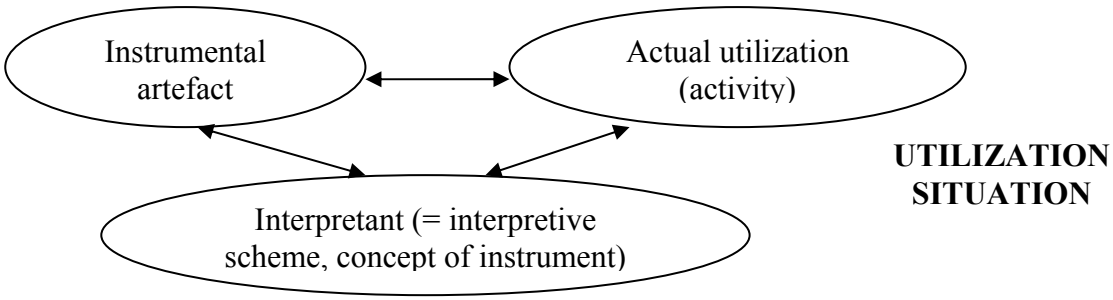


Figure 5: the instrument utilization as a triadic interpretation

Generally, the interpretive schemes of the designer and the user are more or less similar, so that the instrument appears as a way to implement and reproduce a certain way of acting based upon the initial design. For instance, the management controllers in fordian

manufacturing environments designed a management instrument: the "hour rate", i. e. the total manufacturing expenses divided by the number of standard hours produced. They designed it to orientate producers towards productivity maximization. When users interpret it in a fordian interpretive habit too, they try to minimize the rate and as a consequence to maximize local productivity, as expected by the designer. But if they interpret it in a toyotian interpretive habit, for a given level of market demand, they can see the decreasing level of the rate as the sign of high production for stocks, and the probable increase of inventories is a bad performance from the Just In Time point of view. The meaning of the instrument can undergo deep transformations from design to actual utilization, according to interpretive schemes involved.

The instrument "inscribes" situations and action in registers of meanings which give access to new potentials for action

The instrument translates the concrete activity into a certain register of meanings (for instance, text, or mathematical model) which gives access to new potential actions. When a firm establishes a system of management accounting, each activity can be translated into cost, i.e. a figure which allows to compare different activities, to compare the same activity throughout different periods of time or to compare it with competitors, to sum up activities into a global budget... It will allow performance analysis, or targeting and controlling action plans, or identifying variances between budgeted and actual cost. This "inscription" of activities is very similar to the "small fire, big fire" game used by Wittgenstein [Dumoncel, 1991; Wittgenstein, 2003] as a metaphor. Several players look for a hidden object in a house. One of the players knows where the object is, and he qualifies the other players' spatial positions with the words "small fire", "medium fire", "big fire" according to the distance between the hidden object and the player. By doing so, the master player translates the concrete and singular world of movements and positions into another register of meanings, the three-level scale "small", "medium", "large". This language is much poorer than reality (in the same way as the language of cost is infinitely poorer than the world of concrete activity). But it opens potentials for action: selection of direction, speed of movement. It gives their meaning to physical moves.

The instrument frames the knowing and acting capacities

When opening potentials for future actions, management instruments exclude many other possibilities. On one side, they create new territories for action, on the other side they close many. They "frame" knowing and acting capacities [Bateson, 1972]. In the example of management accounting, the way cost centres were carved in the organization makes impossible to follow cost on other types of perimeters. If we order cost centres in the sales and marketing department along product lines and not market segments, it will be impossible to make economic sense of the situations with reference to a market segment interpretive

scheme. The instrument builds phenomena, labels them, excludes and gives access to new fields. This framing characteristic is essential, because it is the basis of the practical power of the instrument. Swieringa and Weick, in their article about R.O.I. [Swieringa and Weick, 1987], mention as a decisive quality of R.O.I. the limited number of interpretations it allows: if the instrument allowed a very high number of interpretive possibilities, it would be a very good analysis tool (it would allow to scan all possibilities), but it would be a disastrous tool for action (actors would spend their time scanning and evaluating scenarios instead of acting).

2.E. the instrument abstracts learning and interpretation from the direct experience

The instrument links the concrete singular "hic and nunc" experience with general "types" or "genus" of experience [Dewey, 1938]. As any sign, it makes the absent (far away, past, future) present by "representing" it by signs. In that way, it frees activity from the spatial and time limits of experience. The activity cost makes the purchaser's past negotiation present through the material cost of to-day's activity. It permits distant activity interpretation and "action at a distance" [Robson, 1992]: headquarters will have a view of the activity of foreign divisions through management instruments. Past, present and future costs will be gathered and compared in a synoptic report. Actually, management instruments build the organizational space and time by defining perimeters and periods. For instance, the project management system "carves" projects in the organization; business process re-engineering builds new action communities (process teams).

Some theoretical implications

The pragmatic and semiotic view has some important theoretical consequences, at least for the study of instruments.

First, there is no "embedded knowledge" in instruments. Rather than a static state, knowledge appears as the process of "knowing in acting" - always interpretive. Embeddedness can be used as a convenient metaphor (things happen "as if" knowledge was embedded… for certain generic social and cultural contexts). or a way to shorten explanations, but strictly speaking there is no embedded script or routine in artefacts. Of course, as mentioned before, artefacts constrain action, but we could speak of "affordance" [Gibson, 1977; Norman, 1988] rather than "embeddedness". Affordance is not knowledge embedded in the object, but an attribute of the relation between the object and the subject, combining some objective shapes of the object and some capacities of the subject. The designer can give certain shapes to the instrument and those shapes can provide potential affordances for future relations with users, but it is not automatic nor predetermined. The affordance is transformed into actual utilization through the interpretation of the instrument by its user. The utilization of instruments (including languages) has always a pragmatic dimension, situated in a specific context of action. An instrument is never used twice in the same way, even if intelligent subjects can build "genus", generic classes of action and situation, as habits of utilization. Even in the case of apparently opaque tools, that users

involve in their action without being able to interpret their internal mechanisms (for instance a robot or a computer), the concept of utilization is obviously more complex than just "pushing the button" to benefit from some embedded knowledge: utilization is a complex social activity, which involves different types of actors: direct users, maintenance and system updating engineers.

A second important theoretical consequence is that instrument production cannot be described as the simple conversion of one stable core of knowledge from a "tacit state" to an "explicit state". Developing artefacts is something else, more complex, than "making explicit". The production of any artefact, including speeches, descriptive discourse, stories, models, about action is always the production of an instrument, an "instrumental genesis" of the activity. Rather than conversion of tacit into explicit, it is the production of "something new", that "something" being interpreted both by the designer and by the user, and not necessarily in the same way. Nonaka and Takeuchi [Nonaka and Takeuchi, 1995] very rightly stress the abductive and metaphoric dimensions of knowledge creation (a poetic metaphor is not simply the "explicit" mirror of some pre-existing tacit sense), but they seem to enter into a contradiction when they assimilate the "spiral of knowledge creation" in the firm as a sequence of conversions from tacit to explicit and explicit to tacit. As the language philosopher John Searle argues in his theory of "speech acts" [Searle, 1969; Searle, 1979], any form of "explicit" sign, as a speech, is a situated act which generates meanings related with the pragmatic context of action.

Instruments and collaborative activity

The concept of collaborative activity

Interpretation processes, actors' discourses, instrument utilization respond to other actors' interpretations, discourses, instrument utilization. Instrument utilization involves multiple actors, users as well as designers. Each of them *meets other actors in the instrument*, which is inhabited by "others". Actors are involved in collective inquiries, a form of collaborative activity which involves conversational sensemaking processes and dialogical processes [Bakhtine, 1929-1973-1977]. Collaborative activity includes:

- a certain configuration of individual activities;
- instruments of different types and levels. Wartofsky [Wartofsky, 1979] distinguishes primary, secondary and tertiary artefacts: primary artefacts directly used in action, secondary artefacts used to interpret action and to develop it, tertiary artefacts used to interpret learning processes and to build new forms of action. This typology converges with the notions of "single loop learning", "double loop learning" and "deutero learning" used by Argyris and Schön [Argyris and Schön, 1978].
- a structure of roles, which is a complex combination of elementary task definition, the combination of tasks into social roles, in a more or less mobile and flexible division of labour.

Collaborative activity can take two forms. In *common activity*, the actors have an equivalent practice and they use similar instruments for similar purposes (for example, the different sellers of a commercial network have the same type of activity, their collaborative selling activity is a common activity). In *joint activity*, the actors have different practices and they use either different instruments or similar instruments for different purposes. For instance, the different actors of the procurement process in a manufacturing company (engineers who specify the parts and services to purchase, purchasers, quality controllers, accountants, logistic managers, users) can use the same software, but each one will use it for different transactions. Their collaborative activity, the procurement process, is a joint activity. Distinct but "conjoined" interpretive schemes are a key way to provide organizational knowing. For instance, the musicians of a jazz quintet do not play the same instruments, part of their knowledge is quite distinct, but the collective activity lies upon the complementary nature of their instrumental techniques and practices.

Instruments as coherence-generating constraints

Instruments constrain interpretation and action, they have what we called before a "framing" power, through two mechanisms. First, as objective artefacts, they limit action possibilities by their structural characteristics. If the tasks caused by non-quality have not been identified as such in the design of management accounting, it will be objectively impossible to manage non-quality cost. Second, the utilization habit, which is a subjective interpretive scheme, depends upon the experience and culture of the interpreting actors. The actors involved in the same collaborative activity have partly similar experience and culture. This similarity often entails some generic habits in instruments utilization. Through those two constraining mechanisms (objective and cultural / community-based), instruments limit the possibilities of divergence in the practices of different actors and groups of actors in different places or at different periods. They contribute to generate coherence in space and time at different levels. They allow mutual understanding and establish a language for the socially viable expression of actors. For instance, when meeting for the quarterly reporting of business units results, the members of the executive committee spontaneously communicate in terms of margins, revenue growth rates, inventory turn over, new product "time to market", customer satisfaction rate.

When an instrument is new, it raises difficulties, doubts, surprises. The introduction of new instruments is a powerful abductive mechanism: it often requires to rebuild the story of collective activity and to build new hypotheses. On the basis of recurrent utilization, instruments can gradually become *blackboxes*. They are used without focusing attention upon them. Attention moves from the instrument towards the object of instrumented action. In the monthly business review, people no longer discuss the design of the management accounting system, they discuss about performance and objective fulfilment, using the accounting figures without questioning them, in the same way as musicians spontaneously communicate in terms

of harmony, chorus duration, cadence. The dominant reasoning mechanisms are no longer abductive, but deductive (specific application of a generic instrument in a given and singular situation: costing product A in month X, applying the general laws of costing in the firm system). But this "blackboxing" process does not prevent the instrument from being (re-)interpretable in case of necessity or desire.

Instruments are plastic and always interpreted

The instruments are signs *about* activity: they do not model and define activity in a deterministic and complete way. The way they constrain activity is always more or less incomplete and ambiguous. They leave space for local interpretation, adaptation to the specific features of local situations or to the new characteristics of an evolving activity. In some cases, when facing new types of situations, the actors cannot reach their objectives by using instruments in the usual way. In other cases, the usual way to use instruments does not fulfill their aspirations. In both cases, they have to adapt the instrumented activity, either by modifying artefacts (re-writing part of the computer code, for instance) or by changing the utilization habits of the given artefact. They follow the complete sequence abduction-induction-deduction which Peirce [Peirce, 1958] used to describe knowledge creation: surprise / doubt / difficulty in facing a new situation and observing that usual instrument utilization is not effective, building new hypotheses and a new story to understand the situation and rebuild the meaning of collaborative activity (abduction), abstraction / generalization of this singular experience and its translation into a new generic sign by modifying the instrument (induction), future utilization of the instrument in other situations responding to similar characteristics (deduction). This mechanism, which explains the continuous transformation of instruments and the adaptation of activity is close to what Latour called instrumental "translation", in the sense of "sliding", "move". Latour defines translation as "displacement, drift, invention, mediation, the creation of a link that did not exist before and that to a degree modifies the original design" [Latour, 1994].

We find a good example of such instrumental translation in the history of R.O.I. (Return On Investment). R.O.I. was introduced in Du Pont de Nemours corporation in 1912 by Donaldson Brown, who was one of the closest collaborators of Pierre Du Pont. The original utilization of R.O.I. was coherent with the type of company Du Pont was: family-owned, multi-divisional, with quick growth and diversification. Du Pont family needed to get a clear view of the return on their own capital in the distinct activities of the firm. They could compare the benefits of the respective divisions, but it did not give them a useful vision of profitability, since the profit levels were of course influenced by the size of the business units. So the idea of relating the profit with the volume of capital invested in the division (R.O.I.= profit / invested capital) was guided by comparability considerations. To make profits comparable, it was decided to neutralize the size effect by using a ratio. But, in later periods, R.O.I. appeared to managers (who were not owners) as a convenient way to determine which

investments to prioritize: from a weighed profit comparison, R.O.I. utilization moved towards investment evaluation and selection. Since division managers knew their personal evaluation would be based on the R.O.I. of their division, they tended to evaluate projects according to their impact upon divisional R.O.I. But the practical effects of R.O.I. then radically changed: whereas Du Pont family had tried to compare the yearly results of *divisions*, R.O.I. was now used to evaluate medium or long run investment *projects* within a one year horizon. Hence the endless debates about the biases of R.O.I. (short termism, investment deterrent).

Another example is provided by the quick diffusion of so-called "ERPs" (Enterprise Resource Planning) systems, i.e. integrated management systems. Many studies have been achieved about their implementation [Scapens and Jazayeri, 2003; Quattrone and Hopper, 2005; Granlund and Malmi, 2002]. It appears that in different locations of the same firm, SAP can be implemented in very different ways, with a different division of labour, a different distribution of power, different competence dynamics. But it also appears that all users speak of "SAP" as some well identified object and build mutual intelligibility by referring to it. The nature of the instrument is contradictory: it is a *common language* used to express *differences*.

The double nature of instruments (generating constraints and coherence, but also plastic signs which leave space for multiple interpretations and adaptations) makes them effective vectors for communication and collaboration: they allow actors to build a common background and mutual intelligibility, but also to express their own constraints, aims and personality, in a dynamic dialogue in which common semiotic references make interaction possible but new forms of meaning and practices can emerge. They are what Star and Griesemer call "boundary objects" [Star and Griesemer, 1989]: "they can intersect several social worlds by satisfying informational requirements of each" [Quattrone and Hopper, 2005]. They are "plastic enough to adapt to local needs and the constraints of the several parties employing them, yet robust enough to maintain a common identity across sites (…). Their structure is common enough to make them recognizable, a means of translation" [Star and Griesemer, 1989].

Instrumental dynamics and stylistic creativity in the utilization of management instruments

The notion of style in the instrumental activity

The computational view of instruments does not leave space for the creative invention of new forms of activity. Instruments appear as passion-killers, which should prevent personal interpretations. On the contrary, the semiotic approach of management instruments makes the actor a kind of permanent creator of the collective activity, a sense builder involved in the ongoing interpretation of the instrument and its usage. Since instruments are plastic enough to leave space for adaptation, each individual and collective user can transform the ways of using them. After Bakhtine [Bakhtine, 1973], Clot [Clot, 2005] and Barthes [Barthes, 1953], we shall describe this creation of specific practices in the use of artefacts as a "*style*", opposed

to the "*genus*", the generic habit of utilization in a certain class of situations. The stylistic creation responds either to the characteristics of new situations, or to the original profile of one (individual or collective) actor using the instrument (history, experience, project, values).

Where do stylistic creations come from? Through the "framing" function of instruments, huge potentials for action are excluded. Actual activity is only the visible part of the iceberg. A large part of activity is not activated, it remains potential, imaginary, and imagination is on the watch to introduce new utilization modes as soon as possible or as soon as necessary. The frustrated possibilities of action are proper to each actor, who imagines all that could be made and is not made because of instrumental and generic constraints. This domain of *impeded activity* works as a reservoir for potential stylistic innovations. At any time, any actor can perceive sudden possibilities to activate potentials that were inhibited before, because the collaborative activity requires changes or opens new margins of freedom. Instruments play a key role in this stylistic expression, since they make up the organizational language through which cooperation and collective sensemaking are channelled. They create the generic background upon which stylistic differences can be expressed. They are often the central focus of stylistic creations: activity is chaged by changing the way to use instruments.

Generic and stylistic elements of instrument utilization complete one another, and can conflict. Stylistic expression appears as a critique of the generally admitted and practiced "genus". For generic practices, stylistic interpretation appears as a deviation. A large part of the organizational dynamics takes place in this interplay between instrumental genus and styles.

Emotion and creativity in the stylistic use of management instruments

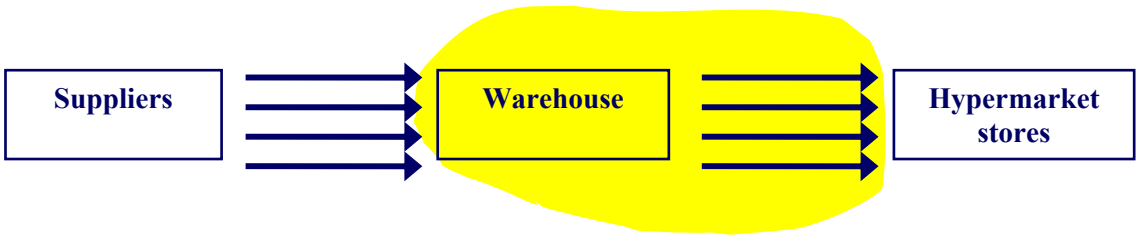
The main resource for stylistic creation is the universe of *imagined but frustrated* utilizations. Human actors permanently review actual activity and instrument utilization by comparing it with their virtual world of action, their "proper body" in Merleau-Ponty's words [Merleau-Ponty, 1945]. In the same way as the poetic imagination of the artist is permanently faced with the limits of technical processes (syntax, prosody, material to be sculpted) available for expression, the formal procedures and the tools oppose their resistance to the subjective aspirations of intelligent actors. This opposition is a challenge for creativity, and as such it is often appraised as a source of excitement and creation. The French poet Stéphane Mallarmé [Mallarmé, 1898-1945] pioneered modern literature by putting language and formal constraints in the focal centre of artistic creation. Without constraints, no creativity! For instance, process modelling, a very formal method of organizing, can generate fundamental questions such as: "is logistics a support of manufacturing, or is manufacturing a support of logistics (value-added logistics), or are logistics and manufacturing supports of the intangible engineering process (designing, developing, modifying product concepts)?" Each of these three ways of modelling value chains and processes corresponds to a different cultural and

social world: the world of material transformation, the world of spatial moves, the world of concept design.

In the activity we find a permanent and emotive tension between actual and potential instrument utilization. Due to its semiotic nature, the instrument can be loaded with the affective values attached to the context for which it was designed: the O/DC ratio mentioned in the introduction carried the whole manufacturing world, characterized by the ethic and professional values of manufacturing engineers. Killing the O/DC ratio meant killing the manufacturing culture of the company.

Let us mention another example. In March 2000, the mass distribution group Carrefour started an integrated logistics project called SCME (Supply Chain Management Europe). It aimed to the integrated management of logistic flows: "in a cross company network, improve long term performances of the firm and of the supply chain as a whole". The project revolved around a core strategic concept: the hypermarket store was seen as the key segment of the supply chain; everything should be made to improve its performance: just in time delivery to the hypermarket, quick unloading of trucks at the hypermarket, as small as possible on-site storage, to free precious urban surfaces for sales (legal constraints made hypermarket extensions nearly impossible). This approach was synthesized in two performance indicators: delivery time to hypermarket, inventory turn over. But shortly after the project was started, Carrefour merged with another group, Promodés. Promodés organization was based upon franchised stores and regional logistic platforms, owned by Promodés, which provided the stores with goods. Regional logistic platforms were managed by Promodés as profit centres. So Promodés strategic vision of their supply chain was quite different from that of Carrefour: they viewed logistics as one of their autonomous activities, a source of profit. Since Promodés had long run contracts with franchised stores, which planned fixed prices for the logistic service Promodés provided them, the meaning of logistic performance for Promodés was quite clear: it had to minimize the cost of operations in order to maximize profit margin. This approach was synthesized in one key performance indicator: the cost of logistic operations in the regional platforms.

Those two instrumental systems of interpretation induced divergent practices. For instance, to minimize unloading time in the stores, Carrefour used to load one different pallet for each sale department, even if the pallet was half empty, to avoid internal moves of pallets. Of course Promodés considered this practice as a nonsense since it increased the cost of transport. For months, the supply chain gave rise to endless – and hopeless – debates, which resembled deaf and dumb conversations between people who speak different languages: "you manage badly since your delivery time is higher", "you, not us, manage badly since your logistic operation cost is higher". In this instrumental conflict, there was a considerable amount of emotion involved. By defending a certain type of indicator, the managers actually defended their company, its strategy, its organizational choices, its history, which to some extent was their personal history. Indicators were patriotic flags.



Promodés: indicator = warehouse logistic operation cost; the world is centred upon the warehouse.

Carrefour: indicator = delivery time to hypermarket; the world is centred upon the hypermarket.

Unsatisfied desires for activity are reserves for stylistic creation, in a creative way of thinking which generates emotions. Stylistic creation often starts with unsatisfaction or conflict. For instance, a few years ago, one of the key performance measurement for design and engineering department at Hewlett Packard was "Time to market" (TTM): how long does it take to develop a new product, from the very first studies to the product starting up on the market? But some of the engineering managers were not satisfied with this measurement, since they usually asked their engineers to help manufacturing and sales departments in the first months of existence of the new product: there were always some technical or functional problems to solve, either in the factories, or in the after-sales services, for which the developers of the product were very helpful. But in doing so, from the "TTM point of view", they "wasted their time", since the product had already been launched on the market and they had better dedicate their time to help developing new products. So an unpleasant feeling grew about TTM: "it does not really express our job". To communicate with engineering teams, the engineering department started using another indicator, derived from TTM by adding the lapse of time necessary to reach the break even point of the product (how long does it take to have the original investment repaid by product revenues). In doing so, they rebuilt another engineering story, in which engineers are not only people who design nice products, but also people who make profitable products because they take care of the manufacturing and sales constraints and assist producers and sellers in the first phase. Before becoming the official HP indicator, called « Time to Break Even » (TTBE), it was a local and stylistic transformation of the performance management of the department.

When I was a controller at Bull computer company, I had to re-design the management accounting systems of the factories. One of the factories manufactured high range professional printers. We decided to implement a new type of cost accounting system, an ABC (Activity-Based Costing) system. Cost centres had to be cut out following an activity

analysis logic. One of the identified activities was “machining metallic parts for the printers”. After some time, the local controller introduced a small coding modification to distinguish two classes in the parts produced, according to their destination: parts bound to be assembled into brand new printers within the same factory, and parts (the same physical parts) intended to become spare parts for printer maintenance in the after sales service network. He made this distinction because the logistic aspects of both flows were quite different: they had not the same urgency, nor the same lot sizes. When he did so, we realized that spare parts accounted for 60% of the factory workload, but the factory had not been designed as a spare part factory. It was the first move towards the redesign of the factory organization around two business lines: the process of after sales maintenance, and the process of new printer production and sales. This change had been hard to imagine before: there were emotional difficulties in admitting that the factory was not only, and even not principally, a factory of new products, but rather a support to after sales services.

A move in a performance indicator can originate – or symbolize - key changes, through all kinds of emotions. A cloth manufacturing company based in Alsace used to follow the “order –to-delivery” time as a key performance indicator to control their logistic performance and the inventory turn over. Thanks to technological innovations, they could reduce this cycle from 10 to 2 days (for deliveries to cloth shops in town, which sold cloths to the final customers). The indicator was read as an economic sign, related with circulating assets and the cost to finance them. Some day, one of the executives read it as a strategic and commercial indicator: “I believe most of our final customers are ready to wait two days to get their clothes. In that case we can produce and deliver in less time than required by the final customer, which means we could only produce already sold cloths. Could not we become “making to order” instead of “making to stock” manufacturers? But in that case, could not we go even further, by selling only “made to measure”, “customized” clothes to our customers, *by finalizing the cloth design after the customer has ordered*? Could not we become sort of *industrial tailors*?” The indicator had triggered a whole story, still a fiction, on the mode “and what if we did… and what if we were… let us gamble…” But the story was converted into action: by using electronic networks and laser-based measurement of customers sizes, they could completely redesign their value chain. It was a deep change in the meaning of their activities: direct responses to final customers, complete integration of design and manufacturing, no more product inventory, and last but not least, the sellers did no longer sell a physical object they handled to the customer, but a concept (catalogue of patterns, materials and colours).

Stylistic creation with management instruments can involve many kinds of emotion: political or psychological resistance, excitement for novelty, desire to surprise other actors through astonishing interpretations and practices, defense of a distinctive identity in some specific utilization of some instrument.

The instrumental dynamics of activity

In the abductive model of reasoning involved in instrumental dynamics (difficulty/failure/doubt/surprise, search for a new plausible story/a new instrument, instrumental creation/adaptation, inductive generalization, deductive applications to new situations), different types of abduction can be met, according to the level of innovation. In most cases, the abductive mechanism is a "selective abduction" [Eco]: the utilization scheme is searched in an existing repertory and there is a transfer of utilization habits from one area to another, rather than a radical invention. Instrumental dynamics then responds to what we called before "translation": there is a limited drift / displacement in the utilization schemes. In other cases, the utilization mode can be totally and suddenly transformed, because the actor faces quite a different type of situation or rebels against the proposed interpretive schemes. It is like the invention of a new instrument, though the artefact itself is still the same. Ergonomists and psychologists speak of a "catachresis". Clot [Clot] tells us the story of railways drivers who must give up manual driving to leave centralized automatic control of the machine in rush hours, for safety reason. They discovered that they can switch on the automatic system, when they wish, but partially, just to get indications of where they should be, keeping the manual control of the machine. They started to use the system as a game, by counting the number of times in which the system signalled excessive variances, and they tried to beat records of accuracy (minimizing the number of alerts) on given routes. That game proved to be very useful to keep their vigilance level in routine trips. The automatic driving system became a vigilance support tool, which was not planned at all by the designers.

There is a permanent interplay between genus and styles. Different local styles can meet and cause conflicts, competition, debate, or they can mix.. A stylistic creation can be rejected or can be imitated by others. If it is imitated, it can gradually transform the "genus". The stylistic transformation of the genus is often consolidated by modifying artefacts: the new utilization habit "migrates from" interpretive schemes towards new objective characteristics of the artefact (but they are not mechanically embedded in the artefact).

Managerial implications of the interpretation-based theories

Communities of inquiry

The actors involved in the collaborative activity which makes use of some instrument are the only persons who have an actual experience of using the instrument and can therefore modify its practical meaning through the continuous flow of new usage. To develop this capacity of learning mediated by instruments, it is necessary to allow reflexive and ongoing inquiries of actors themselves about their own collaborative activity and their own instruments. The actors of a collaborative activity establish a "community of inquiry"[5] to continuously adjust their instrument utilization and rebuild the sense of their collaborative activity, through collective inquiries [Dewey, 1938]. Sensemaking never ends, because the

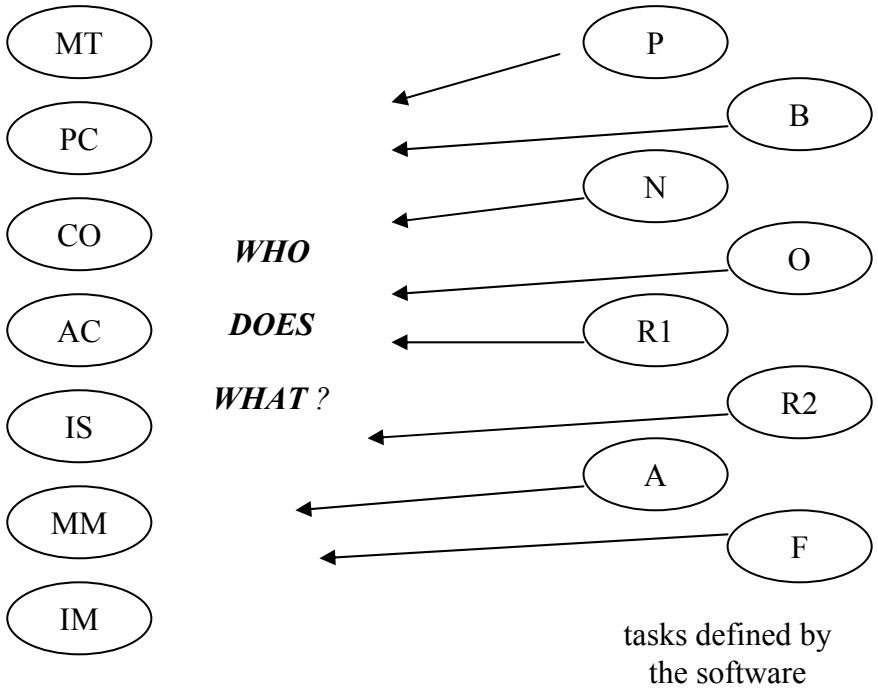
context and the actors keep on changing. One of the main tasks of the communities of inquiry concerns instruments: the community members reflexively examine their instruments to reinterpret their utilization or even their design. Such examples of communities of inquiry can typically be found in project teams, process management groups or process re-engineering groups.

SAP at EDF

At EDF electricity company, the ERP SAP is in the process of being implemented in the whole company. It is particularly applied to the procurement process. SAP leaves many organization options open: different scenarios of division of labour, optional tasks (for instance, for each purchasing act, there can be two budget controls, one a priori, one a posteriori, or only one, a priori). The production department of EDF defined five target procurement processes, according to the type of purchased article. Those target processes are target descriptions of the future collaborative activity, defined by functional services at the headquarter level. They had to be interpreted by actual users, to determine actual field practices with SAP. Constraints were imposed, either by the SAP software intrinsic characteristics, or by EDF headquarter decisions about target procurement processes. For instance, for some types of procurements, there is a list of homologated suppliers, and it is impossible to buy those articles from other suppliers (EDF generated constraint). The variance between the authorized amount and the actual amount cannot go beyond a certain percentage (SAP generated constraint). Constraints, political choices and cultural habits defined a corporate "genus" in the practical utilization of SAP.

In the procurement process as it is tooled by SAP, the software system defines basic tasks: prescribing the need (P), checking the budget availability (B), checking the specification conformity with general technical rules, negotiating with potential suppliers (N), ordering (O), checking the delivery from a technical point of view (R1), checking the delivery from an amount point of view (R2), authorizing payment (A), registering the transaction in the accounting system (F), registering the asset in the balance if the purchasing operation is an investment, checking the conformity of the transaction with the initial order, explaining deviations.

The new system concerned different types of actors, who inherited competences and interpretive habits (values, meanings) from their organizational history: maintenance technicians (MT), purchasers (PC), controllers (CO), accountants (AC), maintenance managers (MM), information system manager (IS), inventory managers (IM). A key question was: who does what? In some cases, the answer was imposed by the corporate *genus*. In other cases, the management tolerated variants, or left local choices completely free.



We made our inquiry in different types of collaborative activities: nuclear plant maintenance, hydraulic dam maintenance, administrative services to production units, engineering for the dismantling of old units, engineering for new processes, information system maintenance. We observed local interpretations of the task portfolio and its distribution upon actors. Some of the local "styles" were more or less imposed by the physical and technical characteristics of the activity. For instance, the team of engineering for the "dismantling of nuclear power stations" was located in Lyons, but the actual dismantling operations took place in Brittany, 400 miles away. So it was obvious that the tasks of defining the technical requirements (P) and checking the technical conformity of the delivery (R1) could not be entrusted to the same person, whereas in production units (nuclear or hydraulic) it was a golden rule that the person who defined the technical requirements should check the actual fulfilment of those requirements when the article or the service was delivered. In other cases, the stylistic local choices were inspired by feelings, priorities, emotive preferences. In the engineering unit, it was decided to entrust the secretaries with most of the administrative purchases, because the engineers felt they would waste their time in this type of task (including, for instance, important services such as professional training). In the other units, every team had to manage its own purchases, whatever they might be. In some cases, there were also individual adaptations. For instance, in the maintenance team of a dam, fairly isolated in the Alps, one of the maintenance technicians, who had some familiarity with the management information systems, accepted to process other technicians' transactions, because they felt they would waste much of their time trying to solve the entangled transactions of SAP, whereas it was fairly easy for him to do it on a regular basis. He

probably found some motive of pride and maybe some amusement in centralizing SAP transactions. Those local and individual styles led to some cases of "catachreses", the system being used in quite a different way from what it was planned for. It led to debates with the central team in charge of the SAP project, and at times to changes in the software basic functions.

SAP produced a brutal abductive destabilization of cross-professional relations within the company. It was traditionally a vertical company with a clear separation between functions and fairly formal coordination mechanisms. SAP imposed cross-functional process-based collaborations. For instance, the procurement transaction must be registered in the accounting system by the actor who controls the delivery and checks its conformity to requirements. If the accounting transaction is not correctly made, the accountants find variances and errors they cannot explain. Their efficiency depends upon the quality of non-accountants work. The technicians who do the transaction find it very difficult to do it correctly, at least at the beginning if they are not trained and monitored by the accountants. SAP required cross-functional collaborations in a firm which was not really prepared for that. It was an abductive shock: surprise, doubt, difficulties, necessity to re-invent the organizational story of collaborative activity.

The relationships between technicians and accountants, technicians and purchasers, accountants and suppliers, technicians and suppliers, accountants and managers, had to be completely redefined. There was a painful construction of process communities as "communities of inquiry", to solve problems which had to be solved, though those communities of inquiry had not been planned. The abductive shock of "cross-functional constraints" triggered a deep rebuilding of collaborative activity and organizations.

Conclusion

We saw that instruments are combinations of artefacts and individual/local/organizational habits of utilization, which are interpretive schemes. Instruments impose a "genus" of collaborative activity but leave space for individual and local stylistic creation in their utilization. Stylistic creation gradually or suddenly modifies the generic usage and the dominant interpretive habits.

As any sign, instruments frame interpretation: they give access to registers of potential interpretations and actions, they exclude other registers. They have a double function of coherence generation (by excluding and channelling) and plastic adaptation to local or temporary specificities. They are "boundary objects", like languages.

Due to their semiotic nature of signs, instruments must be interpreted; they do not carry properly "embedded" meanings. Their production is not a simple conversion of tacit to explicit pre-existing interpretation schemes. The "explicit" artefact is always associated with some interpretive habit and what is described as "making explicit is rather the production of some new artefact which dynamically transforms activity and thought.

The interpretive use of instruments, particularly when producing or receiving stylistic innovation, involves emotion, resistance, enthusiasm, surprise, fears.

This approach of instruments opens the way to two types of research about organizational dynamics:

- critical research, to deconstruct representation-based theories about organizations and artificial sciences, and to show the limits in their implementation domains such as knowledge management, decision modelling, performance measurement,
- empirical research, to analyze and understand the issues linked with important instrumental changes such as the introduction of the new international accounting standards (IFRS), the implementation of ERP integrated management systems in many companies, the implementation of multidimensional scorecards in companies traditionally dominated by financial measurements, or the role of instruments in the control of risk and accident in dangerous activities.

In any case, the semiotic point of view adopted here imposes research guidelines to ensure the relevance of observations and theoretical proposals:

- research cannot be achieved from outside, on the basis of the formal and official definition of instruments: it has to be based upon the reflexive inquiry of collaborative activities, achieved by the actors themselves, in the frame of communities of inquiry to which the researcher brings the support of concepts and methodology;
- the configuration of communities of inquiry is a key issue in research design: it should be derived from the sensemaking orientations of the organization, and therefore from strategic issues: what are the problems raised by the sensemaking options in the collaborative activity, what are the corresponding options in the delimitation of collaborative activity and community of inquiry?

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Endnotes

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[2] This ratio divides expenses related with support activities (quality, logistics, engineering, maintenance) by direct production expenses.

[3] A "*habit*" differs from a "*routine*", insofar as it is defined, not as an actual and stabilized way to act, but rather as a "mental predisposition" to act in a certain way when recognizing a certain type of situation. The actual action results from the ongoing and situated interpretation of new experience.

[4] Abduction is defined by Peirce as the only type of logical inference which allows to create new knowledge. Abduction builds new hypotheses: "the surprising fact C is observed, but if A were true, C would be a matter of course; hence, there is a reason to suspect that A is true." [Peirce]. Whereas induction and deduction are moves from particular to general and from general to particular without changing the sensemaking story of the situation, abduction rebuilds the basic sensemaking pattern.

[5] We use the term "community of inquiry" rather than "community of practice", which would point to a common practice, some common activity. The "community of inquiry" points to the fact that the actors involved in a collaborative activity can have very different practices, due to the division of labour, but jointly make sense of their activity, through their heterogeneous cooperation. For instance, the architect, the engineering team, the contractor, cooperate to make a house: they have very different practices, but the social motive of their activity concerns their global collaboration.

Against the tyranny of PowerPoint: new avenues for passionate learning?

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One of the technologies that have established themselves in our lives as academics and as teachers is the PowerPoint presentation. Like e-mail about ten years earlier, PowerPoint initially deceived by creating the appearance of accomplishing what earlier technologies did (overhead transparencies, chalk and blackboard) only more efficiently, more stylishly. Yet, just as e-mail redefined the nature of organizational communication, PowerPoint has had far-reaching consequences on classroom (as well as boardroom) presentations, making itself the indispensable medium for a wide range of applications. Within postgraduate business education, PowerPoint is now a sine-qua-non of a lecture. Correspondingly, the nature of 'the lecture' and possibly of 'learning' itself has been irreversibly altered, some indeed may say 'reinvented'. Outside academic establishments, PowerPoint has become the undisputed medium of business presentations and, increasingly, reports. This paper examines whether the increasing hegemony of PowerPoint is allowing room for discovery learning, if indeed it is compatible with a thirst for knowledge that goes beyond a mere instrumental approach to learning and understanding.

The rapid incursion of PowerPoint in education can be viewed as symptomatic of long-term changes in teaching and learning technologies. These coincide with a changing range of skills of teachers and increasingly consumerist attitudes of many learners. At its worst, PowerPoint can be viewed as part of the deskilling of teachers and the dumbing down of students. Teachers, under great time pressures to deliver on research and administration, under constant email bombardment, and faced with endless deadlines and obligations, rationalize and simplify their teaching by becoming commentators on slide shows, often considerately provided by the publishers and authors of textbooks. To caricature it a bit, teachers become slide jockeys on auto-pilot, not a million miles removed from the Fordist model. To their delight, they discover that their teaching scores and customer satisfaction improve with the use of PowerPoint. Students, for their part, become comfortable passive learners, engaging in one of the favourite pass-times of our age, watching pictures and absorbing largely subliminal messages. As consumers of educational packages, they extend their experience of being consumers of shows and spectacles, on a and off TV. This can all be seen as part of the widely debated commercialization of higher education which turns students into customers and universities into McUniversities. Education becomes a form of entertainment (some call it 'infotainment') with bite-size morsels of information that do not strain or test their powers of reasoning or comprehension beyond supplying enough material for some largely ritual testing to take place.

In the last couple of years, a lively debate has grown around the use of PowerPoint in education as well as in business. This debate (mostly conducted on web-sites) was prompted by a stinging critique by Edward Tufte, a Yale professor of information design (Tufte, 2003a, c), who charged PowerPoint with degrading the quality of communication, stupefying and boring audiences, debasing everything it touches. Critics have held PowerPoint responsible not only for spiritual and cognitive debasement but for material disasters too (Felder & Brent, 2005). Tufte(2003b), for instance, argued that the Columbia disaster might have been averted

had the crucial information regarding the foam which critically damaged the shuttle's tiles not been contained in a confusing PowerPoint slide with 10 bullet points at six levels. Tufte's argument is that the vital piece of information that would have alerted NASA to the damage sustained by the shuttle was drowned by noise and absence of context which were the result of a PowerPoint mindset.

Tufte's lampooning of PowerPoint ("Power corrupts, PowerPoint corrupts absolutely) has earned him some notoriety and fame. Yet, his critique has more than the whiff of a grumpy old man looking nostalgically at old times. Similar charges can after all be raised against virtually any form of information technology. Typewriters destroyed the skills of calligraphy, word-processors destroyed the skill of producing well-turned phrases, and the internet has allowed every type of uncensored and unauthorized text to claim an audience.

PowerPoint has its defenders too who point out that many of the shortcomings of PowerPoint result from poor usage rather than the technology itself and claim that one cannot blame PowerPoint for every problem of our educational systems (Abernathy, 1999) (Griffin, 2003). Some educationists have produced evidence from schools indicating that PowerPoint helps students absorb information and that it enhances their concentration and motivation to learn (Bartsch & Cobern, 2003; Boylan, 2004; Doumont, 2005; Hu, Clark, & Ma, 2003; Susskind, 2005). Such defenses are essentially utilitarian – PowerPoint, may not excite the students or stimulate their thirst for knowledge, but it makes the job of teachers in the classroom easier in keeping the attention of the children, helping maintain their interest and assimilate the material. Our question is whether PowerPoint can be consistent with an approach that emphasises love for knowledge and active learning.

Our own experience of PowerPoint

One of the most obvious, yet striking, things about PowerPoint in our experience has been the precipitous increase of its use in classrooms well as in conferences. For many courses today, its use is indispensable. Yet, a mere five years ago its use in universities was fairly limited. This increase is due to both 'pull' and 'push' factors – audiences, especially students, demand it and lecturers find that it makes their lives easier. It is probably true to say that students making classroom presentations adopted it before their lecturers and that they have consistently employed more sophisticated and imaginative graphics and animations than lecturers do. Its use to students can be absolutely vital. When the system malfunctions, a great deal of anxiety is unleashed.

The second thing to say is that the competence of PowerPoint users varies widely. We all have experience of presenters going ritually through their slides, determined to exhaust their stock in spite of the exasperation and tedium of their audiences. We also have experience of presenters who dazzle us with impressive graphics, leaving us in doubt as to whether it was all froth and no argument.

If competence varies widely across users, so too do the repertoires of uses to which PowerPoint is put. Some users rely on helpful or stimulating illustrations to liven up their argument, others may use bullet points to suggest an argument's basic structure, yet others may employ slides as a kind of hyper-text offering a commentary on their oral presentation. Styles in the use of PowerPoint vary – the number of slides and the speed at which they succeed each other, the nature and extent of the animations etc. Above all, the content of the slides and its relation to the oral presentation vary, reflecting the user's style and competence and the nature of the communication. Some of the dominant types of slides are a. bullet points lists, b. visual illustrations (schematic illustrations or photographic and other images), and c. statistical data, often in pie charts or other such forms (or a combination thereof).

Lists

Lists of bullet points have been the target of much criticism (Feynman, 2001). Lists imply certain assumptions that are not always met. For instance, many people (and most students) confronting a list will assume that it is exhaustive, that the items on it are co-equivalent (no list can be made of apples, dinosaurs and average rainfall in London) and that they are mutually exclusive (you can't have in a list Manhattan, Queens, Brooklyn and Lower East Side). In reality, few lists meet these requirements, and yet they block thinking into precisely areas of overlap or items that are absent from the list. Furthermore, lists obscure contexts and assume an unquestioned authority that conceals weaknesses in analysis, argument and structure.

Still, bad lists and bad use of lists is not necessarily a criticism of all lists. Feyerabend (1987) argued that (properly constructed) lists are 'basic ingredients of common sense' or indeed early forms of theory. Aristotle made extensive use of them and some of his well-known works amount to little more than highly detailed (and carefully constructed) lists. Lists have their uses. One of these is to help us structure our thinking, even though at times they assume the form of a dog's breakfast, i.e. a substitute for structure. Like a definition, a list would ideally assume a provisional or working quality, inviting refinement, criticism and discarding when exhausted or fatally flawed. Besides enhancing structure and representing first steps towards theorising, lists have mnemonic and aesthetic qualities too. A well-defined list, in its economy, completeness and originality, can afford much pleasure. A list that assumes a convenient acronymic quality (7 s's or whatever) installs itself easily in the memory.

Images

Image is the true blessing and maybe the curse too of PowerPoint. By projecting pictures, the presenter can transport his or her audience to distant places, replacing the orderly setting of the lecture theatre with visions of exotic lands and unusual sights. Ours is truly a society of

spectacle and PowerPoint can turn the modest, old-fashioned lecture into a real show, stimulating to the eye, entertaining and exciting. Our minds remain restlessly alert, seeking to establish the relation between son et lumiere, presented with countless instantaneous puzzles to prevent boredom from setting in. But, of course, as all of us who lecture know, image comes to the rescue of poor argument, dodgy structure and unreliable analysis. It also wrecks style, obliterating the finer nuances of language for the immediate bombardment of the senses.

While image can distract from the beauty or truth of an argument, for certain types of presentations, it is indispensable. Imagine trying to understand anatomy, geography or physics without the aid of images. In many such cases, PowerPoint does immeasurably enhance the use of drawings, graphs and posters, by offering the possibility of three dimensional graphics and infinite variation and nuance in the use of pictures.

Another type of image that features in PowerPoint presentations is the diagram – the schematic representation of material in 2x2 matrices, Venn diagrams and the like. These can relate large amounts of information in a relatively economical way, although as in the case of lists, they may conceal many of the simplifying assumptions upon which they rest. Yet, like lists, diagrams can help both structure our thinking process and simplify mind-numbing complexity into something that we can understand and relate to. Diagrams can also afford some aesthetic pleasure in conveying information economically, wittily and maybe elegantly.

Statistics

Statistics in PowerPoint often feature as graphs, pie charts and the like. These have been branded 'chartjunk' by Tufte (2003c) and admittedly they lack the rich informative detail, the precise beauty of numbers. Yet, they can reveal relative proportions in a quick manner and maybe avert some of the misunderstandings that arise from miscounting the number of zeroes at the end of numbers. As with the use of images, so too in the presentation of statistics, PowerPoint can present information in an economical, evocative and even aesthetic manner, although, of course id does not always do so. It does not seem to us that PowerPoint by itself and when properly used substantially degrades the quality of statistical information conveyed.

All in all, it seems to us that some of the criticisms leveled at PowerPoint may be missing the point. It is true that PowerPoint offers some easy solutions to problems of presentation, which may not always be the optimal solutions. It is also true that the technology encourages a certain linear form of reasoning that dislikes digression and has limited flexibility. Complex arguments can become simplified into bullet points and lists and fancy illustrations can conceal inadequate analysis or can create misleading impressions. Pictures and images can easily turn a learning process into one of entertainment. Yet, many of these limitations may be seen as deriving from incompetent use of the technology rather than the technology itself.

When skillfully used, PowerPoint confers certain advantages to teacher and learner, including a useful tool for summarizing key points with mnemonic cues and lively visual supports that can embed learning. Three important ways in which PowerPoint can enhance the

learning process involve structure, simplification and support. Where an old-fashioned lecture may have employed a drawing on a blackboard to draw the relations between certain concepts, PowerPoint offers a colour diagram; where a traditional lecture may have used an anecdote or a joke to support an argument, a PowerPoint lecture may use a picture or a graph to liven things up. Where a traditional lecturer may have turned his/her back to the audience in order to produce a more or less successful circle on a blackboard, today's lecturer can produce perfect circles, without ever sacrificing eye-contact.

Critics may argue that certain technologies by themselves create bad habits. PowerPoint can then be seen as creating linear, sequential, lazy thinking and providing a security blanket for both incompetent presenters and insecure learners. It helps the former camouflage shortcomings of analysis, thinking and critique through fancy graphics and compelling images. As a machine for packaging learning in standardised, digestible parcels, it helps the latter by confirming the view that knowledge is 'stuff'. In this way, PowerPoint makes sensical discourse far easier – it smoothes out all the dangerous possibilities of misunderstanding, miscommunication etc.

Yet, like all security blankets, PowerPoint creates anxieties of its own. Paramount among them is the question of whether the technology will function. Secondarily, whether the inexperienced or insecure instructor will be able to extemporise around a particular slide. For the student too, PowerPoint comes with the anxiety as to whether what seemed so clear and obvious during a presentation, will remain so in the cold light of day when the slides are inspected on a piece of paper unaccompanied by the re-assuring voice of the instructor. All in all then, PowerPoint, like all technologies would seem to be full of risks and certain possibilities. In line with the aim of the conference organizers, we now turn to explore creative and transgressive possibilities of using PowerPoint that stimulate a passion for learning and generate passionate knowledge.

Our starting point is that passionate learning today is not a marginal activity but assumes many different forms. Passion and emotion can be discovered in numerous activities which are driven by curiosity, including internet explorations, museum visits, some forms of tourism, personal growth, and all kinds of reading. The success of museums, like the Tate Modern or the Science Museum, testify to the passion of people of all ages for exploration and learning. While some adult education is driven by enhanced career prospects, most of us in Higher Education continue to enjoy discovery learners, students who are genuinely elated at discovering ideas from first principles, at being able to make sense of opaque earlier experiences or realizing that what appeared common-sensical and obvious may not be so obvious after all. And many students at all levels report about inspirational teachers who are able to awaken a thirst for knowledge, for learning and for discovery.

A vignette

Most lecturers have experience of PowerPoint equipment malfunctioning. On this occasion, one of the authors was facilitating a series of three presentations by PhD students in front of an audience of half a dozen of their peers. It was due to be held in a small seminar room and, as it happened, nobody had thought of ordering a laptop. A rash of activity ensued seeking to fix the problem, but the lecturer announced that this would be a fine opportunity to try out some old fashioned skills of presenting, debating and above all thinking. The result was one of the most creative, enjoyable and fecund seminars any of the participants had attended. Several of the participants reported later that they had learned more from that session that most earlier ones. Yet, when the lecturer suggested that the following week's seminar should take place without PowerPoint, he was roundly out-argued by nearly all the participants. It was good to be able to pull it off once, but students did not like the idea of performing routinely without the safety net of the machine. From the following week, we were back to PowerPoint. It made us think of making the most of technological adversity, as when a car, a television set or computer fails – we enjoy being able to acquit ourselves but would not like to do without these conveniences on which we readily become dependent.

Where does this leave PowerPoint as a part in passionate learning? Must it be consigned with the forces of reaction and performativity or can we think of ways it can enhance creativity, stimulate curiosity and awaken a thirst for learning? It seems to us that most of the adverse consequences of PowerPoint stem from its routine, comfortable and safe applications. An alternative range of uses for PowerPoint would be to introduce the unexpected in the communication creating discontinuity. Discontinuity is a crucial element in many types of learning. Its importance for stimulating curiosity cannot be overestimated. Discontinuity between knowledge and experience, between different types of sensory stimuli, between emotion and cognition, between what is known and what is desired – all of these fuel a desire to learn and to explore. Discontinuity represents a boundary that invites transgression, a journey to be made, an unknown to be experienced. It also implies an anxiety to be conquered.

How then can PowerPoint be used to create disruption in the comfortable communication? We would contend that like many other technologies, this one too may be subverted, twisted and turned to enhance discovery learning. The very predictability and linearity of PowerPoint makes it a fascinating instrument to subvert by taking a variety of risks. There are different performance risks that can be taken (e.g. risqué slides, collages, discontinuities, omissions and disruptions); there are fascinating and troubling juxtapositions of language and imagery; there are startling possibilities of irony and self-parody. In short, we feel that PowerPoint does offer some possibilities of stimulating a creative imagination, or opening up arid academic discourses to wider audiences. PowerPoint does not have to kill narratives, storytelling or creative thinking, although it often does. It can, if used in a passionate, imaginative way, become a source of creativity, imagination and discovery learning.

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Can WebLogs enable legitimate peripheral participation and boundary encounters?

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Introduction and aims

Weblogs (or the so called blogs) were born in the 1997-1998 as personal web pages containing a mixture of links, comments, personal thoughts and essays, and soon became a real phenomenon all over the Internet. Even though a blog is basically a form of web publishing, written in a journal-writing style, and predominantly personal, it can sustain collective writing, and network collaboration among community's members [Godwin-Jones, 2003].

Weblogs are potentially used in sectors such as industry, science, and education[2], covering topics: as personal life; daily activities; work, career, school, and research activities; critical discussions on current events, and opinions about politics, television, music, movies and stars, arts, entertainment, philosophy and religion, etc. [Carl, 2003]. In these last years various tools and content management solutions have been developed to manage personal weblogs, allowing users to create and manage their own blog, even if they do not know anything about web technicalities[3] [Blood, 2000]. Thus everyone may create her/his own blog, using very simple tools to manage knowledge in a completely autonomous way. It seems that weblogs became more and more popular on the web, providing effectiveness and meaningful interpersonal connections, allowing the personal and autonomous management of knowledge, permitting people to express their point of view rising in visibility, and connecting them with others who express the same opinions, or contribute to their knowledge spaces (weblog). The continuous interconnections among blogs allow people to freely exchange and share knowledge, participating in the definition of common understandings and ideas since becoming a member of the weblog community.

By observing the development of Internet usage, it is possible to argue that blogs satisfy new emerging needs such as to: sustain innovations, manage knowledge in an autonomous way, coordinate and share knowledge among bloggers, and establish and maintain a network of blogs. We can argue that the role of weblogs becomes relevant as much as distributed and embedded knowledge are taken into consideration. In this sense, the role of weblogs, as potential instrument and artifact for communities of practices, becomes relevant and it will be discussed as follows: Section 1 is devoted to describe the notion of blog and its features, Section 2 presents the fundamentals of theories we intend to commit to, in particular about communities of practices, legitimate peripheral participation, and boundary encounters. In Section 3 the way in which blogs might enable legitimate peripheral participation and boundary encounters are described, and finally Section 4 draws conclusions and sketches some future issues on related works.

Blogs and their features

Weblogs are asynchronous collaborative tools, based on web pages, which serve as an on line journal or diary, in which a mix of personal thoughts, opinions, comments, and links to interesting topics are offered. All these inputs are frequently (or daily) updated, stored, and organized in a chronological order. [Webopedia, 2004]

Some important blog features are the following:

- blogs are predominantly centred on the individual since they belong to a person (the blogger), who expresses her/his thoughts and ideas using personalized languages, words and meanings. Blogs are un-moderated, since their author has no obligation to publish, and no obligation to adopt a format she/he doesn't feel comfortable with, controlling entries, reediting, updating and deleting any of them at any time. Thus, blogs can be personalized in structure and graphics, expressing the real point of view of the owner;
- blogs are organized by date and all the posts are visualized in a reverse chronological order. In this way, bloggers can stress their last thoughts, and, at the same time, visitors can read new insights and comments just looking at the first page of the blog;
- blogs have an incremental structure based on both content and time. Any post, comment, and discussion theme has an indication of time and date, and is organized in thread or linear formats. Thread formats are composed by one main topic as the root, and a number of entries; linear formats are built by a single entry for each conversation. Bloggers contribute to the content in a sequential way, adding comments, ideas and opinions, and managing the evolution of comments threading posts by content and by date;
- blogs reflect a direct style. They are created with the aim at including and consciously expressing emotions, feelings, and very personal thoughts, in a very unendorsed way. In this sense, blogs contain mostly questions, thoughts, non formalized notes, all written in a very liberal language (or slang) which express the blogger's point of view, and promote the development of knowledge;
- blogs are focused on crucial content, they usually attempt to solve doubts and to look for confrontation so they tend to unveil very critical issues, or at least content that people consider very relevant in a specific moment of their life and their occupation.
- blogs are open windows to the world wide web, through which people show their own personal ideas and perspectives. The common structure of blogs (a series of comments and posts ordered by date) allows an easy exploration and comparison of meanings as in a distributed content management system. In particular readers can use RSS based systems (RDF Site Summary, Rich Site Summary or Really Simple Syndication) to find, read, collect, merge and compare contents managed by different weblogs [Roncaglia, 2003].

As it has been depicted from these main characteristics, blogs allow people to manage knowledge from their point of view, allowing knowledge exchange in a network of blogs.

According to theories as network theory [Creech and Willard, 2001; Hildreth and Kimble, 2004; Cross and Parker, 2004], collaborative problem solving [Nelson, 1999], open learning environments [Hannafin, Land and Oliver, 1999], and constructivist learning environments [Jonassen, 1999], blogs constitute an online environment, a supportive social and virtual context in which individuals can freely interact to solve problems as they engage in their groups. The heterogeneity in posts, ideas, problems, and points of views, promotes the development of multiple observations, and enables the encounter of different perspectives, sustaining innovation.

Finally, the network of relationships, the local knowledge developed within a blog or a community of blogs, the inner motivation that drives people to share knowledge, and the knowledge they produce, lead to the creation of an environment sustaining variety and rich in creativity.

Knowledge behind Blogs

Looking at weblogs features, it is possible to say that a distinct notion of knowledge clearly emerges. The absolute concept of knowledge which refers to an ideal objective picture of the world leaves the place to a notion of "local knowledge". This one refers to the personal interpretations of domains that are generated by individuals and groups (e.g. communities) through meaning negotiation processes. In other words, the nature of knowledge creation should be described as the subjective result of a distributed process, in which individual meanings derive from subjective interpretations, since they occur according to some "internal" interpretation schema, not directly accessible to other individuals. Even if, meaning remains connected only at an individual level[4] [Weick, 1993], it can be made partially accessible to other individuals only through language, since language is not simply a way to communicate information, but also a way of manifesting an interpretation schema. In the case of a weblog, language is constituted by both its conceptual structure (contents, subject relations, phases) and its graphical presentation (syntax and lay out), and readers can unveil sequences of ideas developed and intentionally posted on the blog. In this sense, blogs describe how individual meanings can be connected to social experiences.

As it has been previously described, blogs allow people to exhibit their point of view, to place comments and links, changing indirectly the conceptual structure and the point of view of the blogger.

Therefore, this approach leads to the fact that at a collective level, if they frequently contribute to the network of blogs, groups of people can share (or have a reciprocal view on) some part of their intrinsically subjective schemas. These sharing processes allow to:

- introduce a blogger in a community, namely let more easily a newcomer to join a specialized community;
- enable encounters of perspectives and insights among different blogs negotiating meanings among people who actively participate in different communities.

Before explaining how blogs facilitate connections and memberships, concepts of practices and community of practices we intend to commit to, are depicted in the following section.

Communities of Practice: some important processes

Communities of practice (COP) approach is based on a well-known branch of researches based on field observations that disclose the importance of social dynamics and practice-based relations in knowledge production processes [Lave and Wenger 1991; Brown and Duguid 1991; Wenger 1998].

From both constructivist and pragmatist perspectives, COP theories underline the role of subjects as knowledge constructors and the role of action in shaping social reality [Gherardi and Nicolini 1999; Engestrom 2000] focusing on contextual interactions. These are considered as fundamental processes on which social representation is posed. In other words, shared knowledge is embedded in specific human relations, situated in specific time and place, and it is constantly produced through the structuration of symbolic patterns related to collective behaviours [Blakcler 1993]. These established behaviours constitute a "practice" that denotes knowledge as a social competence. Thus, in order to enable reciprocal alignment among actors, participation and reification processes are fundamental issues [Orr, 1996; Wenger, 2000]. For that reason aseptic collective procedures are not enough to guarantee the actors alignment around a practice, but there is the need to emotively involve and motivate community members. Organizational COPs are interpreted as cultural systems through which meanings can be validated in social actions, and tradition can be transmitted by learning. [Cook and Yanow 1993]. By looking, using and understanding artefacts, newcomers can easily contribute to the social practices and become active members of the community through a process of Legitimate Peripheral Participation [Leave and Wenger, 1991]. The effectiveness of legitimate peripheral participation derives from an evolving progressive inclusion of the novice according to the following conditions:

- the newcomer is legitimated and accepted if she/he complies to the conditions required by expert members, and through participation processes can improve the status of her/his membership within the community;
- the newcomer has a limited accountability in the practice for her/his contributions. A low level of responsibility allows the newcomer to freely try new tasks improving her/his role as an acknowledgeable member in the community.

This social process of learning produces both collective knowledge and a shared identity since knowing how to interact in order to produce meaningful contents implies knowing how to behave in relation to other members' expectations [Bonifacio and Zini, 2004].

In some studies the self referential nature of competences formation and the conservative attitude of COP are disclosed as obstacles to innovation. Therefore the role of boundaries among COP and their related negotiation practices have been deeply described from different points of view [Beacky, 2003; Swan et al., 2002]. For in depth discussion sees concepts of

boundary roles and objects [Wenger, 1998] and perspective taking [Boland and Tenkasi, 1995].

In particular, the quality of boundary encounters depends on:

- the capacity to be transparent (namely to show its rule and resources), enabling actors to understand and take a different perspective.
- the frequency and durability of encounters. Actors have the possibility to mediate different schemas and to establish commitment, enabling meaning negotiations among community's perspectives [Carlile, 2004].

In other words, boundary encounters are artifacts that allow the access to different perspectives, enabling meaning negotiation and thus innovation.

How blogs fit in Communities of Practices

In this section it is described how blogs constitute an effective artefact that enables processes of both legitimate peripheral participation and boundaries encounters. In particular the open structure of blogs allows the communication processes among individuals, the creation of an open environment which supports the development of a social context, and the possibility to come across various communities on the web. Considering a network of blogs, posted ideas are continuously renegotiated and refined by bloggers, in fact each member can reedit, update, or delete any entry at any time since she/he feels comfortable with. Although no member is obliged to read, comment, trackback, or subscribe the RSS feeds, her/his contribution should be promoted by the social dimension of participation within a community.

Blogs to facilitate legitimate peripheral participation processes

By definition weblogs allow connections and relations within and across communities, through public spaces where people can freely participate. It can be considered as "a window on the world" that allows newcomers to participate in the community of interest, and at the same time a link to other community's members. Weblogs may be visited by anyone is interested in their contents, attracting persons that might potentially become members of the blog's community. Some of the common actions that a person does to become a community member are: periodically read the blog contents, look at the history of discussions trying to understand the meanings that community gives to specific topics, understand and appropriate the language and the main concepts, participate to community activities posting comments, questions and doubts, and finally manage new threads in the collective weblog. Participation is enabled by viewing the sequences of messages and discussions threads included in the blog, and even if languages and practices have been negotiated for a long time within the community and are very difficult to understand for an outsider, the newcomer can browse or extract content more easily through past entries and have a better understanding of the authors' personalities and current context. Through comments threads, the novice may

understand how contents and concepts have been developed within the community, allowing her/him to grant the right interpretation to community beliefs and behaviors. All actions previously described, legitimate the newcomer to add her/his ideas to the community blogs pushing other members to read and focus on the newcomer's ideas.

Legitimate peripheral participation processes are speeded up, if community leaders send positive remarks upon the newcomer's posts, link the novice's blog to their personal weblog, and disseminate the newcomer's ideas to other community members. In addition the low level of responsibility (limited to the management of a personal blog) reduces the risk of an early accountability in the practice.

Blogs to facilitate boundary encounters

Blogs can easily connect with others becoming effective boundary objects and allowing the creation of new ideas by deeper interactions and faster feedback loops. New ideas and information can circulate freely across the planet through referrals and trackbacks. Even if search engine technology may be a better way to obtain complete information on a given topic, weblogs and trackbacks can much better obtain quality information coming from bloggers' posts and feedbacks.

Boundary encounters are enabled by the structure of blog, which allow users to compare their mental schemas with the blogger's point of view (takes her/his perspective), unveiling unexpected ideas and useful insights. In other words, the transparency of concepts expressed in the blogs allows a good profiling and tracking of expertise, pointing out participant's identities and expressiveness.

Moreover boundary encounters are enabled by new tools such as search engine for blogs, search engine within blogs, blog metadata collectors, RSS feeds, etc. In particular search engine for RSS feeds[5], constantly monitor the world of blogs, select information (that a user considers relevant) and automatically deliver feeds directly to the users. Feeds are "pieces of information" such as text, links pictures and more just as the user finds on the web.

Finally through weblogs, members of a community can convey and negotiate their thoughts and ideas using their own words, commenting and discussing about specific topics, in a meaningful and exhaustive way, and negotiating different meanings and contents.

Conclusions

Some authors argue that weblogs are disseminating solutions that may create new knowledge communities, modify processes of knowledge exchange on the web, and alter knowledge work and practices among existing groups [Van House, 2004; Blood, 2003; Oravec, 2003]. Weblogs can be used in various situations, such as instruments for distributed knowledge management systems or artifacts for communities of practices within organizations.

In distributed knowledge management systems blogs are useful instruments that support the two main principles of Distribute Knowledge Management (DKM) approach (for in depth analysis see [Bonifacio, Bouquet, and Manzardo, 2000; Bonifacio, Bouquet, and Cuel, 2002, Cuel, Bouquet, Bonifacio, 2005]). These principles are: (i) the principle of autonomy: each blog express a high degree of autonomy in knowledge management, as it constitutes the real expression of personal points of views (through personalized contents, languages, structures, and graphics); and (ii) the principle of coordination: each blogger is enabled to exchange knowledge with other units not through the adoption of a single, common interpretation schema (this would be a violation of the first principle), but through a mechanism of projecting what other blogs know onto its own blog structure and comments (through network of comments and posts). In other words blogs sustain owners to express, in an autonomously way, their subjective knowledge, and to be sociality connected with others through links and posts across other blogs.

Within organizations, managers are trying to handle and "enable" (make reach) communities, and feed their productivities with technological instruments and managerial practices such as groupware applications, and wage and reputation incentives for members of communities [Von Krogh, Ichijo, Nonaka, 2000]. Several groupware applications, tools and telecommunication instruments with the aim of implementing and managing activities of a group of people or a community [Filippazzi, Occhini, 1993], have been used to enable participation and reification processes within communities and to support work interaction in and between organisations. The major role of collaboration technologies and groupware applications is to co-ordinate people working at a distance and to allow them to interact with distant data-sources [Andriessen, 2002], such as forums, mailing lists and newsgroups, bulletin boards, workflow systems, group calendars, collaborative writing systems, that aim at centralizing the community space on the web. These are aimed at sustaining local or distributed processes of communication, coordination, and collaboration in both a synchronous and asynchronous way [Chaffey, 1998]. For that reason blogs can be introduced within organizations as artifacts that communities use, both within networked organizations and among networks of organizations. One of the first manifestations of the existence of a community of practice may be the publication of a collective weblog (i.e. http://slashdot.org, http://www.artcodes.com/go/about/, http://okimc.org/blogs/media.php). In this scenario community members obviously should maintain their weblog, and decide on which weblog site(s) a new entry should be best posted. Through a collective blog, or a network of blogs, new ideas should indeed be conveyed, discussed and enhanced within a network of blogs, which supports community's members to decode ideas and knowledge into action-driven documents like procedures, courseware, books or proposals. In this situation new managerial instruments (such as wage incentives) should be introduced, with the aim at protecting strategic organizational knowledge, the intellectual capital of workers, and the attitude of individuals to freely share knowledge within and across organizations.

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[2] Many specialized weblogs have emerged and various communities have developed on the Internet (i.e. Art Teachers, www.livejournal.com/community/art_teachers/, Art Ed, www.livejournal.com/community/arted/, Educators, www.livejournal.com/community/educators/, Mr.C).

[3] Some of these "easy to use" applications are "Blogger" released by Pyra Labs in the 1999, "Edit this page" by Dave Winer, "Velocinews" by Jeff A. Campbell

[4] For in depth description see other studies on personal interpretation schemas such as mental spaces [Fauconnier, 1985], contexts [McCarthy, 1993; Ghidini and Giunchiglia, 2000], or mental models [Johnson-Laird, 1992].

[5] There are various search engine for RSS feeds such as: http://www.feedster.com/, http://www.blogdigger.com/, http://www.fastbuzz.com/main.jsp, http://www.bloglines.com/, etc.

Gate Keeping or Bridge Building? Cooperation, Learning and Boundary Working in a Cross Media Workplace

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Abstract

This paper is based on a case study of an organization that is changing its focus from a traditional news media to cross-media news production.

In conjunction with this change of focus, the organization has changed its physical work arrangements, its use of physical space, as well as its organizational structure. Cooperation across media, and learning to bridge between media are essential elements of this change process.

Based on observations, interviews and questionnaires, this paper will discuss a number of issues that play into this change process in particular in relation to learning and cooperation:

1. the voices of knowledge of the old singular media blending in with, and sometimes counter-acting those of cross-media
2. the roles of the newly introduced media-editors and the changed roles of the group leaders in the learning processes
3. the roles of the physical space and work arrangement in these processes;
4. the attempts to support these new cooperation processes with information technology.

Introduction

Since the mid 1970s, newspaper companies have faced dramatic challenges and changes in the production. The replacement of lead with computerized page-setup and the long-lasting labour conflicts resulting from this, e.g. in the UK and Denmark were only the beginning. New technology, changing markets and products as well as changing division of work and ways of working have been part of an ongoing transformation of the media scene ever since. At present, media companies worldwide are facing a new challenge termed cross-media production. Digitalization has opened for possibilities of convergence e.g. by producing content to different media and thereby creating synergy. This calls for new understandings of how to integrate different media work processes and a focus on devices and artefacts that could ease the planning and coordination in this new structure.

This paper presents the study of a media company in Denmark. The Media Company has changed rapidly in the past years. From a local newspaper to a cross media company with production to two newspapers, two radio stations, a TV channel, tele-text and web pages.

The paper will focus on how organizational roles and physical work arrangements may sustain or hamper the working together, especially the learning across media. In particular we shall explore the multiple conceptions of the editor-role–as gate keeper or bridge builder between management and editorial staff on the one hand, and the individual journalists on the other. And we shall explore the role of the large open-area editorial desk as mediator of cooperation, learning and boundary working.

Empirical basis and method

To explore our field of interest from different angels we have methodically based our case study on a combination of different methods. We have combined observations, interviews and questionnaires to reach a methodological triangulation of sources (Tashakkori & Teddlie 2000). By using observations as well as interviews we are able to point out discrepancies in what people say they do and what we actually see them doing. Questionnaires were used as supplements to the interviews after most interviews were carried out. They were, in contrast to what is often seen, more targeted and specific than the interviews, aiming to get a quantitative dimension to specific questions that were dealt with qualitatively in the interviews. In total we have conducted 33 interviews and 45 questionnaires.

We made observations in different departments and physical locations in the company using a combination of field notes and different counting methods like registration of activities and movements by means of elements of space syntax analysis (Steen et al. 2003). We have also made observations following key-people for a day. We have made observations in the central area of the editorial room, the Superdesk for most of 6 days including two days where we made observations from early morning to late evening, registering all the activities going on, with 5 minutes intervals. We wanted to make a registration of all activities, to record all movements inside and outside the Superdesk and to follow the working pattern during a day. During our observations we registered 93 meeting or discussions with 215 participants, 198 people working at their desk and 43 people talking on the phone. As part of our observations of the Superdesk, we have observed 19 formal meetings of the editorial staff.

The work is part of the Dekar project. Dekar explores office design to enhance knowledge sharing, cooperation and innovation. The project conducts 15 comparative studies of knowledge intensive workplaces (see Bjerrum & Aaløkke, 2005).

Theoretical basis

The paper views learning and change processes as boundary processes on many levels. Like Barth (1969) we are concerned with contexts and situations in which boundaries are generated. The focal point of his claim is the proposition that it is the boundary that defines the group rather than the cultural core. Organizational boundaries become visible in organizational structures and rules, and they exist as invisible patterns between individuals and different groups of people. Boundaries for example separate one work domain from another, and one profession from another, or they can be drawn between groups of people defined by shared interests in for example a particular technology (See also Bødker et al. 2003).

We combine these ideas with the change-oriented perspective of activity theory (Engeström 2001). Activity systems are fundamentally marked by dynamics, *disturbancies* or ruptures, which often are results of more profound tensions and contradictions inside the activity system (Helle, 2000). Engeström (1987) classifies contradictions within and between

activity systems as the driving forces in human learning and development. The main point is that activity is constantly developing as a result of contradictions and instability, and due to the development of new needs). Engeström (1995), Wertsch (1991) and others have combined activity theoretical analysis with Bakhtin's literary analysis using voices, to emphasize that activity systems are inherently multi-voiced; a community of multiple points of view, traditions and interests. Engeström (ibid.) uses the framework to look at how different voices of e.g. different activities (different meaning) or historical instantiations of the activity "speak" and unfold when the work is studied through observations or interviews:

> "The division of labour in an activity creates different positions for the participants, the participants carry their own diverse histories, and the activity system itself carries multiple layers and strands of history engraved in its artefacts, rules and conventions". (Engeström, 2001)

In this paper we specifically look at the dynamics of voices and boundary working in relation to learning and development in the organization.

The emerging practice of cross-media production

The transformation from newspaper to cross-media company was executed by gathering the different media types in the same building. The reporters who worked with TV, radio, tele-text and internet moved into the newspaper editorial building and the old building was restructured to meet the new demands of cross-media production.

Physically the media editors and the acting media conductor were placed in the centre of the building. The media editors are regarded as the orchestra headed by the media conductor whose role is to maintain the general view and coordinate the stories created and versioned for the different media platforms. This centre of the building is called the Superdesk. All groups of content reporters are placed thematically around the Superdesk. They deliver content for the different media platforms. Technical equipment is placed in the groups for the production of radio and television programs e.g. recording studios and editing rooms. This is done to make the versioning of stories as fast as possible.

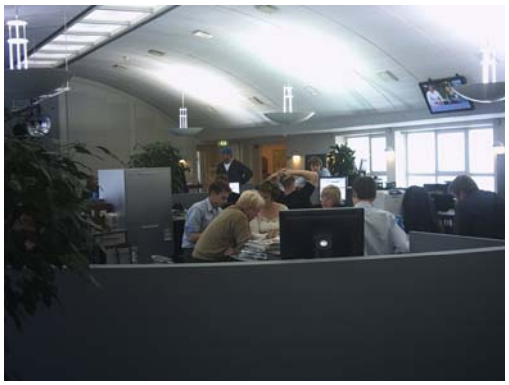

Figure 1. *The superdesk-picture*

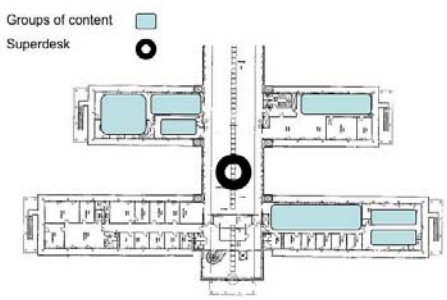

Figure 2. *The floorplan*

Three new roles were introduced in the organization: for each media, a media editor, who has the responsibility for filling the "space" of the particular media, be this the newspaper pages, or the radio news time slot. *The media editor* is characterized by the editor-in-chief as the media ego. The media editor for each media changes from day to day. Each contents group of reporters has a *group leader* who coordinates the daily work of the group and brings ideas and stories from the group to the various media, as described below. When group leaders are absent, they have a deputy to represent them. To avoid battle over resources and stories, a *media conductor role* was created. The media editors are regarded as the orchestra headed by the media conductor who maintains the general view and coordinate the stories created and versioned for the different media platforms. The chief editorial staff takes turns acting as media conductor, and the role has developed into being somebody who brings stories to the media.

The Napkin is a system designed to help the media conductor and media editors keep a general overview of the cross-media production by keeping track of the stories and versions from the different groups of content and especially local staff located outside the building. The reporters were to write planned stories and versions in the system. Seen overall, the Napkin is an instrument of coordination and of dividing work between journalists, in particular between the editorial staff and reporters. To the reporter, the Napkin is not as such a tool for, or integrated with the tools used for producing the newspaper story. It is used for reporting the plans of the reporter–which story do I (intend to) work on? When will it be finished? Which media is it intended for? The Napkin, accordingly, is intended for anticipation of the work of the reporters. As a matter of fact, it is intended that reporters write down ideas that could become stories for themselves or for others.

The company has trained the reporters in producing for the new media types and introduced editors with a record in electronic media in order to change the management from newspaper to cross-media as well. Apart from the media conductor the company has redefined the role of a group leader. These group leaders both have a responsibility towards the media conductor in delivering content and a commitment towards the group by not creating work overload. Last but not least new work schedules were introduced to cope with increased deadlines. Therefore reporters now have to share their stories and programs with different media and reporters on a different shift, a way of working which is entirely new to them.

The communication between group leaders, media editors and the media conductor primarily takes place at meetings three times per day and through the Napkin. The rhythm of the meetings in the Superdesk has been adapted first and foremost from the newspaper production–one meeting in the morning where brainstorms take place, one meeting at noon where last days news are evaluated and the media strategy is discussed and the work distributed, and lastly one meeting in the afternoon where the general view of the final media strategy is given and news for tomorrow are discussed.

The new products and boundaries

Several authors (e.g. Forsberg & Ljungberg 1998; Bellotti & Rogers 1997) describe how the media objects (as objects of work and materials turning into a product) have two sides: On the one hand the production is oriented towards informing readers about what's happening in the world with appropriate timeliness, and judgement of importance. On the other hand, it is oriented towards one or more daily products with the resources at hand, meeting internal deadlines and demands for the form of the media product. E.g. Bellotti and Rogers (ibid) point out how the chaos of the turbulent, emergent news stream is compensated for in the daily life of the media house by very strict and routinized daily meeting schedules, etc.

We are inspired by Medium Theory (Meyrowitz 1985, 1994; McLuhan 2003; Innis 1977) to further understand the complexity of the object: The theory focuses on the setting of the media or the "relatively fixed features of each means of communicating and how these features make the medium physically, psychologically and socially different from other media..." (Meyrowitz 1994: 50). Cross-media production seems complicated by each media having their own *modus vivendi* as regards timing and deadlines as well as their different potentials for telling a story:

	External	Internal
Newspaper	Background, overview and detail Mobile Slow, and unchangeable	Long research process 1 deadline per day
Radio	Rhetorics and emotions Background listening e.g. in car Ephemeral flow	Quantity and timeliness (fitting the speak to the timeslots allocated) Many deadlines
Television	Expression, immediacy, on location Focused viewing (for short time periods) Ephemeral flow	The expressing – capturing the story while it happens Several deadlines
Internet	All of the above forms Focused viewing (for very short time periods mainly in the morning) Constantly updated	Breaking news and overview summary Constant deadlines

Figure 3. *Media characteristics*

In our interviews, we asked people to identify cross-media success stories. Two recent ones were mentioned by the editor-in-chief. In one instance, a local MP announced that he would run for party chairman. The Media Company did live broadcast TV at 4 pm, supplemented by live radio feet from the TV production. On the following day, the newspaper brought background and profile. In another instance, a Supreme Court decision was

announced at Noon. The ruling was announced immediately on the Internet, followed by radio and TV, the latter showing the emotions and joy of the winning party, a group of small, local investors. Again the newspaper did follow-up and in-depth stories the next day. Summing up the use of media types in the Media Company often involves viewing the newspaper as the basis for background and follow-up information whereas TV, radio and web are used for breaking news in particular. There is an ongoing discussion on cross-media and media types and whether to save the story for the newspaper next day or to break the news on TV immediately. This is based on the argument that the newspaper subscribers should have value for their money. Consequently, exclusive stories wait for the newspaper whereas stories from bureaus break when they arise.

We also have several cases where the media cooperation runs less smoothly. One reporter talks about how, once it is clear that you plan a particular story for the newspaper, "the vultures arrive" to grab bites for the other media as well. We have seen discussions in the Superdesk between media editors and the media conductor about which media will be allowed to break a piece of news first (TV or newspaper). The latter clearly illustrates that this type of concern is related to the internal production cycle of the media: If TV breaks the news in the evening, the newspaper may have to rethink its story; and if the newspaper breaks the news the next day, TV needs to change their story so that it refers to the newspaper.

Looking at the daily rhythm of work, we may first notice that Radio starts working very early morning (4.30) and Newspaper, TV and Internet close the shop around midnight. This means that Radio finishes its first shift by the time most of the newspaper editor and staff meet. Radio work is most intense in the morning, before the joint meetings in the Superdesk begin. During the morning and early afternoon Newspaper production works slowly, while the intensity increases in the late afternoon and early evening as it becomes clear which stories make it to the front page, etc. In the evening, the informal discussions taking place in and around the Superdesk are primarily regarding the newspaper. During most of the days (including the morning meetings at 9.30 and 11) a lot of effort is put into finding the right stories for TV.

Over our many days of observation, there is a frequent discussion about finding a weekly guest. The TV editor is constantly reminding group leaders to think about stories for TV. From the observations of meetings in the Superdesk there are many complaints from the TV-editor that reporters don't "think TV"–they plan their newspaper stories and work with those. In general it seems that the TV-editor is constantly doing the job of reminding everybody that they need to think TV. In this manner there is a lot of work to be done by the TV-editors in relation to the boundaries between TV and the other media/the contents groups.

For the newspaper the main issue is determining which stories and pictures go on the front page, and most of the day there is a contingency planning of this – based on what we know now, what would be suitable? The newspaper editor early in the day scavenging e.g. picture databases for possible pictures, and she discusses with the media conductor and the photo editor which of the planned photo sessions could lead to a picture for the front page. For most

of the day these are seen as possibilities, along with the stories that are discussed in the 9.30 and 11 o'clock meetings as possible stories for the front page. The newspaper editor also spends part of her morning reading today's newspaper from both the Media Cooperation and national newspapers, and she peripherally monitors the news on national television. The whole activity seems to be about keeping the situation open for as long as possible, at the same time as possibilities gradually get established. On some days there is a pretty clear image of the main stories mid-afternoon, but many other days, the decisions are left open much longer.

Radio works four overlapping shifts from 4 o'clock to 18. In the morning they produce separate hourly local news for two radio channels, which have different target audiences and different lengths of each news piece. There is a fixed timeslot for each broadcast coordinated with national news. At 10.30 the editors meet to look ahead to the rest of the day. Mid-day is slow, shared news updates are created for both channels, and only from 16 does the newscast intensify again, with separate newscasts for two channels. In between these newscasts Radio produces longer background news for one of the channels. The radio editors characterize themselves as the "Jacks of all trades" – they have to be able to improvise, change reporters' language on the fly while reading the news out loud, change reading style between the two channels etc.

Internet and Tele-text focus on sorting in the incoming stories from bureaus and other newspapers and bringing the news immediately. The internet production is therefore a kind of watch station that is ready to go online with the news when they appear. In the meantime pictures are chosen and the different other features (e.g. picture wheel) on the website are updated. Likewise the tele-text is continuously updated. The web editor needs to coordinate with radio because it is the web editor who produces traffic reports for radio.

From our interviews and observations it is evident that a lot of what makes a success story doable across media is a matter of timing. The journalists view the idea of cross-media production in general as a positive change, but it also creates frustrations because of the increased work pressure caused by the many deadlines every day. Radio, television and internet production intervene with the more undisturbed work of the writing of articles in the afternoon. It is difficult for the reporters to keep focus and to feel that they do their work as thoroughly as expected. With their routines from newspaper production, the new pacing is frustrating. Consequently the reporters produce to the well-known newspaper first and foremost. Therefore it is very evident in our observation studies, questionnaires and interviews that the newspaper is the primary medium, TV and radio the secondary media and internet and tele-text the tertiary media whereas media such as free newspapers are satellite media. This hierarchy of media types shows that the crossing mainly concentrates on few media types and not the whole spectrum in spite of the potential relationships.

The new organizational roles & boundaries

In the following we will look more closely at the new organizational roles and on the ongoing processes where these are defined, in particular how the boundaries get drawn between the roles and the work on the boundaries contributes to the learning and cross-boundary cooperation.

The media conductor

Metaphorically, the media conductor is the conductor of an orchestra. The media conductors are all members of the chief editorial staff. The general idea behind the media conductor role was to have a managerial person present in the Superdesk to make the final decisions if the different media editors couldn't agree.

However, the role of the media conductor has evolved to being a facilitator of the process of the media production: The media conductor is seen as the anchorperson, who keeps the general overview and coordinates the activity. The media conductors emphasize different aspects of the role such as prioritizing, coaching, developing ideas, and solving problems.

When observing the media conductor throughout the day, it is interesting how much of the time is spend walking back and forth between their workstation in the Superdesk and the groups of content. This way of moving around the building is described as a crucial element of their role as media conductor:

> "The work of a media conductor involves a lot of walking. I must be sure that the groups are able to function–I must keep and eye out and notice when something happens in the groups. If they have problems. Unless you move around the building you will not notice."

By walking around the media conductor constructs an overview of the situation, coaches, spots problems and ties loose ends in the groups of content. A complication to the general problem of getting an overview is that the Napkin, which should provide the media conductor and the media editors with information on planned stories for the particular day, has not been working well, as we discuss below.

A vital part of the media conductor role is to ensure that there are sufficient stories for the different medias. At Superdesk meetings in the morning the content groups report the stories that they have planned to the conductor and media editors. These meetings also have elements of generating ideas where everybody present makes proposals for possible stories. In addition to the day-to-day operation there's a weekly meeting where ideas for the main stories for the coming weeks are discussed.

The media conductors try to direct the stories in a direction that is in line with the general values and objectives of the company – at Superdesk meetings it is often discussed how a given story can get a certain angle that corresponds with the objective of the Media Company: to make journalism that serves and entertains. The media conductor in cooperation with the media editors prioritize the different stories – which stories will be useful and entertain the users at any given day? This gives rise to a potential conflict with groups of content: The

reporters risk having their ideas turned down by the media conductor at the Superdesk meetings. However, in practice the feedback from the Superdesk is usually a request to tune the story for different media versions – not to cancel or delay the story.

One of the media conductors sees the role as that of the *facilitator and coach*, e.g. to help evolve the ideas of reporters. This is achieved by asking questions like: "which journalistic angle do you think would work for this and that media?" "Which other sources would benefit the story?" etc. The media conductor furthermore proposes his or her own ideas at the Superdesk meetings.

The role of the media conductor also involves visiting the content groups, in order to either help them to come up with ideas or *suggesting ideas*. One of the media conductors explain this part of their role this way:

> "I take a tour before the 10 o'clock editorial meeting so the groups of content don't head of in the wrong direction. It's no good coming afterwards. But if you arrive when the agenda is still open, then you may slip in a story"

The meeting in the Superdesk generally tries to evaluate yesterday's products. The media conductor summarizes this evaluation in a daily, short email summary, which is sent back to reproters. From the interviews it is clear that this type of feedback suffers from the problems well-known to the medium: The emails are brief and decontextualized, and do not provide the context necessary when the reader has not participated in the discussion herself. Hence the summary is often seen as rude, superficial and random.

The second primary element of the media conductor's role is that of *coordination*. Although the role wasn't designed for this purpose, in reality the media conductor is in charge of the coordination that ensures that all medias have enough stories. Primarily, TV is often lacking stories. This lack is discussed on the Superdesk meetings in the morning. Afterwards the media conductor usually coordinates the effort and talks to the photo editor, the group leader, the journalists involved and the TV-editor. The media conductor has the overview of the situation and continually takes the problem one step further until there are enough stories in the making for the media editor.

In this sense, the media conductor serves as the emissary of the media editors. Combined with the fact that the media editor helps generate ideas, the sight of the media editor often means more work to the journalists: A new story, a new idea that can be looked into, a different angle to a story or additional media production for a story already made for the newspaper:

> "Then the media conductor came and was desperate for features for the radio and TV."

When the media conductor isn't present because of meetings – either planned formal meetings or informal meetings related to coordinating the media production or generating ideas in the groups of content – it creates a hole in the chain of communication. This creates the need for a supplementary path of communication, which reporters and media editors are able to mend:

> "It's not so rigid. We use the newspaper editor. Not because we don't want to cooperate with the media conductor but we go to see the newspaper editor. I'm not certain where the media conductors are – if they have left for the day or where they are."

The media editors

The editor-in-chief calls the media editors "the media egos". The media editor roles (one for newspaper, one for TV one for web, one for pictures and one for radio) were deliberately created to promote and defend a particular media. A group of reporters takes turns working shifts as media editors for a particular media. They are specialized in this media and their job is to ensure that the production of given media runs smoothly.

The media editors have a deliberate role of promoting the interests of their media. This means that in some ways they work to push the borders of their media as far as they find suitable: this includes grabbing bites from other media, pushing reporters to make stories for their media, and making sure that the plans of a given day are as suitable as possible for their media.

Some of the media editors, in particular TV, are very busy for parts of the day. This means that they often don't manage to talk to the groups as part of their planning. As a result, some media need to spend the coordination meetings in the Superdesk scavenging for stories, and (as described above) the media conductor has taken on this role.

As described, the media have very different production rhythm. The planned meetings in the Superdesk support the rhythm of newspaper production whereas it does not suit radio, TV, tele-text and internet. These media have several deadlines and therefore need more but shorter brainstorm and coordinating meetings. In our observation studies of the media editors, especially the TV editor does not participate wholehearted in the meetings focusing on other media than his/her own. TV in particular has problems with the meeting before noon because the editor has a deadline at 1 pm to prepare for. This means that the participation of the TV editor can be characterized by urgency and high pace, often causing disturbance to others. The internet and tele-text editors did not participate in the meetings at all. These editors were working behind the meeting desk, overhearing the conversations.

In summary, the media editors *coordinate* the stories that go into their media. The extent to which they are active in idea generation is very dependent on the media and its *modus vivendi*. Their roles are often as *receivers of ideas* rather than initiators.

The group leaders

Each contents group of reporters has a group leader who coordinates the daily work of the group and brings ideas and stories from the group to the various media, as described below. When group leaders are absent, they have a deputy to represent them.

The purposes of the group leader role as defined by the chief editorial staff are multiple: The group leader must lead the way and show the group how to perform – the group leader must motivate and coach the reporters in the group:

> "The coaching is important. The group leader has to lead the way and yell: "Come with me!" He shouldn't yell, "You have to go that way!" The group leader has to move people."

This implicates that the group leader must help the group generate ideas for stories and make sure that the stories are produced for different medias.

The group leader is sent out as representative of the group to the Superdesk and participate in the Superdesk meetings.

The group leader has a practical role as well. E.g. the group leader is responsible for making the schedule for manning the different shifts.

Our analysis of the interviews with the group leaders show that the group leaders themselves identify three different elements that is part of the job as group leader: Coordinating, acting as the interface between the Superdesk and the journalists, and coaching.

Coordinator: The role as coordinator is to ensure that there is a match between the tasks at hand in the group, the reporters in the group and the medias.

Interface between the Superdesk and the journalists: This role is described as being the link that connects the reporters and their stories with the Superdesk with its media editors and media conductor.

Coach: The role as coach is about securing the quality of the products. It's about helping the group to generate ideas and discuss the journalism and its quality.

This being said the group leaders have very different conceptions of how these tasks should be carried out, the importance of each element, and what the higher purpose is. E.g. it is very different how often group leaders actually participate in Superdesk meetings–we have observed that some always attend, others rarely do so. Their reasons for attending or not attending ranges from general impatience with meetings, via concerns for the purpose of the meetings, to considerations regarding advantages and disadvantages of the group's visibility/invisibility at meetings.

In particular there's a difference in opinion as how to carry out the role as interface between the Superdesk and the reporters in the group:

> "I'm the coordinator. I coach the group. And I'm the interface between the group and the Superdesk to avoid the group from being distracted in their work. The reason is that the group finds contact attempts from the Superdesk disturbing. It is something that the entire group has agreed on."

> "Coaching, idea generating, planning and sticking to the plans. I'm very much the gate keeper – many want to put my people to work but I want to do that myself (in order to stick to the plans)."

This is in contrast to the following statement:

> "I have to run back and forth between the reporters and the Superdesk. E.g. if I ask a reporter if he wants to make a TV feature as well as newspaper on a given story then reporter probably says no, because he can't take it all in. Then I pass the message on to the Superdesk – that we have a story for the newspaper only. Then we discuss the possibilities of making a TV feature as well. Then I return to the reporter and tell him how it would be possible to make a TV feature. Then the reporter probably says yes because he gets the idea. I have to translate between the reporters and the Superdesk."

The group leaders conceive their role as protecting the group against tasks from the Superdesk, as preventing other people initializing tasks in the group that lies outside the goals of the group, and as being instrumental in communicating the stories of the reporters to the Superdesk.

The chief editorial staff is aware that the role as interface between the Superdesk and the journalists is potentially difficult. One member describes it in the following way:

> "A group leader must be a member of both groups – the group of content and the Superdesk. There's a conflict between the group and the rest of the house: They have to be the boogey man. It's a conflict that's inherent in the matrix organization where there are recipients and senders. The group leader must be able to say to the group after a Superdesk meeting that we are changing the idea that came from the group. So some of the group leaders find that they are in a tight corner. Some perceive the group leader as the spokesman of the group and as a safeguard against the world. Others believe that the group leader is someone who's in a nasty spot and should be felt sorry for."

It is evident from our observations that there is a difference in how the group leaders see themselves belonging to these two groups: e.g. it is very different how much the group leaders discuss internal affairs of their group in the Superdesk meetings.

Boundaries between roles

It is evident from the above that the boundaries between roles in the Superdesk have evolved from how they were conceived originally. And the dynamics on the boundaries continues to influence these roles. The media conductor is taking over from both media editors and group leaders when necessary, partly through the ways in which he moves around while coaching and brainstorming with group members.

Coordination is at the core of the meetings in the Superdesk as well as in much of the interaction between media editors, media conductor and group leaders and members throughout the day. While group leaders protect their reporters from the pull from the various meetings for stories, it is also important that the reporters know media editors well enough to collaborate without a mediator.

The physical work arrangement & boundaries

The transformation from newspaper to cross-media company was executed by gathering the different media types in the same building and by considering where people and activities should be placed in order to support the idea of cross-mediality. The office design was seen as a strategic artefact to enhance cooperation within groups, between groups and across the different medias. The company has applied an open office solution with a big hall in the middle surrounded by open group offices. The group offices are divided into different content themes e.g. society, lifestyle, culture, business and sport and in these group offices the content reporters are sitting close to their colleagues. Technical equipment is placed in the groups for the production of radio and television programs e.g. recording studios and editing rooms.

Physically the media editors and media conductor are placed in the centre of the building in the big hall. The Superdesk consists of a juxtaposition of furniture, spatial arrangement, IT workstations, multiple media displays (TV-sets, radio receivers, newspapers) within which 10-15 people work to plan and coordinate the daily production of the newspaper, the TV news-channel, two radio channels, web news and tele-text. The Superdesk consists of workstations for the media conductor and each media editors and it is the meeting place for daily coordinating meetings.

The Superdesk has many nicknames indicating different perspectives on its purpose and the people who work there:

The control room is a comment to the form, where people are seated at workstations around the periphery, but also to the locus of control of the production.

The knights of the round table is directly a comment about the Superdesk meetings, and what takes place there. In our interviews there is some amount of underlying suspicion in this term – that the Superdesk is primarily the place for people to show off (to management), not to do serious work. With reference to the Robinson Expedition this way of thinking is crystallized when people call the Superdesk meeting the *Island council*.

The circus ring mainly points to it being an area where many things happen at the same time.

The flying saucer is because of its round shape, and indeed a comment to the somewhat futuristic design.

Based on our observations, the Superdesk hosts many different activities: formal meetings, informal meetings, shouting/talking inside the Superdesk, shouting/talking with people outside the Superdesk, Superdesk workers walking out and in to and from, running, rolling on chairs, phone-calls, printing and picking up printouts, production, hand-overs, passing by and walking through, picking up papers and returning papers from table, reading (newspapers), watching television. Whenever two or more people interact with each other it is a mixture of: practical coordination (of people and equipment), development and exchange of ideas, exchange of information, evaluation of ideas and products, and private conversations

including exchange of laughs and jokes. Except for the formal meetings, most of the interactions in the Superdesk are very short.

Our analysis of the use of space in the entire building and in the Superdesk area in particular is based primarily on the two full days of observation where snapshots were made every 5 minutes of where people were placed, how they were moving, and what they were doing, in particular if and with whom they were communicating.

We see that the round table in the middle is primarily used for formal and informal meetings, coordination meetings with the media conductor, reading and fetching papers.

For shorter exchanges people may not sit down and in a lot of instances the people who work in the Superdesk will not even move towards one another, they will basically talk across the room.

For the purpose of practical coordination with others, editors and media conductor talk to people across the desk, or they invite people inside as indicated by the following observation:

Looking at what happens in the room right after the 11 o'clock meeting, in our observations we see that a reporter and two radio editors have a discussion of producing a longer radio story about a Children's Hotline. Meanwhile, at the other side of the Superdesk the media conductor catches the attention of a reporter walking through the room: "Hey I need to talk to you.." They start discussing how to make TV and radio based on a story that he is doing. This story turns out to be related to the Children's hotline, and as the TV-editor enters the space, all six people are suddenly engaged in a joint planning and coordination activity leading to media coverage for the whole day.

As regards the general coming and going, we have discussed earlier how media editors and the media conductor, in particular, visits the groups to encourage idea generation and to do practical problem solving.

We have summarized the snapshots into communication within a full hour to see how the use and extension of the Superdesk changes throughout the day. The following pattern was repeated in our observations: In the morning (10-11) there was a very large visible activity around the media conductor and television and in the evening (19 – 20) only TV, internet and the newspaper were present and the main activity was around the newspaper editor. Meetings took place at the same, scheduled time, and the key places of activity seemed to reflect the production cycle of the various media, but otherwise there was a lot of variation between the two days. Reoccurring, are two patterns*, the inward facing Superdesk*, where all occupants are busy coordinating and communicating with one another. In the particular example (Figure 6) the media conductor and the admin person leave the Superdesk to communicate with people outside, but there is mainly a lot of internal activity. Another pattern is *the outward facing Superdesk* exemplified from later the same day (Figure 7), where people are at their workstations and most communication takes place from the Superdesk, e.g. between the newspaper editor and the copy-editing staff that is located in the main hall facing the newspaper editor. Similarly the TV editor extends her focus to the end of the main hall where the TV studio is placed.

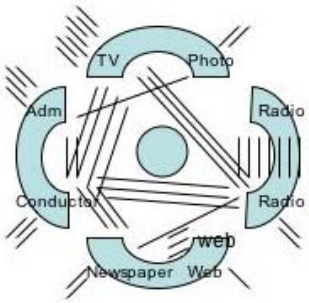

Figure 6. *the inward facing Superdesk*

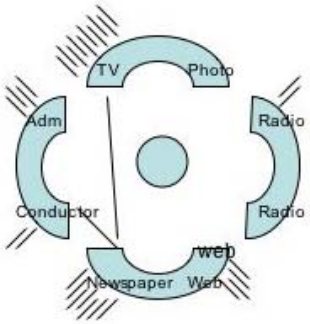

Figure 7. *the outward facing Superdesk*

Our conclusion is that the boundaries of the Superdesk are rather fluent. They are not primarily physical but recreated through the movement of people and the progress of the production process of the various media. It is like an amoeba constantly changing its shape during a day.

IT support

As seen from the perspective of the media editors and the coordinator, the Napkin is not integrated with the tools used for producing the newspaper story. The general idea is that the Napkin should provide the media conductor and the media editors with the necessary information to work out which stories should be put where on the particular day, The Napkin is used by the media conductor to get an overview of what possible stories to put into the various media on a particular day. This is mainly seen as a coordination activity where the stories that are listed "on the Napkin" are taken for granted and used as basis for deciding on media types and for working out if some stories are missing. Reporters, however, hesitate to enter stories into the Napkin because they believe that this commits them to much to their idea or proposal. In one interview, a reporter points out that:

> "If we write something into the Napkin, it is there tomorrow. It is nice to use the Napkin for your own planning, but not to submit to it (so that it becomes public). Everything in the world takes only a couple of minutes, but what do you get out at the end?"

Since the Napkin is focusing on single stories rather than e.g. the newspaper or totality of products of a particular day, and it is not really possible for the individual reporter to get an overview of how his story fits into the newspaper, TV program or into the plans of the editors, the Napkin, accordingly, has mainly been a one-way channel where reporters have informed editorial staff about their ideas.

Conclusions

In the title of our paper we asked if cooperation and boundary working in the cross-media workplace is Gate Keeping or Bridge Building?

In our analysis of the three organizational roles of the organization we point out how the media conductor has taken on the role as the emissary of the media to the groups, and as the bridge builder between the media. This was not the role intended for the media conductor. As a matter of fact he should mainly be there to settle battles over resources in the original plan. Nontheless, the way the four media conductors have shaped the role is one where they, rather than the media editors, bring the media out into the groups of contents. The Superdesk plays a role in this in the way that it is possible for them to approach reporters when they walk by. And they can coordinate with the media editors by talking across the Superdesk or by walking over. Through chairing the meetings and by walking around in the morning they seed news stories, and shape stories for several media platforms. Though intended to support this, the Napkin is insufficient because it does not give back an overview to the reporters.

The media editors are tied much more to the Superdesk. Despite the original intend for them to seek out stories as media egos, they are often too busy and tied up in coordination in the Superdesk. In the coordinating meeting it is a constant struggle for some media editors, in particular TV, to remind the group leaders that they need stories for TV. The group leaders see their roles as the emissaries of their groups to the Superdesk meetings. This is for most parts to protect the group from work overload and the ongoing push from media editors to add yet another media to the story. Through our analysis we have in many ways argued that the media editors and to some extent the group leaders do the gate keeping of this cross-media organization.

In a lot of cases, the stories get told basically because reporters and media editors know each other and cooperate directly when they find that most appropriate.

Instead of answering yes or no to our opening question we see that the Media company has more or less deliberately created a field of tension with potential for learning and cross-media creativity on the one hand and with the risk of media-copying and battle over resources on the other.

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Unleashing Passion for Knowledge
Examining Weblogs as a Communication Technology to Foster Organizational Knowledge and Learning

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Introductory Remarks

Nowadays, organizational learning and knowledge management have become omnipresent terms within the discourse of strategic management (Grant, 1996; Spender, 1996). In this context, it is widely acknowledged that knowledge has become an important strategic asset for organizations (Nonaka, 1994). Research on the knowledge-based view of the firm tries to elucidate how knowledge is managed in order to gain a sustainable competitive advantage (Bierly, 1999). Hence, managing knowledge in so-called "learning organizations" (Senge, 1990) is regarded as the ultimate goal of firms' strivings and an indispensable pre-requisite for success.

Moreover, organizations are constantly investing in IT-systems to encourage and facilitate knowledge sharing (cf. Davenport and Prusak, 1998). Nevertheless, this does not result inevitably in enhanced organizational knowledge as earlier studies have shown (Davenport, 1997). The main reason is that employees often resist sharing knowledge and information (cf. Ciborra and Patriota 1998). A second reason concerns the lack of an appropriate organizational culture (Constant et al. 1994). However, very little is known on how to overcome these barriers to managing knowledge (Raub and von Wittich, 2004; Szulanski, 1996). This is due to the fact that past research has focused primarily upon the importance and the concepts of knowledge management and organizational learning per se (Bierly et al., 2000).

In this context, *our paper aims* to examine an innovative and intriguing technology, namely *weblogs*, i.e. personalized and informal publications on the Internet. We argue that the distinct features of this novel technology might unleash passion for organizational knowledge and learning and offer the possibility to overcome traditional knowledge management barriers. Recently, weblogs were nominated as one of the "Breakthrough Ideas for 2005" in the Harvard Business Review, which proves to be the best indication for the dynamic and increasing relevance of weblogs. However, research on weblogs is still meager. Disregarding initial attempts that emanated from weblog users themselves in order to reflect about their own conduct (Hourihan, 2002), the first research reports stem from the arenas of journalism (e.g. Blood, 2000; Sullivan, 2002) and information science (Efimova, 2002). Recently, these considerations have been applied to different settings such as social network analysis (Schuster, 2004) or elaborated further in their initial arenas (Herring et al., 2005a). For most of the time, initial research primarily concerned itself with descriptive studies that tried to reveal the magnitude and applications of the weblog phenomenon. However, empirical evidence and theoretical debates remain at an initial stage (Herring et al., 2005b).

Due to the explorative nature of this paper, we chose an explorative study design. This comprised both, theoretical reflections as well as empirical evidence from a case study. Our theoretical considerations are based upon *Actor-Network Theory* (ANT), because it allows for an unbiased ("symmetrical") observation of human as well as non-human actors and

concurrently an incorporation of strong positive emotions such as passion can be accomplished (in a similar vein: Picard, 1997). The major method of data collection was based on descriptive online-research, namely *Social Network Analysis* (cf. Berkowitz, 1982; Borgatti et al., 2002). This approach has gained increased attention within the last 20 years, principally in sociology and communication science and focuses on patterns of relations among actors, such as people, organizations, states etc. (in our case weblogger). The predominant aim is to describe networks of relations as precisely as possible and trace the flow of information or other resources through them while also discovering what effects these relations and networks have on the actors. Apart from this, we conducted semi-structured interviews with IT-experts as well as users of weblogs.

The paper proceeds as follows: *Firstly*, the general features of this novel communication tool are presented and contrasted with traditional online communication devices. A novel taxonomy that enables us to distinguish between the various types of blogospheres is shown. Furthermore, our main research target, the Microsoft-Longhorn Blogosphere (MLB), is characterized. *Secondly*, we introduce a definition of passion as a basis for the integrative discussion thereinafter. Moreover, Actor-Network Theory constitutes the theoretical foundation of our paper. Referring to ANT, we discuss the emergence of passion for knowledge as well as the creation of collective knowledge in connection with MLB. The *paper concludes* with final remarks and limitations of our approach as well as an outline of implications for future research.

Setting up the Case: The Microsoft-Longhorn Blogosphere

The following section is intended to establish the foundation for the subsequent discussion of motivational and passion-related mechanisms within the theoretical framework of ANT. Thereby, it is deemed appropriate to introduce the generic features of single weblogs as well as the special case of corporate weblogs in the first instance, before we turn to blogospheres as an accumulation of numerous content-related weblogs. Apart from the interviews we conducted with Microsoft-Longhorn webloggers, we mainly drew our insights from a social network analysis that we conducted based on Microsoft-Longhorn Blogosphere.

Generic Weblog Characteristics

Jorn Barger formed the term „weblog“ on his Robot Wisdom website in 1997. The name stems from the contraction of the words “web” and “log” and epitomizes a technology belonging to the field of social software. Although there exists no consensus concerning the definition of weblogs and various subtypes have already emerged, some common features of the weblog-phenomenon can be recognized (cf. Dafermos, 2003). First, weblogs refer to a website where *individual thoughts are publicly displayed* in the *form of a log*. The site’s content is freely accessible via the Internet and no fees have to be disbursed. In most of the

cases, a *single person renders the initial content* of the site. However, it is also possible that more than one person contributes to the weblog. In addition, the probably most noteworthy feature of weblogs concerns the possibility for readers to *write accompanying commentaries* in the designated sections that often entail vibrant discussions (Herring et al., 2005a). These conversations are analogous to the discussions that can be observed in the form of threads in the field of open-source software development. A weblog is characterized by the fact that the *publications occur in a reverse chronological order and periodically*, although the frequency varies profoundly. Moreover, each post (also called entry) is time-stamped and archived so that *old content remains accessible*. The single entries are predominantly text based and usually possess a title in the form of a large header, followed by text-fragments that are connected with pictures, and, above all, often with links. This is also the point, where the blogosphere comes into play, alluding to the fact that the entire number of weblogs in the Internet represents a distinct media ecosystem. As a result, of the interlinking, there exists a multiply intertwined network of multitudinous weblogs, i.e. the blogosphere.

Following the introduction of the distinctive characteristics, one ought to *separate weblogs from related Internet phenomena* for further clarification. This is mainly done because our MLB-interviewees consistently mentioned the advantages of weblogs or blogospheres in contrast to existing online communication tools. This claim might be best underlined by the statement of a weblogger who said, "it's more open and an opinionated community that is able to share their thoughts and ideas without any hindrance. Websites have become so automated and predictable almost like zombies –, I consider blogs as websites with a warm spirit within it".

As a first indicator, in contrast to ordinary online diaries weblogs possess the ability to be augmented with hyperlinks, permalinks or trackbacks, enabling the *interlinking* via the blogosphere voluntarily. Though this is a distinctive difference in many cases, the line is unfortunately quite blurred in this respect. As opposed to personal web pages ("home pages"), weblogs are ideally more often updated. Furthermore, they are usually establishing a relationship between the individual author and the person or community that reads the content of the webpage due to recurrent posts and, vice versa, visits from the readership's point of view. Other comparable phenomena are bulletin board systems, newsgroups, and chats. These are quite similar, but usually lack the ability to be interlinked. Nevertheless, they differ consistently concerning the authority to add original content. While in the other three forms the content is created jointly (i.e. symmetrically), in the case of weblogs, the content is solely creator defined (i.e. asymmetrical; Dholakia and Zhang, 2004). As a conclusion, we assume that weblogs are not an entirely novel phenomenon. In fact, it is closely related to traditional Internet genres, above all, online diaries and bulleting board systems. However, weblogs can be asserted their own position in the broader genre ecology of the Internet (Erickson, 2000).

An explorative taxonomy of corporate weblogs

Weblogs initially mainly consisted of entries that resembled personal online diaries. However, weblogs have nowadays moved beyond self-reflective personal or journalistic disclosures to multifaceted applications within organizational settings. The following section offers taxonomy of the various emerging manifestations of the corporate weblog-phenomenon. In order to conceive the forms of appearance accurately, we deploy several dimensions. As an initial point, we deem it appropriate to identify the dimension target group, which can be subdivided into an internal as well as an external target group. Internal target group would then focus upon all employees, whereas external refers to stakeholders such as customers. In contrast, the content of the weblog constitutes a further dimension that can be subdivided into the aspects specific and general.

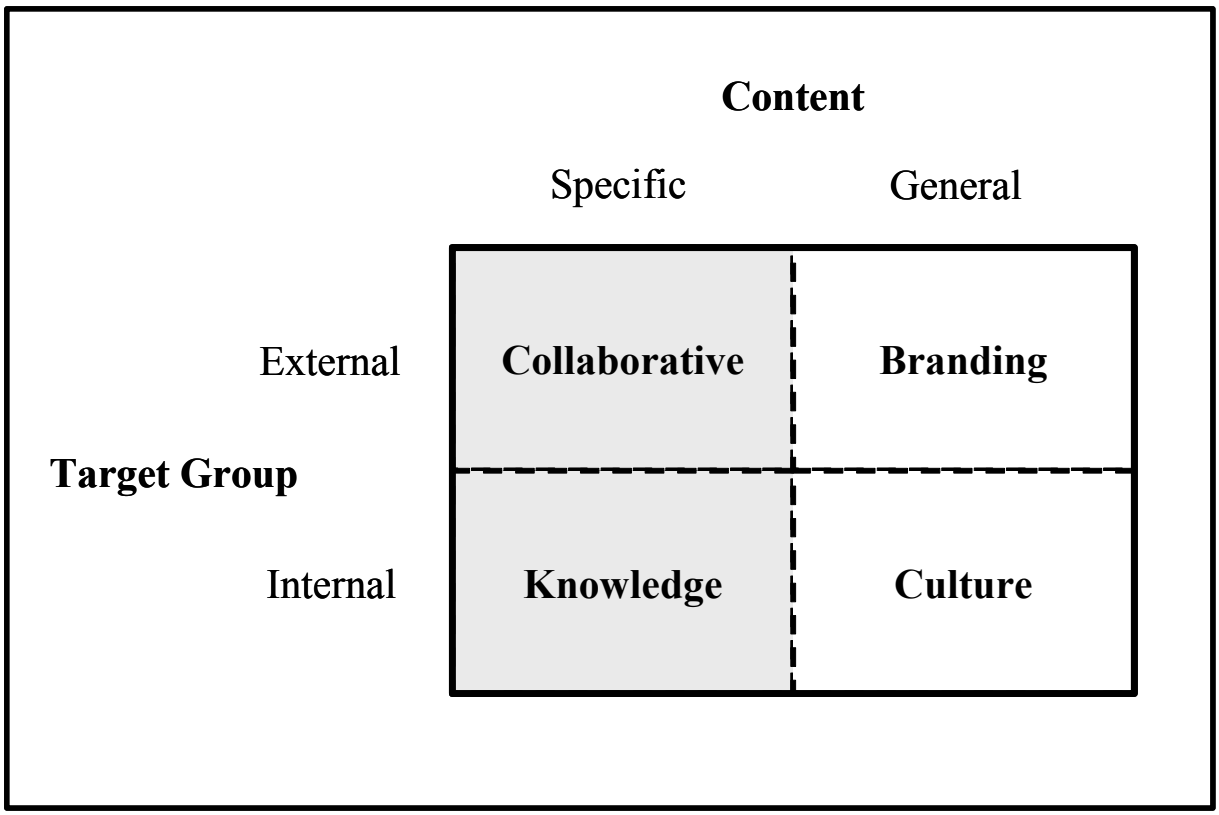

Figure 1. *Taxonomy of Company-Relevant Weblogs*

Concerning the employees as the internal target group, *culture weblogs* might proof useful to strengthen a company's culture and corporate identity. Thereby, the content is supposed to be private and informal (i.e. general). Thus, culture weblogs would incur the role of an information broker, leveraging the latest rumours or conversations similar to a notice board. In contrast to this, *knowledge weblogs* are concentrated upon the employees as well, but their content is specific. These weblogs also address a designated group of participants and facts

prevail the content of the posts. Such quasi team-oriented knowledge weblogs might also be regarded as an analogue to Communities-of-Practice (Wenger, 1998).

With regard to external target groups, stakeholder such as customers etc. can be addressed in order to strengthen the profile and reputation of the company, whereby the employees always have to expose themselves as part of the workforce of the respective corporation. Hereby, it seems striking that employees are increasingly notifying information about their experiences and progress at work publicly or in a corporate environment. This can be achieved via *branding weblogs* whose content is rather general. In this case, the individual posts of employee might reveal insider reports about everyday occurrences at work. *Collaboration weblogs* would be an alternative in so far, as their content is specific. For instance, in a corporate context this affords the opportunity of continuous one- or even many-to-many communication between employees and/or employees and customers or other stakeholders about specific tasks, services, or products. When it comes to application in reality, this is the prevalent form of weblogs in a corporate context to date.

The Microsoft-Longhorn Blogosphere

A very prominent example of a corporate weblog is the development documentation of Microsoft's new software "Microsoft-Longhorn", which will be discussed subsequently. The Microsoft-Longhorn blogosphere was mainly chosen as a research object for two reasons: Firstly, in contrast to other blogospheres within the corporate realm, the weblog-entries of the MLB are publicly accessible (cf. www.longhornblogs.com). Thus, it was possible to examine the blogosphere properly. Secondly, the MLB focuses on knowledge management and organizational learning, as webloggers are notifying information about their experiences and progress at developing and using specific software. For a start, the MLB can be depicted along two dimensions, organizational aspects, and participants.

- *Organizational aspects*: Regarding the websites that seriously and purposely deal with Microsoft-related contents, one can distinguish between websites that are either administered by Microsoft and those that are not. The MLB belongs to those that are not officially administered by Microsoft. However, Microsoft encourages its employees to engage themselves in the diverse company-related communities that have either an informative or a software-related scope. The information exchanged is restricted to the Longhorn-software. A prior test version was assigned to the MLB-members in September 2003 in the run-op to the Professional Developers Conference (PDC) in Los Angeles. The final version of Mircosoft-Longhorn is expected to be launched by the end of 2006. With regard to the PDC, the MLB was mainly active between September and October 2003. The intention was to provide potential customers, voluntary contributors, and developers a platform to air their views of the upcoming software. The weblogs are concertedly operated at the respective website www.longhornblogs.com. The various members communicate via this platform but they are also partially interlinked via their

private weblogs. Regarding the scope of the paper to examine the reasons and motivations for collaboration between company-internal and -external weblogger, we solely focus upon those weblogs that can be subsumed under the MLB. Moreover, we neglected postings by non-MLB-members likewise.

- *Participants:* The MLB consists of Microsoft employees (labeled as "experts") as well as non-Microsoft members, so called Most Valuable Professionals (MVP). According to the Microsoft's homepage, the "Microsoft Most Valuable Professional (MVP) Program recognizes and thanks outstanding members of technical communities for their community participation and willingness to help others. The program celebrates the most active community members from around the world who provide invaluable online and offline expertise that enriches the community experience and makes a difference in technical communities featuring Microsoft products" (Microsoft 2005). The MLB consisted of 60 registered members, 43 of them MVPs and 17 Microsoft employees. In turn, 36 of them were active weblogger (25 MVPs and 11 Microsoft experts). For our purpose, we labeled those MLB-members as "active weblogger" who at least once contributed to the MLB via a permalink, post or comment.

To go behind these data we conducted a social network analysis by means of the statistical software UCINET. Therefore, we initially gathered the data from the respective website. The various modes of communication (posts, comments etc. within a period from September 2003 to March 2005) were collected in an Excel-sheet by means of diverse matrices, whereby each of the 36 weblogger was assigned one column as well as one row. The relational intensity was reduced to a binary scale (one vs. zero) - i.e. the existence or non-existence of a link (sometimes also referred to as tie) between two persons was measured. Bearing this procedure in mind, each dyadic relationship could be either symmetrical (also termed reciprocal), when both parties communicated with one another, or asymmetrical when just one person contacted the respective MLB-member. Then the whole spreadsheet in UCINET was symmetrised, which implies the negligence of the peculiarities of the diverse link-types. As a result, the figure below just represents the various linkages among the MLB-members and one cannot make a distinction between the types of communication anymore.

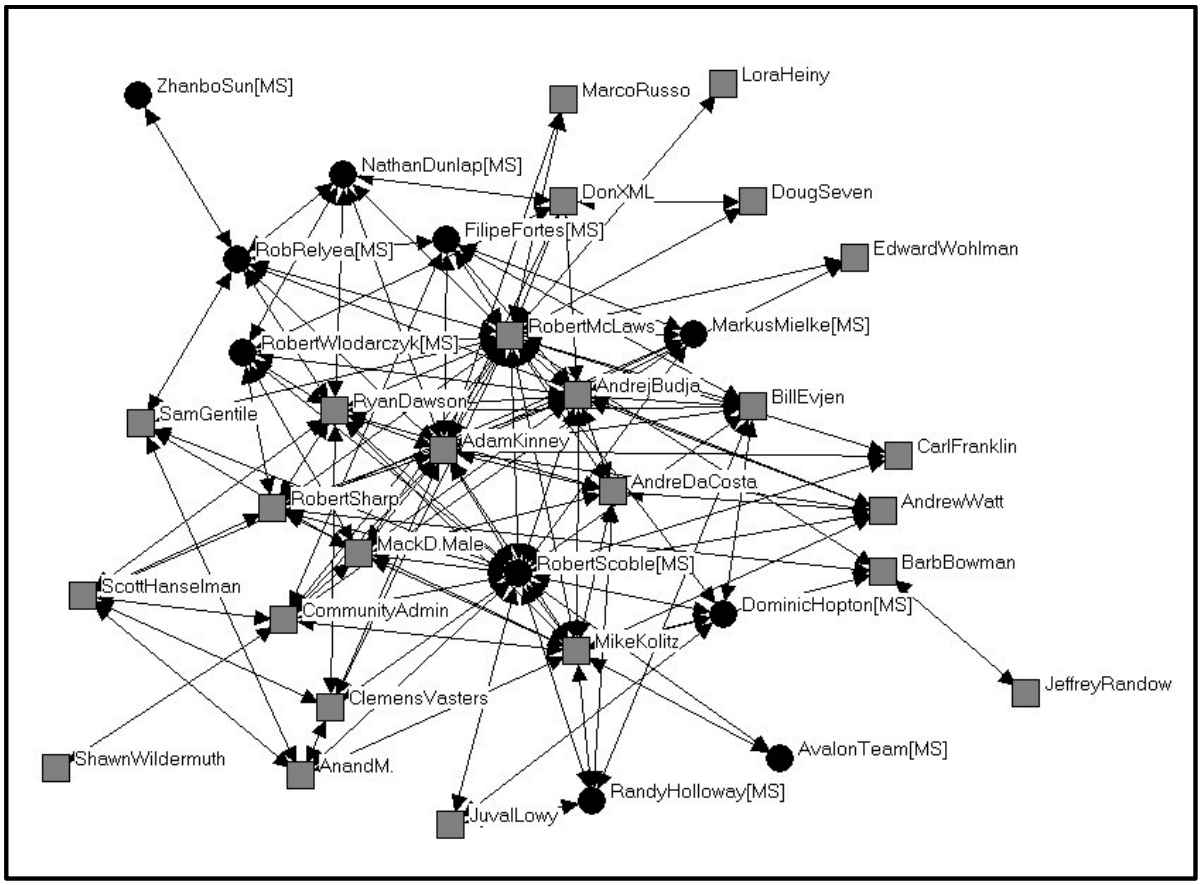

Figure 2. *Graphical representation of the Microsoft-Longhorn Blogosphere.*

In the following section, a few central results are illustrated and discussed. Social network analysts utilize a huge range of mathematical indicators. However, in this paper we constrained our research to those that are relevant for our purposes. Thus, we limited our research activities to the so-called geodesic distance, degree-based centrality, and betweenness centrality:

The measured value of *geodesic distance* refers to the length of the shortest path between two actors. At its lowest level, it could be one, indicating a direct link between two actors, but usually implies higher numbers. In our case the average geodesic distance was 2.007, indicating that each MLB-member is indirectly connected to another one on average via a single intermediary actor.

The degree-based centrality measures an actor's centrality and power potential by the number ties to other actors. Regarding the *degree-based centrality*, we calculate a centralization of the network of 54.62 %, which is considerably high. This observation can be traced back to the actors with high degrees of centrality, i.e. Robert W. McLaws, Robert Scoble, Adam Kinney, Mike Kolitz, Andrej Budja, and Ryan Dawson.

The *betweenness centrality* indicates to which extent a person connects two distinct spheres, i.e. plays a 'broker' role in the network. We observed a high betweenness centrality

(29.54 %) for those actors that were also scoring high when it comes to degree-based centrality.

Combining these two centrality measures, degree-based and betweenness centrality, one can infer from the data that the MLB inherits only a few central actors with power and influence on actors of the network. We can guess that they will work as third parties and dealmakers in exchange among others. If we additionally take into account the geodesic distance as a further indicator, we can argue that the MLB could work as a network with good information and knowledge flow.

Looking at the various weblogger, one can assert that Robert McLaws, Adam Kinney as well as Robert Scoble were the most active participants within the MLB. In this connexion it seems worth mentioning that those weblogger that contributed oftentimes were also contacted more frequently (i.e. there existed a high correlation of 0,67 between posts and comments and the score for posts and trackbacks was 0,79). To put it differently, one can assert a high degree of reciprocity here (cf. Constant et al., 1996). Thus, it seems as if webloggers that have a strong attachment to the blogosphere will be more likely to help others when they experience problems or have questions. In turn, they also received considerably more feedback in comparison to less active MLB-members. Nevertheless, the reciprocity can be depicted as a generalized reciprocity. For instance, Adam Kinney got 115 posts and 548 comments, whereby he will not expect to receive help or information from the MLB-member he helped last week, but from another network member (Barlow et al., 1995; Rheingold, 2000).

Passion for Knowledge

Passion and Emotion a neglected topic in organizational research

Although the experience of work is saturated with emotion, this aspect has received only little attention in connexion with organizational knowledge and learning (Sturdy, 2003: 82; for exceptions refer to Rice and Love, 1987 or Tanner, 2005). One explanation might be the fact that organizational scholars and practitioners frequently appear to presume that emotionality constitutes the antithesis of rationality and, thus, frequently hold a pejorative view of emotion (e.g. Thompson, 1967). However, while negative emotions have been explored more thoroughly - at least with reference to familiar and interconnected topics such as burnout or mobbing - positive emotions have been neglected to an even larger extent (Fredrickson, 2003). In contrast to this predominant trend, we argue that one has to incorporate passion as an extreme emotion to the current knowledge management discussion in order to achieve a more appropriate understanding of knowledge work. This is based on the assumption that "passion in one's work drive[s] individuals to action in ways that enhance their own self-worth as well as benefiting organization goals" (Palmer and Hardy, 2000: 279).

Passion indicates the willingness to sacrifice and can be viewed as a very strong predilection for any pursuit. From this stance, it represents an intense emotion that implies

either the extreme repulsion or extreme desire of something. Regarding the subsequent discussion, we focus upon the positive variant, i.e. passion as an extreme desire. Thus, it is argued that an organizational member is deeply committed to the acquisition and inscription of knowledge, thereby sacrificing his resource in the form of time and thoughts. As we will argue later on, the prime motivation for weblogging is the experience of flow-states that occur while reading and writing weblogs. Hence, weblogging has the potential to overcome the conventional barriers because the process of weblogging resides within the natural flow of work (McDermott, 1999). Thereby, the inclination to blog is part of a "translational process" in which the potential individual participant shall be enticed to make use of a weblog. The mechanism of translation belongs to the terminology of Actor-Network Theory, which will be set out below.

Taking up an Actor-Network Theoretical- Perspective

In order to set out our argumentation properly, we introduce the rudimentary tenets of Actor-Network Theory in two steps before the discussion concentrates upon the processes of translation and inscription. First, the emersion of ANT is delineated and, secondly, its distinctive features are described.

Because of the fact that each field of academic inquiry has often its preferred research methodology, it can be observed quite commonly that one research paradigm prevails upon another. This assertion can also be made with reference to the qualitative research traditions in the field of information systems (IS), where ANT also has to be located. Two antagonistic research positions dominate the academic dispute in IS today. On the one hand, technological determinism contends that technological changes are attributable to the innate properties of the technology at stake. Following this train of thought, the diffusion of a technology depends upon its appropriateness and ease of operation. On the other hand, social determinism is based upon the premise that IS-phenomena are embedded in the respective social context.

Bearing this traditional epistemological dualism in mind, the most central notion of ANT is the acceptance of the need for a symmetrical treatment of the various, oftentimes hybrid (e.g. human and non-human actors) entities. Thereby, it was intended to transcend the previous dualistic impasse that characterized the epistemological dualism in the qualitative research arena by means of which this socio-technological account inheres an intermediate position between the extremes of technological and social determinism (Latour, 1993).

Actor-Network Theory or the sociology of translations (Callon, 1986; Law, 1992) was developed as a sociological theory by Bruno Latour and Michael Callon who collaborated with the British scientist John Law that is also credited with inventing the term. ANT is primarily concerned with the mechanics and shifting of power in network constellations where human and non-human actors are inextricably interwoven in a process of coevolution. In this context, the researcher's attention is focused in particular upon the constitution, maintenance, and destruction of networks. Furthermore, despite its originally rather narrow

focus - i.e. to analyze the social nature of scientific experimentation and technology - it has recently gained considerable attention (Monteiro, 2000) and encompasses nowadays a vast array of topics being studied (e.g. Tuomi, 2001).

Aside from these features, the subsequent section is intended to provide a brief overview of the central terms of ANT. The term actor (or synonymously: actant) can be defined as "entities that do things" (Latour, 1992: 241), which constitutes a contrast to former definitions of actors who were commonly regarded to be social entities. Furthermore, an actor is an entity that acts on behalf of its own or shifts action while action itself is defined by a list of performances through trials (Akrich and Latour, 1992: 259).

Besides these terms and the central tenet mentioned above, the two most relevant concepts for our paper are set forth in detail below. Although these notions, translation and inscription, often constitute an interconnected system, we separate them in order to achieve an improved understanding of the motivational factors and passion eliciting mechanisms as well as the emergence of novel knowledge via inscriptions into technological artifacts. While translation deals with the process to win over and align other actors according to ones own interests, inscription is concerned with the way knowledge is embedded into technological artifacts (e.g. via posts or comments).

Elucidating the Mechanisms of Individual Passion for Knowledge as a Translational Process

Translation can be depicted as the process of negotiation whereby actors assume the authority to act and speak on behalf of other actors (Callon and Latour, 1981). In the course of this process, stability ("alignment") and social order are generated but at the same time they are permanently renegotiated and, thus, in a constant state of flux (Law, 1992: 366). This is because Actor-Networks are always open systems that are only artificially closed for inspections or analyses (Cordella and Shaikh, 2003: 4). To put it differently, by means of translation the actors deliberately attempt to influence other actors or networks according to their own intentions (Singleton and Michael, 1993: 229).

In the subsequent section, we argue that the introduction of weblogs and the MLB likewise can be viewed as a process of translation. Thereby motivational aspects as well as passion that are elicited via flow-experiences play crucial roles for the enticement of the weblogger as single actors to contribute their knowledge to the MLB. As such, the process of translation is divided into four distinctively separated sub-processes, namely problematization, interessement, enrollment, and mobilization (Callon, 1986; cf. fig. 3).

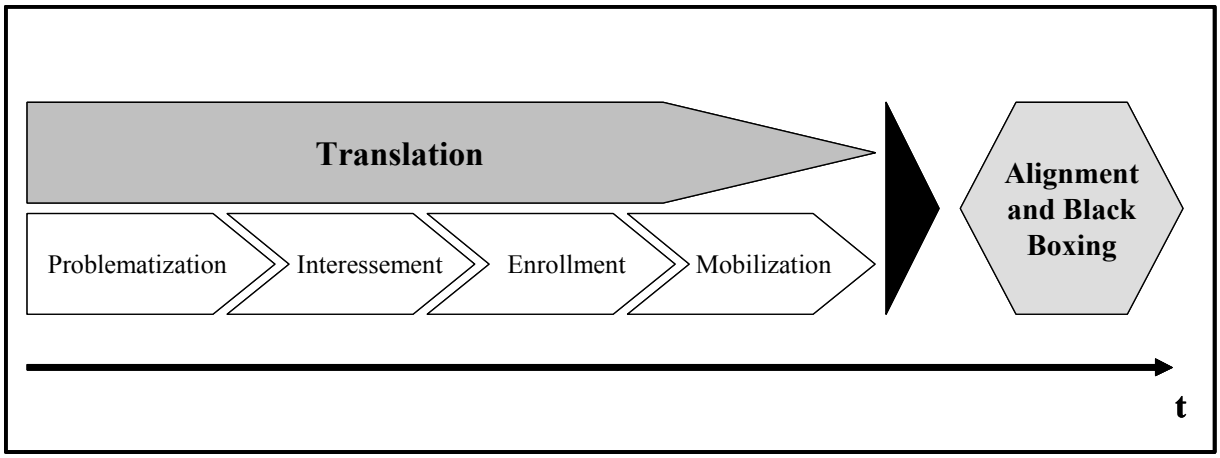

Figure 3. *The Process of Translation.*

Problematization is an initial stage in building a network and identifying its key actors. Some actors then attempted to impose their definition of a problem and their suggested solution on other actors. These initiators not only define the problems and solutions but also establish roles and identities for other actors in the network. In our case, the technological affinity and simultaneous awareness for innovative technological applications by the Microsoft (MS) employees was decisive (in a similar vein: Agarwal and Karahanna, 2000). Monitoring the Internet they identified weblogs as a chance to improve internal as well as external (i.e. via collaboration with Microsoft's MVPs) knowledge management practices. This is best illustrated and summarized by one of the comments of our MLB-interviewees who mentioned that he likes to "keep up and learn new technologies". Having defined weblogs as a useful tool for open innovation/collaboration equaled the definition of the problem and colleagues were addressed as potential and desperately needed contributors to the emerging network (i.e. the MLB). Via this stage, the initiators of the MLB established themselves as an "obligatory passage point" (Callon, 1986) for their problem solution: all the other participating weblogger accepted the claim expressed by the initiating actors that there is a need to utilize weblogs and establish a blogosphere. Despite the general acceptance, there existed initially some resistance that can be viewed as anti-programs, which try to counteract the whole process of translation (Leydesdorff, 2001). However, due to the obvious final success of the initiating actors the anti-program failed to succeed this "trial of strength" (Latour, 1988: 158).

The second stage, *interessement*, is composed of a variety of strategies and mechanisms by which initiators attempt to oblige other actors. Thus, interessement involves "actions by which an entity attempts to impose and stabilize the identity of other actors it defines through its problematization" (Callon, 1986: 207f.). Interessement includes locking new allies into the roles they propose for them by gaining their commitment to their set of goals and course of action. In order to oblige the desired actors it was necessary to motivate them properly.

However, when it comes to interessement, most existing theories rather do not seem to deliver a proper explanation for the underlying mechanisms. Thus, we draw *analogies from the open source software* (OSS) literature by which we deem to illustrate the reason why weblogger became motivated to take part in the MLB and share their knowledge likewise. Referring to OSS-projects, codified knowledge is created in the form of technological artifacts (i.e. threads) that epitomize inscriptions and carriers of knowledge (Lanzara and Morner, 2003). Bearing in mind that for participating in the projects no remuneration is offered, it is deemed appropriate to investigate respective motivational aspects that exceed the conventional understanding on how to motivate people. Due to our understanding, this might serve as an analogue to elucidate the weblog phenomenon appropriately. Regarding the motivation to disseminate one's own knowledge we borrow from Deci's (1975) duality of *intrinsic* (i.e. activities and behaviors that people naturally engage in for their own sake) and *extrinsic* (i.e. where direct compensation for the work or actions a person undertakes is expected) motivation. With regard to *intrinsic motivation*, users of weblogs oftentimes voice that they "just" enjoy it to add entries to their weblogs (Dafermos, 2003). Hence, the innate desire plays a crucial role and, as compared to controlled personal goals, this might lead to a greater possibility of goal attainment (Sheldon and Elliot, 1998). Thus, we assume that weblogger will spend a considerable amount of time and effort in order to keep their weblogs up to date while adding entries. Furthermore, altruism and prosocial behavior - as a variant of intrinsic motivation whereby a person seeks to augment the welfare of other people - might lead to further contributions (Kollock, 1999; McLure Wasko and Faraj, 2000). This assumption is best exemplified by the comment of a MLB-participant who stated that he has "important information to share with the community", or another weblogger simply voiced that "I like to divulgate". Posting an entry is in so far altruistic as it is not solely for one's own sake, but also provides potentially relevant information for co-workers and/or customers (in a similar vein: McLure Wasko and Faraj, 2000: 170).

Personal as well as future rewards can be considered as *extrinsic motivation*. Regarding personal rewards, the benefits of organizing one's own information can be subsumed (Efimova, 2003). By means of weblogs, it is possible to codify one's own tacit knowledge, thereby making the evolution of thoughts accessible. This is not only relevant for the individual weblogger but also for the company, for instance, when an employee leaves the corporation, one can still trace the genealogy of his ideas and thoughts. Apart from this personal benefit, a further external reward can be the recognition among peers. For example, while adding valuable comments to weblog entries of colleagues perpetually, the weblogger might enhance his reputation in the weblog-community as it can be correspondingly observed in the open-source community (Lerner and Tirole, 2000). In a similar vein, writing intriguing entries and commentaries can be regarded as an effective way to demonstrate personal capabilities and skills. This contention can be illustrated from the following comment of one of our interviewees who blogs because "It is how I show my expertise in upcoming technology and distinguish my name". This effect can be labeled as a novel form of self-

marketing or status signaling and might be especially relevant in a corporate context (see Lakhani and von Hippel (2003) for a related discussion in the context of open source software). Altogether, the theoretic considerations indicate, that weblog technology might overcome motivational deficits of employees regarding the usage of traditional IT infrastructure for knowledge management.

Referring to one of our interviewees, this aspect was also achieved by initiating discussions about the integration of MVPs and potential benefits to be derived from collaboration with them within the blogosphere. In this connexion, Callon noted that successful interessement "confirms (more or less completely) the validity of the problematization and the alliances it implies" (Callon, 1986: 209f.), which was in our case the formation of the MLB.

Enrollment constitutes the third stage and encompasses a set of strategies in which allies are defined and coordinated by the initiators. This is achieved by means of persuasion, power in its various forms (cf. Foucault, 1980), threat etc. For Callon, enrollment: "…designates the device by which a set of interrelated roles is defined and attributed to actors who accept them… To describe enrollment is thus to describe the group of multilateral negotiations, trials of strength and tricks that accompany the interessements and enable them to succeed" (Callon, 1986: 211). Similar to the interessement phase, motivation plays also an important role in the course of enrollment. This is termed "ideological control," which occurs by influencing actors' current evaluations of reality and instilling notions of more desirable states and how to reach them (Brunsson, 1985; Czarniawska-Joerges, 1988).

This is also the point where passion for knowledge via the concept of flow comes into play. The main reason why we chose this approach is that it aptly hooks up to the overall idea of experiencing passion for knowledge as well as learning. To the best of our knowledge it has not been yet discussed in an online setting with reference to multiple actors, only regarding single users (e.g. Chen et al., 1999; Finneran and Zhang, 2003; Pace, 2004; Pearce et al., 2005). Flow is a concept that can be credited to Csikszentmihalyi who invented the term and accompanying construct in the 1970s (Csikszentmihalyi, 1988). His main goal was to find out what elicits the pleasure that people experience when they are immersed in everyday activities and creative activities in particular (e.g. playing music or rock-climbing). Finally, he tried to understand the processes by which certain behaviors make life enjoyable. From these observations, he developed the concept of flow. According to Csikszentmihalyi (1997), flows states are autotelic (i.e. self-motivating) experiences that can sketchily be described as an intense and focused concentration whereby action and awareness are merged so that temporal awareness is distorted (Nakamura and Csikszentmihalyi, 2002: 90). The flow state is typified by the striving to achieve a goal such as writing down ones own unique work-related discoveries into a new post. Flow is achieved when there is a balance between the difficulty of the task and the particular skills of the person; in case of misfit either boredom or anxiety are the respective outcome (see fig. 4).

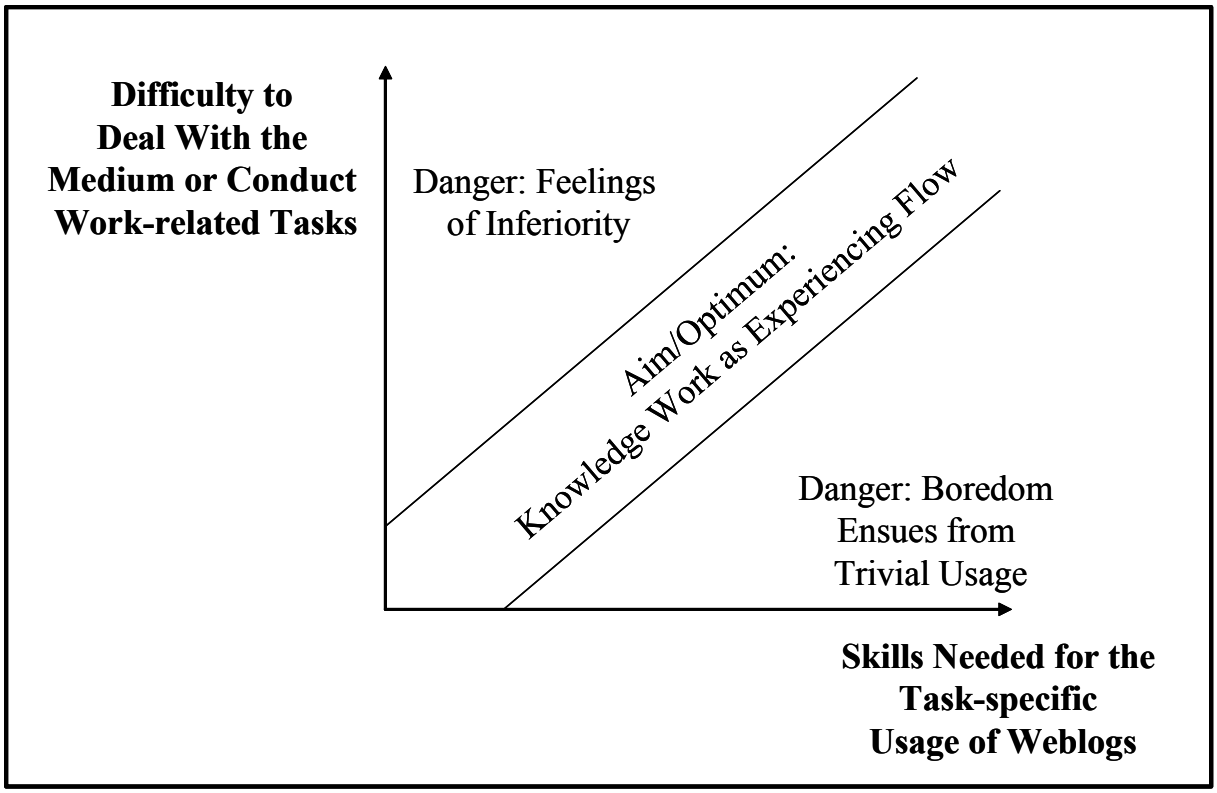

Figure 4. *Flow-Experiences in Connexion with Weblogs.*

Activities that are deemed to foster the occurrence of flow-states are those that "(1) have concrete goals with manageable rules; (2) make it possible to adjust opportunities for action to our capabilities, (3) provide clear information on how we are doing, and (4) screen out distraction and make concentration possible" (Csikszentmihalyi, 1993: xiv; in a similar vein: Goodhue and Thompson, 1995). Bearing this line of argumentation in mind, passion-eliciting flow states are likely to occur while weblogging due to the fact that the practice as such inherits all the necessary "ingredients" that are needed to experience flow and, alluding to Strati, the aesthetics of weblog-experiences is deemed to be important likewise (Strati, 2001: 9). Furthermore, the practice of weblogging as such is a recurring experience for the MLB-participants and is for them inextricably intertwined with their daily activities. As one interviewee aired, "Basically, weblogging is my way of spreading my gospel". Furthermore, we propose to extend the traditional flow-related research in connexion with online environments insofar as we integrate the challenging nature of the tasks content. According to our observations, this is a relatively neglected issue in the IS-arena while flow-examinations traditionally focus upon aspects of usability and/or functionality (cf. Rettie, 2001). Hence, assuming that weblogger tend to engage in work practices that give them the opportunity to experience flow, an increased usage of weblogs is likely, because the occurrence of positive emotions can appear throughout the entire process of writing and reading, i.e. accumulating or creating knowledge (in a similar vein Brand and Leckie, 1988: 422). As a conclusion, one can

declare plausibly that the evoking of passion enticed the weblogger to setup their own weblogs and to participate in the MLB productively. One of the main actors within the MLB answered regarding our question what the main reason for his intense weblogging is that the needs "something of interest, something I have a passion for and it's also as a result of what's going on in the community", which perspicuously underscores our claim. Hence, enrollment finally led to a consolidation of roles and activities according to the initiators' intentions.

The term *mobilization* alludes to the set of methods that initiators utilize to ensure that allied spokespersons represent their constituents properly and do not betray the initiators' innate ambitions. Alluding to Brigham and Corbett (1997), one can interpret the enrolled and mobilized actors as drilled bodies because they reliably carry out the assigned tasks according to the designated objective. In essence, this holds true for the MLB as it was initiated and effectively conducted in the run-up to the developers' conference. Insofar one can insinuate a successful translation.

With allies mobilized, an actor network achieves stability since all the focal actors are aligned. Stabilization of a technology implies that its contents are "black-boxed," i.e. institutionalized and undisputed so that a rhetorical closure arises or, as Callon and Latour put it "A black box contains that which no longer needs to be considered, those things whose contents have become a matter of indifference" (Callon and Latour, 1981: 285).[2] Referring to the MLB this implies the unquestioned, frequent, and even automatic usage of weblogs, which the initiators achieved successfully. The main issue here is the successful alignment by human (i.e. the "initiators") and non-human (i.e. the enticing flow-states, the MLB, motivational mechanisms such as the "warm spirit" etc.) actors that culminates in the joint creation and exchange of knowledge. This is based on the assumption that in the course of weblogging, knowledge is inscribed into the technological artifacts, for instance, posts or trackbacks, which will be the central topic of the subsequent section.

The Weblog-Technology as Multifaceted Macro-Actor and Artifact

In the following section we argue, that the weblog technology and the network of individual weblog entries (posts, comments, links etc.) inscribe human agency in a technological artifact. In general, the term inscription refers to the procedure whereby technical objects are treated as a program of action that coordinates a network of social roles (Hanseth and Monteiro, 1997). By inscribing these programs into a technology, the weblog technology itself becomes an actor imposing its inscribed program of action on its users.

Thus, we suggest that the utilization of weblog technology also leads to the emergence of a technological artifact as a macro-actor. In general, macro actors connect other actors and stabilize networks of connections or relations by "black boxing" them (Callon and Latour, 1981: 286; cf. preceding section). In the case of MLB, the blogosphere can be interpreted as a macro-actor, who engages in heterogeneous engineering (Law, 1992): with actors like posts, comments, individual weblogs, and individual weblogger we have different actors joined in

practice for a common objective or process, namely the development of the Longhorn Software.

However, if we argue that weblog-technology is an inscription of human agency (Latour and Wolgar, 1979; Latour, 1994; Joerges and Czarniawska, 1998; Patriotta and Lanzara, 2003), we have to bear in mind that this inscription is a *texture of different interrelated aspects and dimensions*. We can distinguish between the dimensions of *knowledge* (a), *power and governance* (b) as well as *sense-making and emotion* (c).

a) Concerning the *knowledge* dimension, the weblog technology poses as an artifact or prototype for knowledge work, as the weblog technology structures the knowledge-based activities and discourses (similar in the context of open-source software: Lanzara and Morner, 2003). The knowledge based activities and discourses in the MLB are multifaceted. Our analysis shows that weblogger engage in story telling, in reflection on own knowledge and of course in reading and commenting other weblogs etc. These activities are to be interpreted in the sense of practices of knowledge work and in a social process perspective. We guess that such knowledge work and learning can be understood as a way of being a weblogger in the blogosphere (in a similar vein: Gherardi, 1999). In this connection the blogosphere, respectively the weblog technology, acts as a transactive memory for the daily knowledge practices.

The knowledge that is "produced" and the knowledge narratives are not centrally coordinated, but locally accessible to the different weblogger. By linking individual weblogs and comments, they form groups that resemble communities rather than organizations, being supported by a network of different means of communications. The knowledge narratives lead to the co-evolution of contextual knowledge and situational knowing within the blogosphere. That is why we claim that the macro actor 'weblog technology' leads to a process of convergence, resulting in alignment and coordination among the separate entities of the blogosphere.

b) This leads us to our second notion, because we assume that the weblog-technology at least partially commenced to embody a *governing function* concerning the creation of organizational knowledge. This can be deemed as symptomatic for the novel inclination of the macro-actor weblog-technology to reframe the organization and knowledge work. Moreover, we can observe upcoming organizational routines or standardized practices of communicating knowledge. These routines can be interpreted as quasi objects that stabilize networks (Czarniawska and Hernes, 2005), such as the blogosphere. Thus, we suggest that the weblog-technology represents a novel governance model of decentralized knowledge creation, utilization and organization. No classical governance mechanisms are employed to coordinate this kind of knowledge making. Instead, the weblog technology itself "governs" as an artifact and macro-actor the production of distributed knowledge, substituting classical governance mechanisms. In addition, we can argue that the weblog technology represents a dynamic artifact (Ciborra and Lanzara, 1990) concerning content, members of a blogosphere, and structures.

Developing this argument further, we argue that the blogosphere poses as a black box, which "contains that which no longer needs to be reconsidered" (Callon and Latour, 1981: 285). Therefore, a positive and productive power can be attributed to the blogosphere and the weblog technology as macro actor (Peltonen and Tikkanen, 2005). Obviously, power has to be assessed in connection with the individual power of single weblogger. As our social network analysis suggests, there are some central knowledge broker in the MLB. The cyclist accumulation of comments and links in the MLB, i.e. the reciprocity, leads to power as a manifestation of deep structures.

c) As *social meaning and sense-making* can be inscribed into virtually any medium including formal discussions, public declarations or purely technical objects, this holds also true for the weblog-technology. Due to its inanimate nature, the blogosphere can be used as delegates for weblogger interests, authorized to "stand in" or "speak for" them (in general: Bloomfield et al., 1997). Such a sense-making starts with a specific "texture of organizing", a "collective construction of the organizational process whereby a shared understanding of organizational life is achieved" (Gherardi and Strati, 1990: 605). Regarding these issues a combination of the concept of Communities-of-Practice and ANT might enrich the discussion (Fox, 2000). The concept of Communities-of-Practice refers to the process of social learning that occurs when people who have a common interest in some subject or problem, collaborate to share ideas, find solutions, and build innovations (Lave and Wenger, 1991). Thereby, we propose that endoxa is created, a common belief among the community members (McArthur and Bruza, 2001) that additionally endorses the governance and power dimensions of the macro-actor weblog-technology.

The argument of common beliefs and endoxa itself is related to *emotional states*, that up until recently played a neglected role in IT-related discussions (Pace, 2004: 328). Emotions have been ignored or even disparaged in favor of the rational man (Strati, 2000: 13f.). Rafaeli and Vilnai-Yavetz argrue that an "exposure to organizational artifact is an "affective event" that provokes a process of affective reactions" (Rafaeli and Vilnai-Yavetz, 2004: 672). Thus, we guess that sense-making and endoxa can provoke positive emotions toward the artifact weblog-technology and the related knowledge-based activities and, henceforth, it is likely that this once again stirs the passion for knowledge up. As one interviewee stated: "Everyone cares about the same idea, in that we all want to further our understanding of things." Furthermore, these emotional inscriptions are reinforced by the establishment of knowledge-based trust (Tschannen-Moran and Hoy, 2001), as well as institution based trust (McKnight et al., 1998). While the former one alludes to trust that evolves from recurring weblog communications, the latter one aims at the integrity of the entire blogosphere as well as the competence of its members.

Concluding Thoughts

In *this paper*, we *aimed* at investigating the contribution of weblogs to the management of organizational knowledge while assuming it fosters the unleashing of knowledge in organizational settings. Our discussion showed that the feasibility of weblogs might contribute to the dissemination of knowledge in manifold ways. Regarding the individual level, we argued that the passion for knowledge could be explained and elicited via motivational issues that were derived from the field of open source software as well as the experiencing of flow-like states. On the collective level, we showed that the focal actor Microsoft-Longhorn Blogosphere had to be viewed as a multifaceted actor that was described among the dimensions of knowledge, governance mechanisms and sense-making as well as emotions, thereby supporting and unharnessing organizational knowledge likewise.

In sum, our line of argumentation was based upon *Actor-Network Theory*, which considers change as an emergent process that is initiated and conducted by actors with hormic intentions. Their agendas for change are enacted through the processes of translation and inscription in which other actors, who might oppose the new agenda, are enrolled in the effort. Via inscription, the promoters of social change achieve stability and control over the actor network. As the premises for decisions become inscribed in material artifacts, those artifacts assume the role of actors in the respective network.

Naturally, our paper and our results have several *limitations*. First, our results might be true not only for weblogs, but also for other kinds of so-called social software (e.g. wikis). Secondly, our paper is based on merely qualitative considerations. Further refinements and quantitative oriented research activities might foster our understanding of the mechanisms that foster or restrain passion. Our results confirmed our conviction that analyses that are more detailed are necessary to achieve a better understanding of the mechanisms within the blogosphere. This lack of comprehension also inspired us to extend the scope of this paper and led to an extended research project where we currently try to supplement the insights at hand via a questionnaire in another blogosphere. Finally, a more sophisticated matrix is needed in order to grasp the various types of individual weblogger (e.g. “lurker”, “contributor”, “flamer” etc.) and the target audience more appropriately. Apart from that, other company-specific blogospheres – e.g. those that are solely used by organizational members of a single company, as it is the case with Motorola – ought to be taken into consideration in order to draw rather generic conclusions. However, we hope to provide an idea and framework for empirical investigations for the phenomenon of corporate weblogs in practice.

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Endnotes

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[2] „Black box“ is a terminus that is extracted from Wiener’s treatises in cybernetics (Wiener, 1948), where it represents a piece of machinery or a set of commands that might be very complex but can also be substituted by a “box”, because it is regular and stable.

Fields for passion
Physical Space and Organizational Knowledge Creation

Anni Paalumaki and Maija Vähämäki

Introduction

The ability to build expertise and knowledge has become a crucial success factor both to societies and organizations. This has resulted in considerable amount of literature in for example knowledge building (Bereiter and Scardamalia, 1993), learning organizations and organizational learning (e.g. Vince et al., 2002), knowledge management (e.g. Schultze and Stabell, 2004) as well as in expertise and expert work (Hakkarainen et al., 2004). Compared to the knowledge needs of today's collectives the shortcomings of conceptualizing knowledge as an individual possession or focusing on activities within strictly defined expert fields have become evident. Instead, the conceptualization of knowledge as shared, distributed and contextual has gained ground. Furthermore, expertise is more often seen as the ability of collectives and networks to solve fuzzy and ambiguous problems.

The advantage of the notions of shared knowledge and distributed expertise is that they put emphasis on social interaction and on the need to cross various borders (Hernes, 2004). They stress the necessity to build both virtual and physical spaces for interaction (Castells, 1996), which enable information exchange, collective learning and knowledge building. Moreover, in this context attention has been called to heterogeneous knowledge networks of human actors and objects and other physical artifacts (e.g. Lowe, 2004).

The aim of this paper is to describe how physical space participates in organizational knowledge creating processes, how it sustains and complicates the building of knowledge. Within traditional organization studies physical space has long been a mere implicit concern. However, from 1980's several contributions within organizational culture (Berg & Kreiner, 1990; Fleming and Spicer, 2004), aesthetics (e.g. Gagliardi, 1990; 1996; Strati, 1999) or workplace studies (Baldry et al., 1998) have placed space and physical artifacts more in the forefront. The paper examines meanings of working and sharing knowledge by building on previous discussions of culture and aesthetics within organization studies (Gagliardi, 1990 and 1996; Strati, 1999).

The context

The empirical material used in the paper comes from an interpretative ethnographic study of a medium-sized Finnish family company, SOL Services Ltd. operating in a cleaning, maintenance and laundry services business (see Paalumäki, 2004). One cornerstones of SOL management's ideology is an intentional and determined way to make use of the physical work environment to influence organizational members' understanding of their position, nature of work and organizational objectives. The corporate philosophy of "creativity", "flexibility" and "empowerment" materializes in an open-plan, deskless office space (e.g. Duffy, 1997).

The company headquarters SOL City is located in a renovated film studio in Helsinki. Walls are black but otherwise bright colors are used: red, green and particularly yellow, which is company's symbol as the color of sun. There is a city theme running throughout the office space, with a street and streetlights, a marketplace, trees, building facades and fountains. A variety of locations or spaces in two floors are available for the employees to choose from. There are traditional working stations but also quiet corners with soft couches and armchairs to relax or to take important business calls. Works of art are placed around. Employees are expected to use whatever workspace is available; they can also work at home or even at their summer cottages if they like. There is an absence of organizational charts, job titles and status symbols including secretaries and company cars, own rooms and desks. These principles and the clean desk policy also include the top management.

Alongside autonomy tight, frequent and visible performance measurements are used. Responsibility and authority are decentralized to self-managed teams, who set their goals, make their own budgets, do their own hiring etc. Every month teams' performances are rated by the customers based on jointly established performance benchmarks and the results are visible to all. This has resulted in ambitious goal-setting, hard-working and open competition between teams.

In this paper we mainly use interview material of 22 SOL employees over a period of approximately five years. We admit that researching neither spatial nor aesthetic meanings is easy. Meanings are hard to elicit: hard for individuals to untangle from habitual routines of everyday life and difficult to articulate (Taylor, 2002). A key research opportunity arises when culturally established spatial configurations are challenged or explicitly are claimed to be challenged, as in this case. SOL City is presented as an alternative workspace by the management and this study is based on such an opportunity.

Passionate fields: Knowledge building in SOL City

Space has become a major concern of social theory relatively recently, due to the emergence of new forms and processes of cultural and social spaces. Physical or material and mental, social or cognitive aspects of space have been brought into discussion (see e.g. de Certeau, 1984; Lefebre, 1991; Burgin, 1996; Heiskanen & Hearn, 2004). We build on Lefebre's notion that physical, mental and social spaces are not separate, but should be seen as interrelated. Spatiality is an inherent aspect of all social life.

It became evident during the fieldwork in SOL that most interpretations of the office space were aesthetic and sensuous in nature. Knowledge building relied particularly on visual but also auditive and bodily clues. Moreover, in almost all situations different senses were interconnected to produce a sensed environment of people and objects. Thus, there are not only landscapes but also associated soundscapes, smellscapes, tastescapes and geographies of touch. With the help of sensations people start making sense of what they see, hear or feel by communicating with others. The sensations are worked on and made understandable by

relating with others (see Koivunen, 2004). However, it is worth noting that, not even interpreted through the senses, the space is not the same for everyone and always, but encompasses a whole range of different spaces; variations, paradoxes and passions.

In this paper we are asking how physical space participates in organizational knowledge creating processes. In particular, we are focusing on the aesthetic aspects of collective knowledge building by describing different sensuous aspects (the visual, the auditive and the bodily) and the opposing views or passionate forces that are connected to these aspects.

Seeing and being seen

Accounts encompassing elements of seeing and watching colleagues were typical in the research material. Many explicitly connected modes of seeing and knowledge. One could even say that office space was interpreted as the manifestation of collective knowledge.

"The good part [of the space] is that here everything goes smoothly and everyone knows everything. You can see your colleagues, who's present and you see it all, you know everything,… It is so easy to take care of things, for example, if there is something you should remember, it comes automatically to your mind when you see the person. And also, it is so easy to approach and talk to people. You see everything that is going on and it is easy to see from everyone's face that 'ok, this is not a good day for a conversation', or,' hmm, my colleague seems to be down, should I go and say something nice to her or him'." (#17)

"I think that people are not necessarily interacting so much because here we all are concentrating on our own work. But, perhaps it is the fact that we all see each other while we work. We work hard and we are enthusiastic about it." #3)

"This space and this way of working give me a feeling and a state of mind that I really and 100 % participate to the operations of this company. I see all my colleagues here, I know that they have variable salaries and that everything is completely public and commonplace here. That means that I am participating everything that is going on here and I find it very positive, it motivates me. "(#2)

Seeing and watching the space and the people in the SOL City were in general described as highly inspiring and motivating. The visual aspects of space meant not only participation and flow of explicit and tacit knowledge, but also transparency of organizational processes and thus growing trust. By looking around and watching others it is possible to be connected, to join others and verify that we are working as a group for a common target.

However, the visual was also presented in a negative way. For some SOL City wasn't a supportive and motivating but a furtive and a peeping space. Open space allows observation of others, their private duties and personal emotional reactions in secret. The gaze was ordering and objectivizing.

"There are clear cliques in the City. If you go and talk to the 'wrong ones' people stare at you." (#22)

"You know, our bosses are here around all the time, and their bosses and the whole management of the company is present, and naturally, they – or everyone, follows you, or at least that's what I think. You have the constant feeling of that you are not absolutely sure how you should behave - or should you, or should one say this or that. I'm sure that some people here have a need to show because the competition is so hard." (#20)

The open space enhanced elements of suspicion and possibilities for panoptical control instead of trust.

Hearing and listening

The auditive nature of open space allows not only hearing but also listening, sensitivity for changing situations and active orientation to other people. For SOL people listening meant abandoning hierarchies and openness to communication. In particular and literally, tolerance for multiple voices was emphasized.

"As now, there is a terrible noise coming from that direction, because people work there. If one has a problem, often people try to hide them but our way is to try to sparkle and rattle and swear, and then try to fix things together. "(#17)

Loud noise is presented here in the context of organizational identity of SOL as a unique company and a natural way to deal with problems and share knowledge. However, in many accounts noise was considered as a clear problem. Noise and loud voices or plain shouting caused irritation in many. Some had solved the problem by coming to the office during weekends or late evenings.

"What we all must learn is that when we have an office space such as this one, it is not terribly amusing if really noisy meetings are being held here. It disturbs the whole place and it can be heard outside over the phone. These are commonsense things." (#15)

"In a way, I think that this creativity stuff has made people mad so that they think that the more we have 'action' like this, the louder they shout here 'Yeah, yeah, lovely! - the freer and more creative we are. – People seem to have no manners at all; they show no consideration for others. "(#22)

We suggest that the intensive discussions in our material about shouting and loud noises and on the other hand about the irritation over this behavior are battles over territory (see Tagg, 1994; Schafer, 1977). They can be interpreted as attempts of mastering the soundscape of SOL City and controlling the socio-acoustic order in this office space where traditional symbols of status and power had been abolished. Many SOL people got irritated since the conventional view is that only the top management of the company (in addition to emergency situations and occasional announcements or warnings) is entitled to loudness. Multi-voiced knowledge creation is disturbed if there are a few dominating ways or opinions of how interaction should take place.

The bodily mode

The bodily aspects of the SOL City enable and even tempt oneself into moving around, perceiving the setting and other people from different angles, climbing upstairs and again downstairs, listening to the different sounds and looking at the finest details of the artwork, taking advantage of a wide range of facilities. This all has been taken into account in the beginning of the renovation, it was emphasized that the space should be an aesthetic hybrid adapting to and allowing different work tasks as well as emotions and feelings, challenging conventional thinking and inspiring new innovations.

It has been pointed out that especially when collective sharing knowledge or developing practical issues such as working practices "show-how" is needed (Parviainen, 2003). This involves the development of bodily knowledge by kinesthetic empathy or imitation. For example it is of great importance to show how a work task is supposed to be done properly. We find this very natural when taking the characteristics of the industry and business of SOL into account. You have to know how to scrub hospital floors, sweep grocery aisles and make hotel beds in a most efficient way and at the same time keep the customers satisfied.

In the managerial philosophy of SOL the City is dedicated to displays of happiness and positive feelings. The office is supposed to be an "oasis of delight", as expressed by the top management. Many agreed, that in order to be a proper SOL citizen you should not show negative feelings.

"It is extremely important, that if you have a bad day, you should go out and walk around the building a couple of times or something, since your bad feelings spread to others. It's each and everyone's exceptionally heavy responsibility over others' work that matters here in my opinion. This is the negative side of this kind of a space."(Managing director)

This is the official cultural, bodily norm connected to the space. By sharing the same knowledge of correct bodily expressions and emotional displays (positive or negative) you are a legitimate member of the official group or some of the countless counter-groups of SOL City.

Equivalent bodily norm is the case of yellow uniforms, which SOL employees are supposed to wear every time they meet customers. In addition they are encouraged to keep yellow clothes on while at work as often as possible. The female top manager is well known in media of her habit of always dressing in yellow. Yellow uniforms clearly construct distinctive organizational, social and professional identity: "We are from SOL, we are different from other cleaning companies, we are proud to be in cleaning business, we know how to handle tricky problems, and we are yellow!" Organizational and personal characteristics overlap and get blurred, yellowness becomes joyfulness, and persons dressed in yellow are inevitably joyful.

The introduction of yellow uniforms, suits and jackets, addresses the exclusion of the sensuous life of the individual body. Thus, the appearance and presentation of an individual, the power and the charisma, becomes an organizational rather than a personal attribute.

"The top manager uses a lot of yellow and I think that I personally use it too little. It's not that I don't like yellow; it's just that it's a color that makes some people really pale and awful-looking. When a photographer or someone is here we quickly get our yellow jackets from the rack. We joke that for your own self-preservation it's worth wearing yellow today." (#17)

Michel Foucault (1975) has described how organizational bodies are made obedient by physical exercises, discipline and training. Bodies can be controlled in workplaces by demanding monotonous movements, carrying heavy articles, working in extreme heat, cold or uncomfortable clothing. It is common that requirements are set for bodies in the workplaces of today: we should be fit, balanced, clean, in good health and in physical condition. In SOL the key issues are controlling of emotions (negative), display of others (positive). The above remarks of the yellow jackets reveal that we also often want to control our bodies by ourselves and do it as invisible and obedient.

Discussion

The starting point of the social perspective of organizational learning emphasizes interrelatedness and reflections between people in work settings. Some remarkable accounts describing the social character of organizational learning have been presented by e.g. Lave and Wenger (1991), Brown & Duguid (1991), Orr (1996), Gherardi et al. (1998) and Contu & Willmot (2003). These authors' contribution has influenced many other recent studies, and the focus of the discussion of organizational learning seems to be turning away from the managerial emphasis and towards a socio-cultural understanding of learning (Easterby-Smith & al. 1999, Abma, 2003).

The social and collective learning approaches combined with a desire of learning to develop in line with organizational goal setting is often presented as striving towards a common understanding or shared visions (Crossan et al 1999, Jacobs & Coghlan 2005). However, striving to a common understanding between co-workers might result in stability and suppressing of creative conflicts. Therefore, the notion of knowledge sharing should also include a tolerance of differences and an ability to exploit knowledge by listening also to differing opinions (a.o. Abma 2003, April 1999, Morgan 1997, Jacobs & Coghlan 2005, Vähämäki & Lähteenmäki 2005).

The striving towards multiplicity of voices in organizing calls for listening and confrontation skills from its participants. The negotiation of meanings results from the natural passion of individuals for learning and knowing. The physical space of a community acts as a trigger for relating and negotiating on collective meanings. Within the space discourses of multiple logics, even the confronting ones are created.

Above, we have described the development of organizational knowledge creation including some of the central artifacts and the complex systems of meanings and interpretations attached to them. The multiplicity of interpretations coexist in this organization, the meanings are not stable but changing and developing over situations and

time. However, very often a group of people seems to be "tuned" or connected to each other by same kind of meanings, at least momentarily. Literature about spatial proximity abounds with suggestions that sharing the same physical space provides an ideal environment for increasing interactions (both in quantitative and qualitative terms). Sharing the same aesthetic and sensuous interpretations seems to add another dimension to these effects of spatial proximity. To some extent, we suggest that proximity could be defined by the level of sharing of the aesthetic dimension or quality. That means for example, being connected to the group by the same visual or auditive cultural codes.

There is heavy evidence in previous studies that that knowledge is created through various material practices (e.g. Bereiter, 2002; Hakkarainen et. al., 2004). the space and its elements such as artifacts help to bring experts from different fields together. The material aspects might facilitate knowledge creation by combining different frames of reference and by reifying complex issues and focusing or leading conversations. Yet, plenty of issues further need our attention. What contributes to the creation of a common (aesthetic) frame of reference? What is the role of management in here, in SOL the management is very active in presenting her aesthetic imperatives. Therefore it would be interesting to complement the present case with a counter-example by taking another organization, where the space is not considered so important for the knowledge creation, even if it obviously affects the processes of knowing.

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The office as a strategic artefact for knowledge sharing?

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Abstract

In this paper we discuss if and how office design can work as an artefact for knowledge sharing. The question has arisen with the development of a new kind of office design based on the concept of "New Office" where the office design is meant to support the different activities of the employees. Office design is seen as an asset and a strategic tool rather than an expense. One of the arguments for introducing this type of office design is that it supports and increases cooperation and knowledge sharing (Bjerrum & Bødker 2002).

In this paper we will examine the relation between office design and knowledge sharing. We argue that the conception of work of the employees plays a vital role in this relation.

Introduction

What do we mean by "conception of work"? It is not a notion that has been part of an academic discussion, but it is a new recognition we have made through different case studies on office design. Conception of work is distinctively different from the idea of corporate culture (e.g. Schein 2004, Peters & Waterman 2004) that dominates the debate on how employees identify with the company (e.g. DuGay 1996, Kunda 1992, Garsten 1994). The conception of work is what you consider real work. At each workplace employees carry out a lot of different tasks everyday, but they only consider some of them as being work activities, others are disturbances or even directly obstructing the real work. So it is the "work mindset" of the employees we are exploring when talking about conception of work.

Knowledge sharing and office design

The change in workplace design towards a more activity-based office design is a way to address some of the challenges faced by the organisations:

The production has changed from a visible manual production to an invisible knowledge production creating a need for new ways of organising and managing work. To act in response to these changes and to increase their competitive position many enterprises are engaged in knowledge management trying to find ways of generating and sharing knowledge. One way to achieve this has been to make knowledge explicit and develop information technology systems such as knowledge databases and intranet that could collect, store and distribute knowledge in order to control the knowledge processes in the organisations. Many of these companies have now realised that this type of information gathering do not completely solve the problem of knowledge sharing. Intranet solutions and knowledge databases only handle the sharing of the type of knowledge that can be made explicit. However, knowledge is now also perceived as being tacit including knowledge of how to act in certain situations, manners of speaking, etc. This type of tacit knowledge can be transferred

by legitimate peripheral participation where one observes the actions of ones colleagues (Lave & Wenger 1991):

> "Learning viewed as situated activity has as its central defining characteristic a process that we call legitimate peripheral participation. By this we mean to draw the attention to the point that learners inevitably participate in communities of practitioners and that the mastery of knowledge and skill requires newcomers to move toward full participation in the sociocultural practices of a community" (Lave & Wenger 1991, 29)

It can also be transferred orally by listening in on conversations, informal meetings or telephone calls. This type of knowledge cannot be learned by reading documents, but must be learned by enacting it and by embodying it so it becomes part of ones own habitus (Bourdieu 1977). The open office is seen as a tool that will facilitate this type of knowledge sharing.

> "Rather than thinking of the office as a place primarily for solitary activity, from which one occasionally breaks out in time and space to settings intended for social activity, the office is designed primarily for social setting, from which one occasionally seeks out more private places for contemplation, concentration and confidentiality" (Becker & Sims 2001, 52)

Furthermore, the office design has changed in order to meet the organisational restructuring. To increase knowledge sharing many organisations have replaced a hierarchical structure with a more flexible structure. Work is carried out in a variety of teams demanding places to discuss and develop projects and ideas.

Finally, the change in office design is also a result of the technological developments that have expanded the possibilities as to where, when and how work can be carried out. More and more employees are now flexible and mobile in their work. The working hours spend away from the office are ever increasingly leading to a greater focus on the workplace as a meeting point.

> "The average office desk is occupied only 45 percent of the office hours – the rest of the day the worker will be in meetings, visiting clients, on holiday, training or sick." (Harrison, Wheeler & Whitehead 2004, 21)

All this has resulted in the creating of the activity-based office design, where work can take place in a variety of settings facilitating knowledge sharing, cooperation and innovation. This type of office design is being used strategically by enterprises along with technological solutions to increase knowledge sharing – office design is seen as a tool that can assist or hinder the goals and strategies of a company.

Activity-based office design

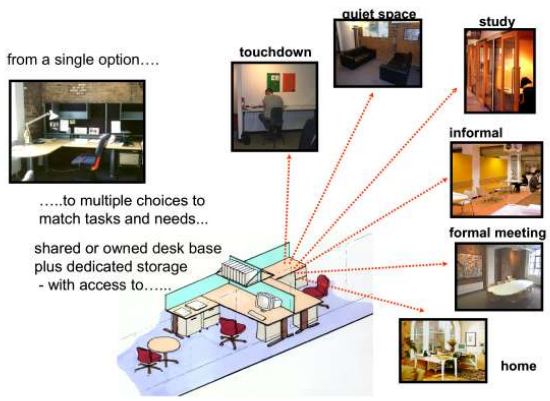
In the 1990's companies started to seek new solutions for office design in order to meet these demands for knowledge sharing and communication. The drivers for this development are mainly architects (Raymond & Cunliffe 1997, Myerson & Ross 1999) and for instance DEGW – a large architect company - provided inspiration in this process with their thoughts

on “activity-based workplace design”. This concept was used to rethink office design so focus is changed from square meters, reducing costs and increasing efficiency to the work activities and effectiveness. The philosophy behind this design is to make the most of the employees and to support them in the different types of activities constituting their work.

To achieve this the firm of architects DEGW (Duffy et al 1998) created the terms “den”, “club”, “hive”, and “cell” that mixed together would support the different activities in the company:

> **The den** is a room for teams working together on a shared project requiring a high degree of interaction. Various teams can occupy the room over a given period of time.
> **The club** is a place for informal meeting, for exchanging thoughts and ideas. It’s a place for brief interaction with people from various professions.
> **The hive** describes a large room with several persons working individually with little need for interaction.
> **The cell** consists of small offices, primarily with one or two occupants.

This way of thinking has inspired the present office design in different countries and companies and resulted in the rising of a new type of office design with a mix of open offices, lounges for informal meetings, touch down areas where visitors can read their e-mail, small rooms for concentrated work or long phone calls. In this type of office the employee can choose between the settings for the task at hand.



New Office. DEGW’s model for activity-based work.

But this is not always such an ideal solution. Not so much because of the actual office design, but mainly because of the lack of consideration in the way the new office design is implemented and used. We will take a closer look at some of the general pitfalls.

Pitt falls

There are many factors that hinder this process of transforming the office design and creating an environment that stimulates learning and knowledge sharing.

When companies decide to work strategically with developing a new physical environment to increase interaction they often focus on particular issues instead of taking a holistic approach to the change. Some of the general pitfalls are (Bjerrum & Nielsen 2003; Bjerrum & Fangel 2004):

- To focus more on aesthetics than on well-being. It seems more important that the workplace is presentable than to create an optimal environment for people to work.
- That the management initiates and sells the idea behind New Ways of Working and New Office, but they don't participate themselves.
- To think that the process ends when the company move into the new facilities and therefore not making adjustments afterwards that would increase the benefit from the new office design.
- To focus only on the physical environment in a company. The physical environment must be in order. However, discussions on the physical environment are often discussions that stem from other problems in the company. Instead of addressing and dealing with these problems, the debate has evolved around the choice of chairs and tables since talking about chairs and tables is more legitimate that criticizing the management, colleagues, office environment etc. These debates on the physical environment can go on indefinitely because they only scratch the surface and never solve the actual problems.
- Or to look upon New Office as a change agent in itself. People think: If only we get other spatial solutions it will lead to increased knowledge sharing, cooperation and teamwork.

Many of the problems mentioned here are not that difficult to solve. Most of them only require little consideration.

The DEKAR project

Dekar[1] will identify best practises by exploring how office design can be used in a strategic manner to enhance knowledge sharing, cooperation and innovation for enterprises in the Nordic countries. The project conducts 15 comparative studies of knowledge intensive workplaces. The selected companies have all worked strategically with the office design. In all the case studies the same methods are applied and in the interviews the same topics are

brought up to ensure comparability across the case studies. The case studies are carried out in different types of enterprises e.g. newspapers in two different countries, telecom in two countries, IT companies, food industry, a law firm etc. In this paper we only focus at the three Danish case studies.

A survey was also conducted in 2003 in the Dekar project by TNS Gallup among 750 leaders in Norway, Sweden, Finland, Denmark and Iceland. The survey reveals that 33% of all Nordic leaders planned to rebuild their offices within the next two years so this is really taking off.

Methodological reflections

In Denmark three case studies have been carried out over the past three years in three different companies – in a law firm, in an IT and a media company. All companies were chosen because of their strategy to implement an office design to support or increase knowledge sharing and cooperation.

In our three studies we have applied several different methods of collecting data. First of all because different methods capture different aspects of the field – interviews are helpful to gain and to understand a person's thoughts (Kvale 2004), observations and registrations are useful in order to get insight in how the individual actually acts (Schensul & LeCompte 1999). Secondly, we use the different methods because we find that there is a difference between what people say they do, and what they actually do. The use of several methods and sets of data furthermore helps secure a valid analysis and understanding of the research questions (Denzin & Lincoln 1994; Tashakkori & Teddlie 2000).

During the progress of the studies we have continuously analysed our discoveries and taken on new theories as well as new methods in order to capture and understand the findings and to pursue these findings (Wadel 2002).

Throughout the project we have focused on how people work and interact with each other – including how they share knowledge - and how they perceive the office design in this relation.

Interviews

In the all three case studies we have interviewed a major part of all the employees and the management. In the interviews we indirectly explore the conception the employees have of their work, knowledge sharing and office space and how they see these aspects play together. – With whom do they primarily corporate and where is that person located, how often do they have formal and informal meetings, what advantaged and disadvantages does the office design have and so on. We also ask them to describe their work and their previous workday. That type of open-ended questions provides us with knowledge of their conceptions of work.

Observations

We have also made observations in all the cases. Our observations are designed to capture what people actually do and to find patterns in their behaviour (Spradley 1990). It also includes our perception of the noise, to what extend people talk to each other in the open offices and how frequently informal meetings take place. We make our own impression of the workplace and experience it ourselves (Marshall & Rossman 2003).

Registrations

We have applied registrations in order to explore the working patterns of the employees. We have adapted the methods of registration appropriate to the organisation thus using three different methods in the three cases.

In the case of the IT company we have made registration of the use of facilities in the company and counted the number of people present at each desk at different times of the day over a period of 14 days. We also made registrations of the use of the facilities. We thereby determine if and to what extend the employees use the hallway and café-like settings as locations for informal meetings.

In the law firm we let the employees keep a record of their working patterns for one month – how often do they work from home, in their office, how much time is spent on meetings in and out of the office building etc.

In the media company we have made snapshots of activities on the premises. Over a period of two days we have continually made registrations of what each person was doing at a specific time: Equipped with a blue print over the building we have walked the building registering everyone present. When coming into a room we have marked each person present with a symbol of the activity that the person was engaged in. This way we achieved a detailed insight in the number present, their dominant working activity and the location of each activity.

Case studies

All put together these different methodical approaches - observations, interviews, questionnaires, and records of working patterns give a detailed understanding of the employees' thoughts at work, knowledge sharing and physical working environment as well as a profound knowledge of the actual behaviour.

This has resulted in one of the major findings in Dekar: the "conception of work". During our three cases it became evident that the use of office design to increase knowledge sharing to a large extend depends on the "conception of work". That is, the relation between office design and knowledge sharing depends on how employees conceive their work and on how they believe that work should be carried out in relation to their colleagues. We have found

that the conception of work is a crucial obstacle that the companies face in the effort to make office design support knowledge sharing.

By using a combination of the different methods we have been able to gather enough evidence to establish and challenge the conception of work amongst the employees.

Through our empirical findings we will explore this notion of "conception of work" and how it plays a vital role in the relation between knowledge sharing and office design.

1st case study – a law firm

In the autumn of 2003 we made a case study in a large Danish law firm. This law firm had a traditional office environment where all the employees had private or shared offices except for the personal assistants (PA) who where placed in an open office environment. The law firm had a strategy for increased knowledge sharing and increased openness and as a part of this strategy the firm decided to use glass instead of walls in the offices and meeting rooms. This may seem a very small change in the office design, but it was recognised as a big step and visiting other Danish law firms – we could see the difference.

In this law firm we interviewed 40 employees: partners, lawyers, trainees and PA's. We made observations and registrations of working patterns.

What did we see?

We saw a workplace where everybody walked very fast. A workplace, where most of the offices had open doors and where some were always closed. We saw a lot of short meetings in and out of offices and a lot of laughing and talking in the open space. Whenever there was a meeting in one of the partner's offices the door was always closed.

What did they say?

The general opinion in this law firm was that legal work only could be carried out in a traditional office environment. The various groups all agreed that PA's share an open office environment partly because of the design of the building, partly to strengthen the professional and social network.

The groups also agreed that partners and lawyers need to have their own office, because they have a very noisy behaviour. They speak a lot on the telephone and they dictate. At the same time they need to concentrate a lot on their legal work.

The trainees on the other hand have been placed in offices in pairs, because they are new in the company and in a learning process. And everybody agreed that the trainees would benefit a lot from sharing.

All the different groups in the law firm agreed that there were good reasons for choosing this office setting.

Having said this, there is no doubt that space is still coupled with status and tradition within the legal profession:

> "The big egos were inconsistent with small offices"

> "It is untrue if they claim that space is not coupled with status. Some will argue that they are quite indifferent about status, but there is just as much status in making a show of this kind of opinion."

What was their conception of work?

In our interview with the employees we found that their conception of work was that law work primarily equals individual work. When asked to describe their work the lawyers describe long or short cases and the organisational relations like for instance "*I'm working for*..." or "*I refer to*..." but never "*I work with*…" Nobody describe their work as collaboration with others. On the contrary they underline the individuality of their work.

Our observations and registrations, however, gave another picture of the work going on. The work processes in the law firm were much more varied than the conception of work and there were also a big variety in the working patterns for the different groups in the company:

Errore. Non si possono creare oggetti dalla modifica di codici di campo.

In the figure it is quite obvious that the higher placement in the hierarchy the bigger the spreading in work places.

So you can see a big difference in the work places related to the job title.

The partners had a huge amount of external meetings and are only spending 37% of their time in their big offices. They travel, they work from home and they have mobile work. The lawyers have almost the same working pattern except for external meetings. It is primarily the partners who are the sales persons. The trainees and the PA's are spending most of their time

in the office. The trainees have the same amount of external meetings as the lawyers but apart from that their work places resemble the personal assistants.

Even so the conception of work in the law firm was first and foremost that law work is individual, and law work is what the client pays you for. Informal meetings with your colleagues are considered either a luxury or interrupting and disturbing. Either way it is not considered real work. So if you have talked to somebody during your workday it is like you have been playing hooky from work and then you'll have to compensate by working late/overtime.

> "I talked to different people – nearly half an hour with my boss. Then you have to work late"

As a lawyer you have to be efficient. Talking to your colleagues is considered "cosy" but inefficient:

> "It is cosy to be sitting together but it's not increasing the efficiency"
>
> "We have an open door policy. It has a damaging effect on the efficiency"
>
> "The work needs a lot of concentration. The most efficient way to work is to turn off the phone"
>
> "It's time-consuming for the lawyers to talk with the trainees"

How did the conception of work correspond with the office design?

It did correspond very well.

The offices underline that the work going on in the law firm is individual work where it is necessary that you can close a door.

The combination of the different methods broadened the picture of the work going on in the law firm:

In our observations we saw that all the employees had a lot of informal meetings during the day. In the registrations of their work no one included those meetings and they did not include the major part of their working from home either. In the interviews we found that they didn't include the informal meetings because they didn't consider them real work and they didn't include the working late or some of working from home because it wasn't work that you could be billing.

In the interviews all employees described their work as individual but asked about their work the previous day the major part of the employees described informal meetings as a considerable part of what they had been doing. They also described that they worked from home nearly every night and weekend but this was a kind of invisible work. One of the partners said:

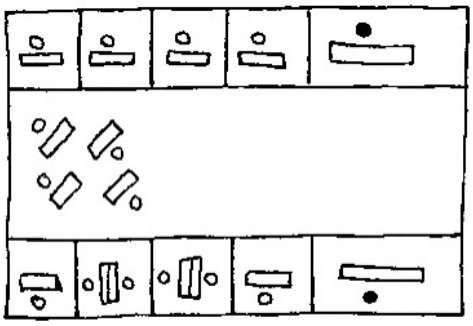
> "The workload is not heavy. I close the door at 7 pm. Most leave at 6 pm."

So we must conclude that the conception of work in the law firm only covers part of the work going on. We found that the individual legal work was not as individual as they described it.

In the law firm they wanted to increase and strengthen the collaboration in professional teams but hadn't succeeded.

The management as role model?

The management did have the biggest offices although they were often absent from the office:



LAW FIRM

● Management ○ Employee

They claimed that their strategy for the new office design was to increase openness and collaboration yet they always closed the door each time there where meetings in the partner offices.

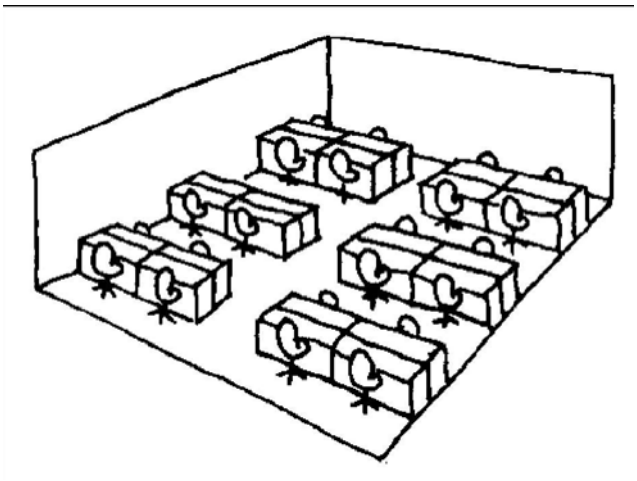
However, could you find an example on another conception of work and another office design within the legal profession? We located a law firm, Osborne Clarke, in Bristol which had taken quite a different approach. They asked the question:

How open are open doors really?

Osborne Clarke had introduced an open office environment where all the employees were placed in teams, with partners, lawyers, trainees and PAs in mixed teams. There were no personal offices, but different rooms for different activities. The partner here was not living his own undisturbed life. He was the team leader and they had a saying in this company that "The team leader's most important role is to be disturbed and interrupted".

The big difference between the Danish law firm and Osborne Clarke was not the office environment; it was neither the clients nor the tasks. But it was the difference in the conception of work – and the focus. At Osborne Clarke they saw law work as teamwork and had constructed their office design to match this conception of work. In the Danish law firm they saw law work as individual work and the focus therefore was on the individual work in the office layout.

2nd case study – an IT company.



In the spring of 2004 we made a case study in an IT Company. This Company had recently moved from an old building, with hallways and personal offices for everybody, into a new building with open offices for both managers and employees, project and café areas and some rooms for concentrated work.

The purpose with the office design was to introduce "New ways of working" and to create an office environment suitable for project work. Their definition was "Instead of traditional cooperation methods as phone calls, mails and long meetings we want informal personal interaction. This way it will be much faster to learn from each other and share our knowledge"…

The management wanted to change the way work was done in the company and they partly considered the new office design to be a change agent in itself: "We think that the openness in our workplace also will change our flow of work".

In this IT Company we made interviews with 60 persons from different departments: managers, team leaders and team members. We also made observations and registration of the use of facilities in the company and counted the number of people present at each desk at different times of the day over a period of 14 days.

What did we see?

In our observations we were very surprised by the quietness at the workplace. We did hear people talking at the phone or talking to one another but our general opinion was that the level of "noise" was surprisingly low. It felt more like being in a reading department in a library than being at a workplace.

In our observations we also saw a very standardized workplace – an office factory – where everybody was sitting in exactly the same long rows separated by partition walls. In the

middle of the workplace was a project area which was seldom used and a café area which was never used. There were an enormous amount of decorations at the workplace. Flowers, pictures, animals, dolls, bottles etc. In the beginning we thought this was because the employees wanted to show personal identity but on the other hand the decorations were so extreme that we thought it might be a protest against anonymity.

We also saw a workplace with a lot of empty desks every day.

What did they say?

In the interviews we asked each person to describe his or her working pattern. Some said they were working at their desk all the time. Others were away from the workplace most of the time. In average the interviewed estimated that they spent 63% of their working time at their desk doing concentrated work. Many expressed their reservations towards "just walking around talking with people".

> "I'm the kind of person who spend all my time at my desk doing concentrated work"
>
> "I'm programming all day long"
>
> "I'm always sitting at my desk"
>
> "Some people just walk around talking to others!"

Concentrated work was the focus in the interviews. The majority started describing their work as being 90% of the time at their desk doing concentrated work, but they moderated this opinion when we asked about other activities like meetings, working from home, mobile work etc.

We asked all the employees to describe their workday the previous day. Here 80% had a varied workday with a combination of at least three different activities and 20% had been at the desk working with for instance hotline or programming.

84% of the interviewed said that the previous workday was typical, so this was a big contrast to the description they gave of their work.

In our registration of use of facilities there were an average percentage of presences in the workplace of 45% and this figure also confronts the description the employees gave of their work. The combination of different methods broadened the picture of the work going on in the IT company. In our observations we saw a very quiet workplace with a lot of empty tables each day. In the interviews the employees estimated that they spent most of their time at their desk. Asked about the work the previous day the majority had a spread in working patterns and the percentage of presence underlined the variety. So again, like our case study in the law firm there was a major difference between registrations, interviews and observations.

What was their conception of work?

> "In my work I need peace and quiet. It is too noisy here. People show little consideration for the ones who are trying to work."

In this workplace the dominant conception of work was that work is quiet. Real work takes place at your desk and work is individual. The consequence is a conception where "noisy" is equivalent with "not quiet".

> "You get an angry look or are hushed at"
>
> "I've started sending mails to my colleague sitting next to me because the others are hushing"

With this conception of work, every activity at the workplace – other than sitting quiet at your desk – is very annoying for the actual work or for being able to work. According to this conception of work it is not "real work" to talk on the phone, to have informal meetings or informal talk or to walk around.

This conception of work led to a behaviour where it was your legal right to hush at your colleagues, get irritated when someone spoke or to send a disapproving look at those walking by.

How did the office design correspond with the conception of work?

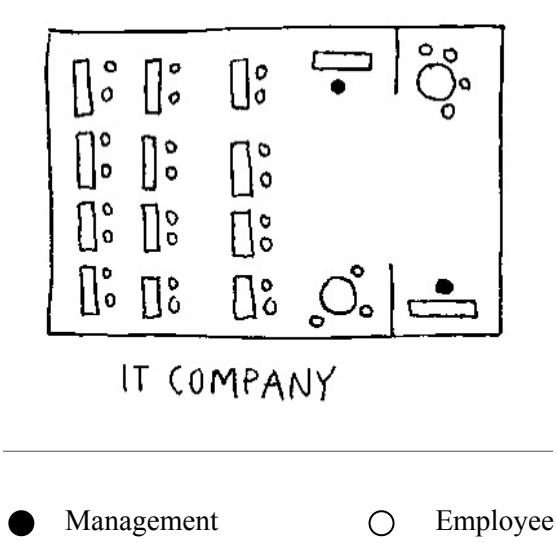
It did not correspond. For the people who saw their work as individual and believed that they had a need for concentration the open offices were at all times a disturbance to their work. For the people who saw their work as changing and flexible, the office design didn't correspond either. Not because it was open but because they were hushed at and looked at when they needed to talk to their colleagues.

We asked about advantages and disadvantages in the open office environment. There were 88 comments on advantages like increased collaboration, spontaneous comments, and accessibility and proximity. There were 28 comments on disadvantages like noise, telephones but also 35 comments on the restrictive influence on social and professional exchange. So no

matter whether the employees were pro or against the new office design it didn't support the way people felt about their work. Not because of the office layout but because of the codex for acceptable behaviour in the office made by those with a conception of real work as quiet undisturbed concentration.

The management as role model?

The management were also placed in the open office environment but they had taken the best corner:



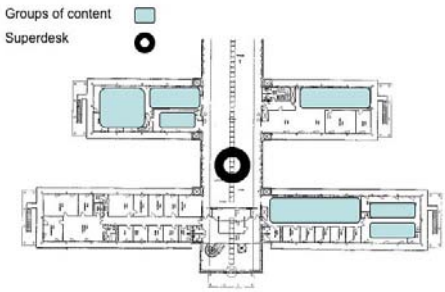
They never used the café areas and one of the management groups was sitting in the project area. There were some small offices meant for concentrated work, which the managers used all the time for meetings. So we can conclude that the management only apparently were part of the new office design. Their behaviour was the same as if they had had offices and there is no difference between the managers in the law firm and the managers in the IT company. They have a different office layout but both groups still focus on status and behave in opposition to more openness and collaboration.

3rd case study – a media company

The Superdesk

In the spring of 2005 we made a case study in a media company. It used to be a newspaper company, but in 2004 they changed their strategy and became a media company now running the paper, a television station, two radio stations, a free paper and a web service. The transformation from newspaper to a cross-media company was executed by gathering the different media types in the same building and by considering where people and activities should be placed in order to support the idea of multi-mediality[2]. The office design was seen as a strategic artefact to enhance cooperation within groups, between groups and across the different medias.

The media company chose an open office solution with a big hall in the middle surrounded by open group offices. The group offices were divided into different content themes e.g. society, lifestyle, culture, business and sport and in these group offices the content reporters were sitting close to their colleagues. The groups delivered content for the different media platforms. Technical equipment was placed in the groups for the production of radio and television programs e.g. recording studios and editing rooms. In the middle of the big hall a Superdesk was placed where the media editors - responsible for the different media - were placed in a round circle, and in the middle of this circle there was a round table where coordinating meetings took place three times a day. In the big hall there was also an open television studio.



In the media company we have conducted 33 interviews and 45 questionnaires. Questionnaires were used as supplements to the interviews after most interviews were carried out. They were, in contrast to what is often seen, more targeted and specific than the interviews, aiming to get a broader dimension to specific questions that were dealt with qualitatively in the interviews.

We made observations using a combination of field notes and different counting methods like registration of activities and movements by means of elements of space syntax analysis (Steen et al. 2003). We have also made observations following key-people for a day.

What did we see?

Both in the headquarters and at two local editorial offices we have observed alternating work patterns. We have seen a lot of walking around, many questions asked out in space, humour and laughter and a sense of people knowing each other well. We have seen a lively workplace with plenty of motions in the rooms, exchange of ideas, coordinating, sparring, questions, absorption, telephones and laughter. We have heard noisy keyboards, music, television, laughter and talk. In some of the editorial offices we have experienced silence late in the evening.

What did they say?

The employees described their assignments as being cross media. Most of them understood cross media as television, radio and newspaper including research, coordination, writing, editing, interviewing and taking still and motion pictures and being a host.

Some said that they “did anything”, were “handymen” or foremen.

In the questionnaire survey 84% of those who answered the question agreed on the statement: “cross media is my work”.

The working hours were described as being as flexible as the working pattern. It was virtually impossible to find two employees with the same schedule. They had 3, 4 and 5-days weeks, they changed between 4 and 5-days weeks, flexible hours, duties covering news, day

and evening duty. The working pattern was described as being very flexible, adapted to events and stories, but also to family life.

In our interviews we asked the employees to describe the previous working day.

The working day was described as being alternating between various activities. Formal meeting activities, informal meetings, to read and answer mails, to be out of the office, to write, to be on the phone, to edit, to do administrative assignments, radio features, television features and photo assignments.

Each employee described an alternating working pattern with three different main activities on the average. The two most important main activities were meetings and informal meetings followed by editing, interviewing, writing and sending/answering mails.

> "The relation between working in the field, editing and the time in the editorial office changes according to the stories".

So there was a connection between the descriptions of work in general and the description of work the previous day in contrast to the findings in the law firm and the IT company.

Where did they work? They worked almost everywhere. On average each employee had 3 - 4 different working places: The Superdesk, meeting rooms, at their desk, in the room, around the house, in the field, working on the move and working from home. 17 out of 26 employees said that they work from home. Most of them checked their mails from home, and some of them conducted telephone interviews from home. Only 3 employees sometimes had a full-time working day from home.

The work in the media company was in general described as having meetings, conducting interviews, writing, planning, coordinating, taking photographs, producing etc.

We have made 10 snapshots of what was going on in all editorial offices. We observed 93 meetings or conversations with a total number of 215 participants, 198 people working at their desks, and 43 employees talking on the phone. 50% of all meetings involved a person sitting in front of a computer and a colleague standing next to him/her. On average each desk was occupied 31.5% of the time during the snapshots.

Informal meetings were an activity frequently mentioned by the employees:

> "We talk to each other a lot"
>
> "Informal meetings 2 – 3 hours per day"
>
> "Talked to my partner a lot"
>
> "Informal meetings is my job"
>
> "Spend a lot of time having informal meetings in the office"
>
> "We have no formal local meetings in the XXX editorial office. We talk a lot during the day, so we are always aware of who is doing what. Thus formal meetings are unnecessary".

What is considered a waste of time in many organisations was here a deliberate strategy.

In the questionnaire survey 66% (of those who answered the question) agreed on the statement "Having informal meetings is my job". Furthermore the job was described as moving around the house:

> "Run about the house a lot"
>
> "Move around the house a lot"
>
> "Tear about for 1-1.5 hour"
>
> "Go rounds for half an hour"
>
> "I do most of my job walking around"

The combination of different methods supplemented each other perfectly in the media company. In our observations we saw a lively workplace with people talking, walking, running and concentrating. Asked about their work in interviews they describe their work as a lot of different activities taking place a lot of different places. Asked about their work the previous day they describe a workday similar to their general description of their work. In the questionnaires this description of work is supported and it is also supported by the snapshots we made. Our method to understand the conception of work of any organisation is a combination between observations, registrations, interviews and questionnaires. In the law firm and in the it company there was discrepancies between what we saw and what the employees said, but in the media company there was a perfect match. We observed exactly what people said which we have never experienced before.

What was their conception of work?

The conception of work at the media company was that all kinds of work were "real" work. All ways of working were equally right.

There was a focus on that work equals cooperation in pairs of two - that colleagues exchange ideas. That work consisted of an alternating pattern and could take place anywhere.

> "The day was atypical, but that is really typical".

At the media company work was described as a formal and informal cooperation with colleagues, interviews, shootings, editing, reading and writing articles.

And work took place everywhere: In meeting rooms, in the office landscape, at the desk, in the car, "around the house", "in the field", in the studio, at home.

That work equals to cooperation was being emphasized by the fact that work was described as informal meetings, "sparring" and "walking round" the workplace.

How does the conception of work correspond with the office design?

It corresponded well. In our interviews we asked what the purpose with the office design was and most of the comments were focussed on increased openness, collaboration, fast communication, and accessibility.

”That we should be placed physical in relation to our work - to ensure faster communication”.

”It supports the daily coordination and collaboration. I constantly listen in on what’s going on”

In the interviews 70% claimed that they were satisfied with the office environment:

”I’m seated perfectly in the big room. The noise doesn’t bother me”.

”It’s extremely well designed. You can walk right over to everybody within a minute”.

”I can’t do my job elsewhere”.

The satisfaction with the office design is primarily a satisfaction with an open solution and with the Superdesk as a centre for coordination. The employees regard the office environment as a strategic tool for cooperation and they think that the openness supports the way they work. In the questionnaire 63% agreed that their group was well placed. They are sitting closely together with their cooperation partners – sometimes to close – but they find that the idea of an open office environment is ideal for their kind of work.

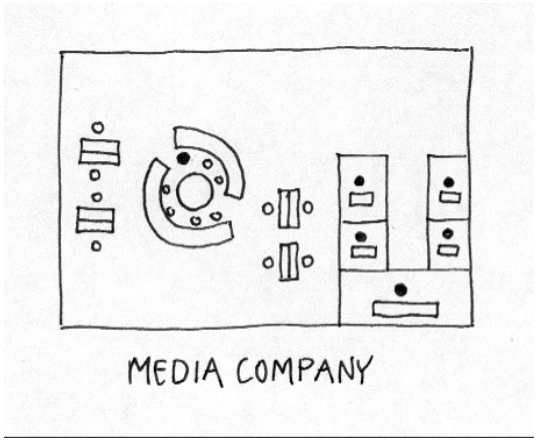
The advantages that were generally mentioned – by sitting in open offices – are:

- being close to cooperating partners
- being able to follow each others work, - to see and hear what happens
- being close to other groups

The disadvantages were noise and crowdedness. In the questionnaire 56% were often disturbed by noise, but all in all there were only 7 persons (out of 60) who would like their own office so this underlines that the office design supports their conception of work.

The management as a role model?

The management and editorial staff (8 persons) had their own private offices in contrast to the journalist who were placed in open offices. However, the offices of the editorial staff were rather small and in our interviews it became clear that the employees believed that there was no status connected to having own office.



● Management ○ Employee

Furthermore, the editorial staff took turns as media conductor and as a media conductor they worked at the Superdesk along with everyone else.

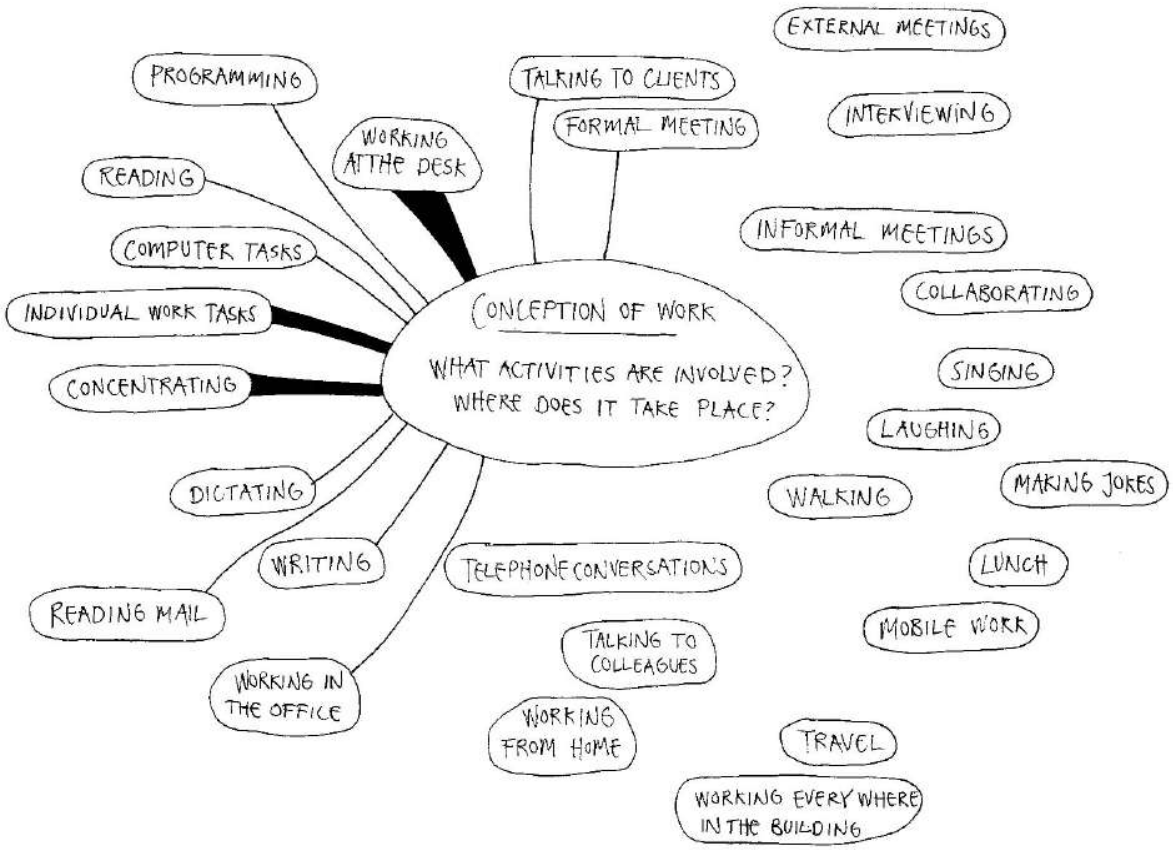
> "All I did that day was to talk to people. That's what's all about."

> "My job is to talk to people – both arranged meetings and spontaneous conversations."

So the management behaviour was not seen in contrast to the strategy for openness and collaboration because they took part in the work going on in the open office in contrast to the managers in the law firm and in the IT company. The managers in the media company were not focussed on status but in the interviews they were a bit embarrassed of their offices and they also had plans to change the office layout for the management. So even though the managers in the media company had their own offices it was not seen as a contrast to the solution the employees had because the management behaviour was non hierarchical.

Conclusion

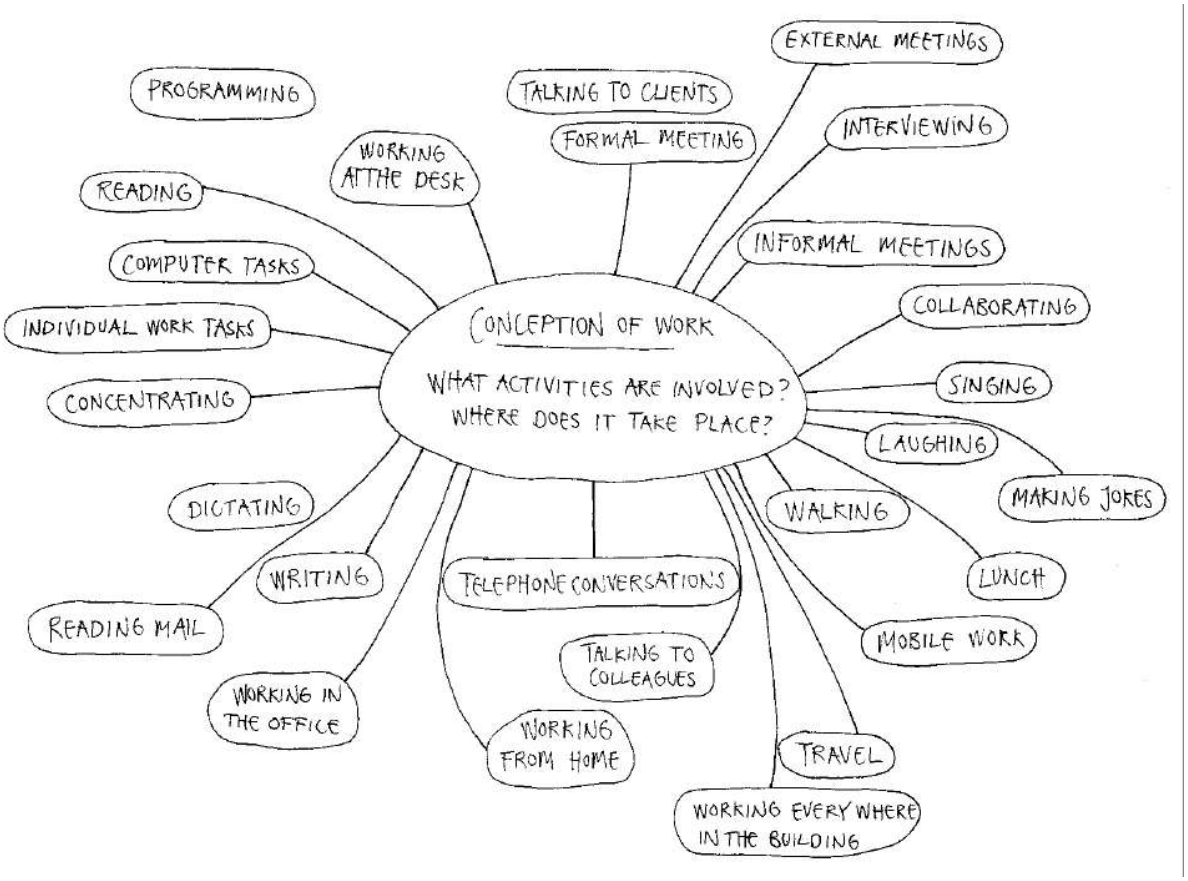
In all three cases we saw a range of different working patterns and working task, but in the first two cases only part of the work going on was considered real work. As illustrated in this figure:



The conception of work in the Law firm and the IT company

In the law firm and in the IT company most of the work activities and workplaces on this figure are what they actually are doing – but they only consider the individual working task as real work. All the other activities are unplanned, not effective, disturbing or stealing time from the real work.

In the media company the focus is on collaboration but all working activities and workplaces are representing real work. In the media company the real work is the work going on!



The conception of work in the media company

If you compare our three cases the big difference between them is not the office design but the conception of work. The office design has become a catalyst for the underlying conception of what real work consists of. In fact, asking about office design gives a reaction where people want to describe their work in detail either to support the office design they already have or to avoid a change. This conception of work focussed on the office design is not only interesting in order to understand the background for the different opinions for having an optimal office solution. What's much more interesting is that this conception of work reveals an attitude towards real work that works against collaboration and knowledge sharing.

The conception of work as individual, concentrated and quiet could on one hand be expressive of a habit and on the other hand a protest.

As a habit it reflects the industrial society work mindset. You'll have to produce something visible.

As a protest it reflects an invisible anger towards the management who have made conditions you can't work in.

If your conception of work is in harmony with the actual work going on and legitimate peripheral participation, informal meetings and walking about is considered to be proper work, a new office design will be able to support this type of learning and knowledge sharing. However, if your conception of work is that these activities are not real work then changing the office design will not improve knowledge sharing and learning.

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Endnotes

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[2] For more information on the transformation to cross-mediality see Aaløkke, Bjerrum, Bødker & Bechman 2005.

Do You See? Visual Representations as ‘Artifacts of Knowing’

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Abstract

Recent work describes knowledge as a social accomplishment, situated in the ongoing practices of communities. From this perspective, knowledge is seen as dynamic and provisional, rooted in interactions between people and objects. Visual representations play a role in mediating knowledge and knowing, and, in this paper, we articulate a number of ways in which they act as 'artifacts of knowing.' We illustrate the account from a study of design work in Edward Cullinan Architects. Here the intensity of interaction with objects and visual representations is immediately striking. Visual representations, of existing contexts and desired new developments, play a role in substantive work in the design studio and in the wider organization of the construction project. We conclude by drawing a number of comparisons between this study and existing studies of knowledge work.

Introduction

It is commonly said that a picture is worth a thousand words. So what, we could ask, is the role that pictures play in contemporary organization? When are they used and why?

Recent understandings of knowledge work see it as a social accomplishment, closely associated with interactions between configurations of people and objects (Knorr-Cetina 1999; Gherardi and Nicolini 2000). Skills are seen to be underpinned by object-centered relationships that come to life in small contextual settings (Knorr-Cetina 1999: 218). Visual representations constitute objects that play a role in mediating knowledge and knowing. Such objects, or 'artifacts of knowing', are usually conceived of theoretically in terms of language and texts; or in terms of machinery, instrumentation and equipment. This is, in part, an expression of the way debates around the knowledge economy and the knowledge society have centered on expert knowledge developed in the sciences and transferred into society more widely (Giddens 1990; Beck 1992). Knowledge embodied in visual representations is generally underrepresented, although the importance of visual representations has been noted in a number of empirical contexts, including scientific practice (Latour 1986; Lynch and Woolgar 1990) and engineering design (Ferguson 1993; Henderson 1999). Increasingly, interactions with visual representations are noted in current research in a number of contexts, from studies of the mobility of medical images used by radiologists and radiographers (Coopmans submitted) to work on the role of PowerPoint presentations (Kaerreman and Strannegard 2004; Gabriel and Griffiths 2005). However, we still know relatively little about *how* visual representations mediate knowledge and knowing in such contexts.

In this paper we set out to consider visual representations as 'artifacts of knowing.' We see visual representations as deliberately constructed images, with both intentional and unintentional features, where examples include photographs, drawings, sketches, and computer-printouts. As Elkins (1999) points out the commonest types of images are not

purely pictures, notation or writing but are a hybrid between pictorial, geometric and scripted elements. Hence the position taken in this paper resists the linguistic turn that characterizes all artifacts as texts, or writing that is subject to different readings. We believe that the metaphor with written language hides as well as reveals aspects of the relationship with visual representation. Even in text, such as this, the typographic font one uses has pictorial elements. The focus is on the use of visual representations to mediate knowledge and knowing. In other words, we ask: *How does the manipulation of visual representations play a role in the practices of generating, evolving and exchanging knowledge?* We build on a number of strands in the existing literatures, and illustrate our account from fieldwork in an architectural design practice.

Related Literature

The particular role of visual representations as 'artifacts of knowing' has begun to be articulated in cognitive and sociological work on design and engineering. However, these literatures are often viewed as outside the traditional boundaries of organizational theory, and hence insights have not been incorporated into existing understandings of knowledge and knowing within organizations. Elsewhere we have reviewed these literatures more extensively, to support our argument that the manipulation of visual representations plays a significant and under-recognized role in industrial innovation processes (Whyte, Ewenstein et al. submitted). Here we paint a very broad-brush picture to provide a backdrop to our empirical work. We are not advocating a wholesale or unreflective integration of these disparate streams of work, but believe that it is fruitful to draw on their insights.

The classic studies into the nature of professional work are pertinent to our questions about the role of visual representations in knowledge and knowing. Simon's (1969) work brought an understanding of professional work as design, rather than science, highlighting the way in which the professional habitually deals with problems of such complexity that optimization is impossible. Such problems have been described as 'wicked problems' (Rittel and Webber 1984)., in which the problem can never be fully stated outside its solution. The practical challenge is to 'saticfice'(Simon 1969): to construct a good option taking into account the wide number of constraints and factors (which can only be partially comprehended). There is a high degree of choice in this process and a good option may not attempt to hold all things equal but rather prioritize and fully satisfy one factor, whilst failing to address another at all. Schön (1983) extends this debate, though it does not directly cite Simon, he takes a conversation between a novice and expert designer, who are interacting around and talking about a drawing, as the starting point in explicating the nature of professional work and its focus on solving wicked problems.

Schön's analysis of novice and expert cognition in design has been taken up in the design studies tradition. This work underscores the role of visual materials as artifacts of knowing productively used by individuals. By drawing on this tradition we highlight the role of visual

representations in overcoming limits on an individual's cognitive capacity and reducing cognitive load. In these literatures visual representations are discussed as serving at once as external memory as well as a site of reasoning and reflection: they can constrain inferences and reveal problem structure. Visual representations can make a design problem explicit, therefore reducing the amount of cognitive effort required to solve such problems (Scaife and Rogers 1996). Engineers and designers may make unexpected discoveries in this process of interacting with representations (Suwa, Gero et al. 1999). Moreover, using multiple representations side by side can make visible different aspects of a problem. Meanwhile, the modes of expression adopted when using representations can range from highly detailed and concrete to ambiguous and deliberately vague. This openness bears possibility and thus invites spontaneous emergence and creativity.

In contrast with this stream of work focused on the individual designer, our interest is in the externally focused activities of professionals within the workplace. As new product development is usually conducted in multi-disciplinary teams, it requires the circulation and communication of specific pieces of information as well as coordinating the inputs of different forms of specialist knowledge. Pointing specifically to visual representations, we concur with Eckert and Boujut that, "objects play an essential role both in communication and joint designing by designers who share expertise and experiences, and in communication between people who have radically different skills, experiences and responsibilities […]" (Eckert and Boujut 2003: 146). Work from a sociological perspective emphasizing intersubjective aspects seems promising in illuminating these communication and collaboration activities. In these literatures the terms 'inscription device' and 'boundary object' have been taken up to interpret engineering design (Henderson 1999) and the role of knowledge in organizations and new product development (Carlile 2002). Building on the community of practice literature (Lave and Wenger 1990), Carlile describes how boundary objects are used within and between communities of practice thus clarifying three characteristics of knowledge in practice - that it is localized, embedded and invested in practice. These ideas have also been taken up by authors in the innovation and technology management community such as D'Adderio (2001; 2003); Yakura (2002) and Sapsed and Salter (2004) as well as permeating discussion on engineering design and computer supported collaborative work (Eckert and Boujut 2003; Schmidt and Wagner 2003).

More specifically, Henderson has built on the notion of inscription device to argue that it is the "meta-indexical" quality of visual representations that makes them so powerful. Meta-indexicality refers to the capacity of visual representations to be a holding ground and negotiation space for both explicit and yet-to-be-made explicit knowledge (Henderson 1999). In other words, visual representations function as arenas for multiple ways of knowing (ibid.). Thus visual representations focus different forms of expertise upon certain aspects of a developing design. In very practical terms, then, the use and exchange of visual materials is a key mechanism through which collaboration in product development is managed. Knowledge is constructed in dialogue and negotiation as members of different functional or disciplinary

backgrounds articulate their perspectives, in the twin sense of both ‘expressing’ and ‘conjoining’.

Setting and method

Edward Cullinan Architects is a professional service firm, offering architectural design services in the construction sector. Founded in the 1950s by Edward Cullinan (commonly known as Ted), the practice has been a major contributor to the development of post-war British architecture. Work of the practice is frequently described in the architectural press, and has been written up in a number of monographs (Edward Cullinan Architects 1984; Powell 1995; Hale 2005).

The firm has a well established culture, which puts value on the collective. Unusually for a commercial organization, it is a partnership in which every member of staff acts as a partner. It is housed in an old warehouse in North London, the ground floor of the building houses meetings rooms and a kitchen, and there is a single, open, office space upstairs in which all members of staff work, with bays providing a home for project teams.

The practice faces a number of challenges relating to the continuity of knowledge and knowing, as its 74-year old founder heads past the age of retirement. Ted is an exceptionally talented architect, who makes a strong contribution to life within the firm. Since he founded the practice it has changed from a small group of men to a modern office of 40 male and female staff. Over this time working practices have also changed, with the introduction of computers, word processing and computer-aided design. Ted remains actively involved in the conceptual design of projects, though he is now the only member of staff not to type their own letters or to use the computer for design work.

We followed design practice on two ongoing projects; observing and interviewing key members of staff, collecting secondary data and being involved in informal conversations regarding work. We also arranged for a number of feedback sessions with groups of architects interested in our work. To minimize the disruption caused by a research presence, once the initial contact was made, the second author acted as the main point of contact. He spent 130 hours (or 33 days) with the firm over a 6 month period. During this time he was involved in site visits and client meetings. He even features in a perspective drawing of one of the proposed facilities.

The project we analyze in this paper is the new Herbarium in the Royal Botanic Gardens at Kew Gardens. This is an extension to one of the world’s most important herbariums. It also houses a library and Kew Garden’s information services department. The practice has previous experience in working on Botanic Gardens in Edinburgh and Cambridge which was probably important to them in winning the bid. We studied the period from June 2004, the end of their inception and feasibility studies, when we observed discussions finalizing the report of these activities (known as RIBA stage A/B); to the end of the conceptual design stage, which was formalized in the Stage C report in November 2004.

Overview of the data

In everyday practice on the design project within Edward Cullinan Architects, the intensity of interactions with objects and visual representations is immediately striking. Practitioners rarely stop to reflect on the function of these objects and representations. They are so familiar as to be rendered almost invisible to them. Yet to the outsider the design studio in which they work is full of images. Schedules, plans, sections, elevations, and perspectives are used to project out desired future states: some are active, others discarded; some complete, others partial; some hard-line and formal, others sketchy and informal.

Visual representations are used to depict both the content of the work, and the processes by which this work is achieved. Here we focus mainly on representations of the former, but in practice the two aspects are inextricably linked. Plans, sections, elevations and perspectives that are used to represent the proposed new development and its context are used alongside a set of representations of the formal processes of construction, with its stage gate processes, co-ordination mechanisms and regulatory inputs; onto which are mapped desired timeframes and outcomes, attribution of responsibility.

The type of visual representations used to progress the design work, and the purposes for which they are deployed vary across the stages of the design project. In this paper we focus specifically upon the timeframe in which feasibility has been established and work has commenced on the conceptual design of a building. At this stage there is already an outline plan, but understanding of problems and solutions is relatively fluid, the plan may evolve, or shift focus, and existing plans are constantly renegotiated and tested from different stakeholder perspectives. In the case of the project we studied, there are clear parameters for the design at this stage, and at the end of our data collection phase a member of the firm described the difference between this project and the average project by saying:

But it's a very elegant solution that continuously evolved as the brief ebbed and flowed. Unusually smooth. I mean, because it works. You saw it playing all the way through. It's normally much more violent. Because there were changes to the brief all the way through, at the same time as we were changing our ideas, and refining our ideas, and refining them to the brief. So to that extent it was very much that kind of process where, you know, the constraints were our ideas and the project is getting closer and closer and closer to the answer. But that's not what normally happens.

Architectural practitioners work together on the project within the design studio. However, a construction project is also a form of organization that cuts across professional groupings, firms and disciplines to link individuals to a common objective around a particular site and brief. It reflects descriptions of communities of practice (Lave and Wenger 1990) or action-nets (Czarniawska 2004) as individuals work with other types of design and engineering professionals, with regulators, action-groups, clients and end-users.

In the following section we look at the role of visual representations as 'artifacts of knowing' in the design studio, and then we turn our attention to their role in this wider organization and co-ordination of work on the project. We will not attempt a comprehensive

description of the diverse functions of visual representations in either context, but rather pick on particular incidents to illustrate our aspects of their use.

Visual representations as 'artifacts of knowing' in the design studio

We see the design studio as constituting a space for practice, understood as rehearsal (Star and Strauss 1999). It is here that the backstage work of design is conducted. Our purpose in this section is to articulate how visual representations mediate knowledge in such a setting – what types of representations are used, when and why they are used and what purposes they serve.

Within the design studio there are many different types of objects and images. Some are brought into the office from the existing built environment: these include photographic images of the site and small scale samples of actual materials. Others originate within the office: these may include plans, elevations and sections of schemes for the new building; and also schedules for managing the design process. Most representations are hybrids: they are mobile, being circulated and transformed across the boundaries of the organizations, disciplines and professions working on the construction project. The same representation may incorporate information of existing parameters for the design, and the design for the proposed new buildings. Different types of representation such as plans, section and elevations convey different information, yet they can also be expressions of integrated design ideas: For instance, a senior partner in the practice advised us that Ted, the practice founder, possesses the rare ability to draw a plan whilst imagining the section and elevation of the building and holding them in focus.

We take as an example an occasion when three architects sat and worked together on the conceptual design of the building. Ted Cullinan, the Kew Herbarium project manager as well as a project architect are discussing different conceptual approaches to the client brief. They were exploring different approaches to accommodating the clients' herbarium storage requirements, office needs, traffic and circulation modes and future developments aims of the client more widely. As the meeting continued, the desk was increasingly littered with various fragmented ideas and thoughts, embodied in a host of representations. A masterplan, previously designed by another practice was in use alongside a plan of the existing area (scale 1:1000) onto which different options for the future addition were sketched. Tracing paper marked with the outlines of such potential buildings were created and scattered as the designers explored a range of options.

Figure 1. *Design work in progress within Edward Cullinan Architects*

Such images combine traces of writing, pictures and notation (Elkins 1999). They are close to pure notation in that they are based on geometric forms, such as reference lines – curves, scales, grids, nets or other geometric configurations that order the image (Elkins 1999: 91), but they contain symbolic (readable) and pictorial aspects.

Through this work, some objects are detached from their natural environment at the site and transported into the design studio using pictorial conventions. These representations act as a proxy for objects that are located elsewhere. Details of the existing physical site for the new development may be obtained, for example, from aerial and ground-level photographs or existing maps and plans. The representation of this data is highly stylized so existing trees, for example, are represented schematically in terms of circles that define their lateral spread.

These representations are manipulated and used in conjunction with representations of the desired new development that may be more notational and less pictorial in format. They provide resources to the epistemic work that is in progress, but may also provide the content of that work as new developments require changes to the existing site such as the removal of trees or the rerouting of existing traffic flows. Representations of future desired states act as a proxy for objects that may come into being in the future.

Interaction with these images is used not only to represent what is known, but also to learn about what is not known. The process of designing complex social and technological systems, such as buildings, involves managing a range of unknowns: these include indeterminacies; ambiguities; ignorances and uncertainties. The consequences of technological choices are inter-related, and the prioritization of these factors may also be unclear at the beginning of the design process, there is an advantage in leaving things ambiguous or sketchy in the preliminary drawings to delay decisions where inadequate information is available. Thus visual representations are used as holding grounds for these later decisions. Hence, Henderson (1999) has described such representations as consisting of both explicit and yet-to-be-made explicit knowledge. Based on our observations we would go further to argue that this unstated information as not simply yet-to-be-made explicit but also, in many cases, yet-to-be determined. Whilst we could observe the role of ambiguity within sets of representations, it is also important to note that the practice generally strives for concrete representations. In discussing our observations with a senior member of the practice we were told that where

possible definition is aimed for so as to produce a strong response from stakeholders, in other words 'to provoke conversation and disputation', inviting critique and commentary.

Visual representations as part of collective knowledge-work

Interactions between the architects and other professionals working on the project are organized around sets of visual representations, which are often prepared in advance. To describe the work that visual representations do in this context we use as an example a meeting between the Buildings and Maintenance Department manager (project leader on the client side), the traffic engineer and architects from Edward Cullinan Architects in which several options are evaluated. This meeting took place at the site for the new building, in a room that had been provided by the project client. The participants organized themselves around a set of prepared representations, which were central to the discussion. The advantages and disadvantages of each option were articulated and discussed by the participants. Photos from the ensuing discussion are shown in Figure 2.

Figure 2. *Co-ordination of design work with other professionals: snapshots from a meeting between the architects and the highway engineers*

As these snapshots show, visual images are the focal point of the conversation and the speaker often uses a pen as a pointing device to draw attention to the features being discussed and to fix attention to it whilst it is considered from different perspectives. No firm decisions have been taken at this stage, and the conversation is sketchy and tentative, with people often interrupting and finishing each others sentences. This is clearly not a meeting in which previously made decisions are ratified, but it is rather a working meeting in which knowledge is constructed through shared cognitive processes. Whilst the documents show options which have been drawn up by the traffic engineer prior to the meeting, alternatives and refinements to these are also proposed during the flow of the conversation as the benefits and limitations of the options are explored. Focusing attention on concrete proposals stops the conversation from shifting endlessly and forces the participants to make decisions about preferred solutions. Physically pointing to the drawing with a pen is one of a number of techniques used to anchor the conversation and bring it back to the range of preferred solutions.

What is particularly interesting here is the wide range of sensibilities that experts bring to evaluating the various possibilities. As discussed in the previous section, professionals are able to hold in the frame a wide range of unquantified aspects; ignorances, uncertainties and risks. This is a process of satisficing (Simon 1969), in which understanding of the problem and potential solutions change together. Concerns about vehicle noise jostle alongside consideration of driver visibility and topography. Visual representations and conversation work together in assessing the advantages and disadvantages of the options:

> Traffic engineer: I just imagine vehicle noise will echo in here a little bit.
> Project manager (client side):I'm just wondering is there another option to have that opening down here? Like that way? To try and avoid that?
> Lead architect: Yeah.
> Traffic engineer: It's possible. The only thing that I can think of, is that you have sight-
> Project manager (client side): sight lines.
> Traffic engineer: …stopping sight distance problems. So for anyone leaving here, they'd have to be able to see who's coming around the corner.
> Lead architect: What about having the exit up there?
> Traffic engineer: The exit up there? I have no objection to having it up there.
> Project manager (client side): Have it sort of flow in and then round and out?
> Lead architect: Yeah.
> Project manager (client side): Might be better.
> Traffic engineer: Yeah.

This work is not about briefing users, but is rather a joint process of highly technical problem-solving. It reflects descriptions of brainstorming in the product design firm IDEO, which points to the effectiveness of such shared activities when there is a high interdependence between tasks (Hargadon 1999). The visual representations function as 'boundary objects', but what makes them effective is the potential for pinpointing relevant spatial and geometric aspects of the problem. Traces of writing, pictures and notation aggregated within the images used have different salience for their different audiences. Indeed it is interesting to note how one speaker in this meeting maps a particular location on the site on two different representations, providing a way of reading them in parallel. In this meeting the architects, the traffic engineer and a knowledgeable client, who as manager of the Buildings and Maintenance Department is highly skilled and conversant in construction issues, can be seen to represent epistemic cultures or communities of practice. As competent professionals, notational aspects relating to their field may be understood at a glance, before aesthetic and expressive aspects of the particular image are absorbed or related text is read. Text may only be used as a back-up to decipher the notation in case of ambiguity. However, for end-users, including the botanists, librarians and information services staff members, who may not be as skilled in deciphering architectural drawings, this sequence may be reversed, prioritizing text and more concrete representation. The use of images in end user interaction may be expected to show different characteristics.

Concluding Remarks

Our data suggests that visual representations play a highly significant role in some forms of professional work. In these contexts, it does appear that a picture is, indeed, worth a thousand words. Visual representations allow professionals to specify geometric and configurationally data more precisely than they could possibly do with words alone. Yet our analyses of professional work have tended to bias the written, or have conceived of all artifacts as texts. This is a bias that is propagated and maintained by the academic community's own characteristics as an epistemic community in which we place an emphasis on written word, valuing publication in books, journal papers and articles as a means of research dissemination. This research suggests that in our approach to the broader spectrum of professional knowledge work we must be open to contexts which do not conform to this bias.

Studying knowledge work is extremely challenging, as professional skills such as architectural design are accumulated through deliberate and dedicated practice extended over a lifetime. Internationally acclaimed architects are usually in their forties and fifties, as it takes decades to learn the skills to operate at this level. What hope do we have of understanding such work? Well, there are certainly limitations. The intention here is not to study the content of what these professionals do, but rather how visual representations feature in such knowledge work. However we take the view that it is important to study such practices in the context of everyday professional practice. In this our approach is different even from some theorists of professional practice. Schön used as the context for his initial study the educational design studio rather than the professional service firm. In the context of design teaching, the conversation between the expert and novice is relatively easy for the reader to follow. In professional practice, the conversations between experts are incredibly dense and wide ranging and are hard to interpret as they operate on many different levels at the same time.

There are a number of limitations to our study that offer themes that may be explored in future research. Not least we had limited access to computer work and computer exchange and yet this plays an increasingly important role in this sort of knowledge work within firms. We also conducted the detailed observation over the timeframe of one stage of each construction project we followed. Within the context of such an architectural project, a range of visual representations are manipulated in the place of the final object. However, over a longer timescale, the final buildings themselves are implicated as objects that embody knowledge and knowing across projects. For example, during one of the conversations that we observed within the practice, an architectural magazine which contained photos of one of the previous projects was used to bring aspects of this project into the discussion.

Our observations of knowledge work in this context have some commonalities with previous accounts of engineering and design in other professional contexts, such as Henderson's (1999) studies of engineering. However, comparison also points to the diversity of epistemic communities that exist in practice. Whilst Henderson's focus on design within the context of the multi-divisional manufacturing firm points to internal negotiations with a

remote management strata and with inputs from diverse functional divisions, our study highlights the way that all levels within the design firm are directly involved in, and value, the content of design work. Negotiation across disciplines takes place across the boundaries of the firm in the epistemic community that is formed around the construction project. Such a comparison serves to highlight and make visible a number of features of our case, bringing into focus differences, contradictions, discrepancies and variations with previous work that may provide themes for further research. Certainly, the existence of fragmentation and diversity across contemporary engineering and design is also confirmed by our first-hand experiences of knowledge practices in other design contexts, including high-tech manufacturing but also structural engineering. It reflects the now well-documented disunity of science (Knorr-Cetina 1999).

Wider comparison with accounts of knowledge practices scientific research also highlights the particularity of this context. The design studio operates as a 'laboratory' for design, instead of working with the objects as they occur in nature, object images are used to capture and transpose the site to a scale at which it can be comprehended in a glance. They are manipulated in transformed and partial versions through plans, sections and elevations. However, whilst laboratory science ignores the environment from which the natural objects are abstracted; design studios need to represent this environment in stylized and abstract formats. This is because of the different nature of scientific and design work. Within the scientific laboratory natural objects are taken into the laboratory for manipulation and analysis, but in design work man-made objects are manipulated into existence and placed into the pre-existing natural environment. Just as laboratory science does not need to put up with the object as it is, so too does the design studio substitutes transformed and partial version of the existing site and structures, within which a new building will be accommodated. But the large part of design work is involved with manipulating objects that do not yet exist: projected futures. Visual representations appear to play a significant role in a number of these contexts. Knorr-Cetina (1999: 80) has argued that epistemic cultures may construct their world in terms of sign processes, or continuously construct it away from such processes. Molecular biology practice, in the laboratories studied, shows the latter tendency. Architectural design seems to show the former tendency and is heavily dependent on knowledge work through sign processes (e.g. in the form of aesthetic reflexivity, Ewenstein and Whyte 2004), showing a preference for knowledge acquired through mechanisms that turn attention towards sign-mediated experience.

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Beyond Enacting Technologies for Knowledge

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Abstract

This paper presents a conceptual framework taken fron da Orlikowski's study about new information and comunication technology (ICT) in workplaces, Giddens' Structuration Theory and Archer's critical realist theory for the analysing of the issue of the organizational innovation through the introduction of ICT. In particular, I address the role of the desires in the «enactment» of the ICT and the interactiont between these latter and the role of the structure and the culture of the organizational order.

Introduction

This paper presents a conceptual framework developing Orlikowski's study about new information and comunication technology (ICT) in workplaces, Giddens' Structuration Theory and Archer's critical realist theory for the analysing of the issue of the organizational innovation through the introduction of ICT.

In particolar I try to account for the "frustrated desires" of some teachers in an Experimental Project. All the users desire to modify their existing ways of doing things to improve the experimentation of new didactic practices through the introduction of an information technology (Repository). However the fulfilling of their desires is a failure.

Orlikowski's study (2000) introduces the concepts of «enactment», «emergent structure» and «technology-in-practice», with an explicit reference to Giddens' theory of Structuration (1976, 1984) and to Lave's studies (1988) about situated cognition[2]. According to Orlikowski these new concepts highlight the role of the actors in the structuration-process, when it (re)produces rules and resources, with the contribution of technologies.

However these new three concepts fail to explain 1) *why* the actors desire to change their existing ways of doing things (and why they want to change in one way and not another) and 2) *how* they succeed to fulfil their desires. A study in greater depth of Giddens' Structuration Theory and drawing upon some concepts of Archer's critical realist theory will allow us to understand how much the desires and passions have been a specific and special role: to share the "new" experimented pedagogic practices and the related innovations. Without overlooking, as it seems to happen to Orlikowski, how much these desires are bound by the organizational and inter-organizational constraints.

Beyond Enacting

Orlikowski (2000) claims that «viewing the use of technology as a process of enactment enables a deeper understanding of the constitutive role of social practices in ongoing use and change of technologies in the workplace» (p. 404). She uses Lave's studies (1988) on «cognition in practice» to integrate the Giddens' Theory of Structuration through a «practice oriented»[3] theorical prospective. Through this integration she elaborates three new concepts: «emergent structure», «enactment» and «technology-in-practice». The concept of *emergent*

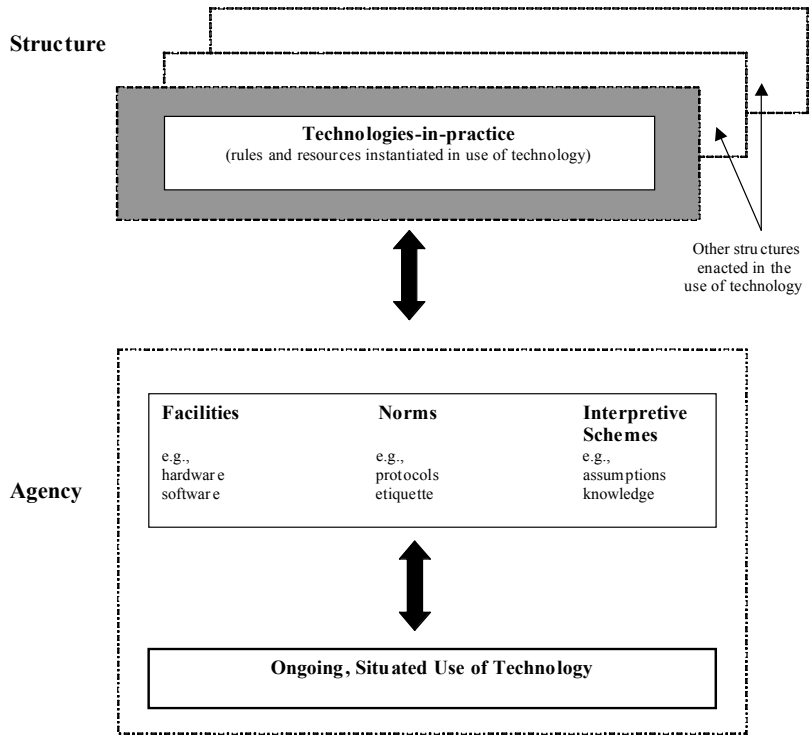
structure stresses on the «virtual» nature of the structure since it is instantiated in recurrent social practices and is not external to human action (Orlikowski, 2000, p. 407; cfr. Giddens, 1984, p. 364). Technology, especially the ICT, in itself doesn't «embody» and «stabilize» the structure[4]. In other words, the «inscriptions»[5] of the designers and developers embedded in technology don't have the power to establish and bring about the users' practices (Orlikowski, 2000, p. 406).

If one considers the structures as *emergent* and not embodied, then «an alternative view of technology use becomes possible» (*ivi*, p. 407). The concept of «user appropriation»[6] is replaced by concept of «enactment»[7]. The former refers to the ways in which people may use the structure embedded in the technology, that is when the actor uses the technology he/she chooses among a closed set of predefined possibilities. The concept of *enactment* views the use of technology as a «situated and recursive process of constitution» (*ivi*, p. 409) and the action takes part in the process of social structuration:

> … rather than starting with technology and examining how actors appropriate its embodied structures, this view starts with human action and examines how it enacts emergent structures through recurrent interaction with technologies at hand (*ivi*, p. 407).

The *technology-in-practice* points out a specific set of rules and resources - facilities, norms and interpretive schemes (see fig.1) - that people (re)constitute when interacting with technology.

Figure 1



Source: Orlikowski, 2000, p. 410, fig. 2.

The users can follow the prescriptions of designers and instantiate the structure inscripted in the artefact, but they can also ignore, contradict or reinvent those prescriptions because, according to Giddens (1984), the actor has the power to choose to do otherwise: «they may, deliberately or inadvertently, use [the technology] in ways not anticipated by developers» (Orlikowski,, p. 408). The people recursively interact with a technology and instantiate a specific *technology-in-practice*; these practices are narrowly linked to the broader process of «reinforcement»[8] or «trasformation» of the structure of the social context: «people's interaction with technology will always enact other social structure along with the technology-in-practice» (*ivi*, p. 411).

Orlikowski applies these theoretical considerations to analyze the effects – the «reinforcement» or «transformation» of social structure in the organizational contexts – of the different practices of *enactments* of one technological artefact – Lotus Notes –. She finds, in three distinct firms, six *enactments* of the same technology. To account for these six *enactments* she identifies the conditions that influence the users: interest in using the technology and interpretive, technological and institutional conditions (see tab. 1).

Table 1. Conditions and consequences associated with use of technology

Conditions before the use of technology:
• *interpretive* - «refer to the conventional understandings and shared meanings that members of a community construct to make sense of their world (including the technology they use)»; • *technological* - «refer to the technological properties (both tool and data) available to the users in their work practices; • *institutional* - «refer to social structures (normative, authoritative) that constitute part of the larger social system within which users work».
Consequeces during the use of technology
• *processual* - «refer to changes (if any) in the execution and outcome of users' work practices»; • *technological* - «refer to changes (if any) in the technological properties available to the users»; • *structural* - «refer to changes (if any) in structures that users enact as part of the larger social system in which they are participating».

She compares the conditions with the processual, technological and structural consequences of six *technology-in-practice* instantiated by users (*ivi*, pp. 412). She works out three types of *enactments* that she characterizes in terms of:

- ***Inertia*** - «where users choose to use tecnology to retain their existing way of doing things» (*ivi*, p. 421); the consequences of this *enactment* are the reinforcement and preservement of the *status quo* (*ivi,* p. 422).
- ***Application*** - «where people choose to use the new technology to augment or refine their existing ways of doing things […] with the intention of improving or enhancing their existing work processes». The consequences of this *enactment* are the reinforcement and enhancement of the *status quo* (*ivi*, pp. 422-23);

- ***Change*** **-** «where people choose to use the new technology to substantially alter their existing ways of doing things». The consequences of this *enactment* are the transformation of the *status quo* (*ibidem*).

The explanation doesn't seem to make clear the relation actor/structure. All the users can agree to choose to modify their existing ways of doing things, but it still remains to be explained 1) *why* the actors desire to change their existing ways of doing things (and why they want to change in one way and not another) and 2) *how* they succeed to fulfil their desires.

With regards to the reasons that drive the action, Orlikowski seems to claim that the agency is socially influenced because of «competitive, technological, political, cultural, and environmental influences» (p. 412), in the same page she, coherently with Gidden's perspective, recognizes a transformative skill of the actors, that are «able to do the difference» and can produce changes, but their agency is only connected with cognitive elements. For example, they choose to change if they become more knowledgeable about using their technology; more aware to use modifiable technologies or more aware that there are alternative technologies for improving economic efficiency (Orlikowski, 2000, p. 412).

With regards to the transformative capacity of the actors it seems that the *enactment* of the technology has illimited degrees of freedom from structural, cultural and technological pressures: the people choose to change and then the practice and structure also change. In the same article, she claims the *enactment* of technology is not «totally open to any and all possibilities»[9] and then she adds that «[w]hether or not the technology or the work practices are changed is often an intended outcome of people's knowledgeable actions; the structural consequences are much more likely to be unintended consequeeences of actions» (p. 421)

The two poles actor and structure don't reach an appropriate relation but they are alternately the independent variable. According to Giddens (1984) and Archer (1995)[10] to account for the case study presented in this paper we think that:

- The reasons that move the actors can be influenced by cognitive elements or environmental influences, but there are motivational elements (the sphere of desires and passions) concerning the individual personality that can move the actors to do things that seem not rational and not efficient.
- The structure, the culture and the technology constrain or enable the actor to accomplish specific practice (binds and resources); the actor by virtue of his/her «position» sustains costs or receives benefits in undertaking an alternative course of action; these costs and benefits can frustrate or reward their desires. Structure can motivate the agency too.

The relation between choice, agency and structure is often not linear and consistent; in the case study the actors choose to change their existing ways of doing things because they want to satisfy their passion (to share and to improve their knowledge) and so to want to use a

technology to change their work practice. After lots of attempts, instead, some users choose to not use the technology (failure) while others instantiate a *technology-in-practice* that reinforce the *status quo*.

The case study

From 2002 to now we are studying the introduction of a repository in an Experimental Project[11] for the recovery of *drop-outs* in the school. The data analized in this paper have been collected during a case study; the research methodology has used a plurality of techniques of investigation:

- The analysis of official documents of the project;
- The observation and video recording of all the meetings with the teacher to use the repository;
- The observation and video recording of school days;
- The analysis of the documents submitted in repository;
- A series of in-depth and unstructured discussions and interviews with the user and coordinators.

The artefact

The Repository can be seen as a system of Knowledge Sharing - informative system for the circulation and sharing of the knowledge - belonging to the domain of the Knowledge Level System the attributed function of which is «to create, to codify, to distribute and to share the knowledge between organizational actors» (Martinez, 2004, p. 132). The Repository in question is a prototype exclusively accessible through the web (being connected to an internet web site) and it allows the submitting, downloading and the sharing of digital documents (texts, images, videoclips, photos, etc.). The artifact has not only been planned for filing material that can be viewed and downloaded by whoever has access to the internet (public modality), but also to collect material (private modality) whose sharing is restricted to who possesses a personal password. During the phases of planning, the intention of the planners to stimulate the reflexivity of the potential users is affirmed. For this result, the artifact has been structured so that whoever will insert any document is compelled to fill in two completely descriptive levels useful to the operation of categorization and description of the materials. In other words, before inserting any document, it is mandatory to fill in a series of very detailed fields (description, short description, catogories, keywords, authors), a lot of which are obligatory, so avoiding superficial proceedings.

The context

The organizational structure of Experimental Project may be synthesized as following:

- three «operational groups», made up of 8 teachers and 8 social operators who closely work with about 15 *drop-outs* for testing new educational practices[12]. They are firmly hosted in different schools that are placed in the Neapolitan historical centre and in suburban districts.
- A «central coordinating» group of Experimental Project: two central coordinators, three operational group coordinators, some psychology and pedagogic scholars, educational headmasters of hosting schools. This task group 1) manages and coordinates operational groups and 2) develops and improves institutional integration and external relations.

Teachers and coordinators come from national public educational system, which are temporarily separated. Experimental Project keeps its distance from both typically Italian bureaucratic/professional setting and efficientism of the new practices encouraged by *New Public Management* (Benadusi, Serpieri, 2000); the project is conceived inside educational prospect of a fine *tuning* of *drop-out* children's needs, through the laying down of "pertaining" and contextual training strategies (Ajello, Ghione, 2000). The teachers try to exit from segmental practices of typical professional individualism (Benadusi, Consoli, 2004). The lessons are carried out by simultaneous plurality of teachers (called co-presence) and often there is participation of the whole teachering staff. At first, the co-presence has involved strong strain phases and conflict, restrained by «psycological support» and «pedagogical coordination»[13] At project level, sharing and coordinating times are far less frequent. The three operational groups meet only every quarter, during "training seminary" or meet on other public occasions.

The e nactments of the repository

Following these premises, one will start to analyse the *enactments* of Repository occurred in case study. From data collected it might observe two different types of *enactment*.

1) Repository and Reflexivity. In the first enactment the central coordination try to use the artefact to collect the "raw materials", that is the daily educational practices. These "raw materials" are the reports drawn up by teachers themselves that at turn play the observer role of their group. These reports are discussed during «psychological support» and «pedagogical coordination» meetings. The central coordination consider difficult enough both the reporting and the "raw materials" reflections. Foremost the reporting is low-grade and left property of every single community without extending to project level. Moreover, in spite of enhancements, the teachers continue to show some resistance to this work, that often is lived like an attempt to watch and control their own *expertise*.

When the coordination organizes some reunions to involve the members of the three groups in this news task, the goal of this operation is synthesized in this way: to improve the experimental character of the project, to raise the level of reflexivity of the members, to

realize the sharing of the activities and to constitute an archive from which to extrapolate the "best practices" of the project. During the reunions the teachers declare the full adhesion to such project attributing the deficit of sharing of the practices both to the excessive work loads and the lack of suitable technologies for the sharing of the knowledge. In the first reunions, the research group illustrates[14] the use of the Repository and the possibility to introduce also documents protected by a *password*. Contrarily to how much declared initially - to maximize "raw materials" sharing - some teachers and some coordinators of the groups ask the research group for separate passwords. After numerous discussions the teachers opt for one separate password for every group. They proceed in an autonomous way putting the «raw materials» in different moments. At the varied reunions, nevertheless, very similar situations are verified in the groups: every teacher tends to postpone the submitting of his/her own "raw materials" and a situation of stalemate is created since everybody waits for someone else to take the first step. The reunions, soon, become places of discussion on various matters - evaluation of the learning, of the teachers, organization of the lesson, etc. -, but it is rarely proceeded to the submission of the "raw materials". The situation becomes particularly difficult when they have to fill in the descriptive fields; teachers not succeeding in jumping the fields, since many fields are obligatory, just fill in formally these fields with extremely synthetic and not very pertinent descriptions. Two groups (group A and group B), begin to procrastinate the more and more deserted reunions. After about five months, every group introduces meaningful "raw materials" and the activity is seen by the teachers as something to escape from. So the central coordination, after having tried without success to promote other possible uses of the Repository[15], give up the activity.

2)Repository as "show case". The second *enactment* is promoted by the coordinator of the operational group C. This group has always showed a great interest and open-mindness toward the repository in comparison to the other groups. After the failure of the first *enactment*, the coordinator proposes, therefore, to the teachers and the social operators to submit all the documents that have already been prepared for other events (examinations, seminars, conferences, etc.). Through the Repository, therefore he aims to improve both the visibility of the project and the exchange knowledge with the national and international partners with which the group has worked in net for some years. The members of the group, if also in agreement, continue to complain about a work overload and to claim they cannot waste time with the use of the Repository[16]. The coordinator, after various discussions, succeeds in involving just few teachers (particularly computer science teacher) and in organizing the activity in the following way:

- the teachers have to identify and to prepare the material in electronic format (on floppy or cd).
- The definitive selection of the materials is effected with the aid of the coordinator which is seen as an important point of professional reference.
- The teachers don't insert the documents, but they deliver them to some stagists of the Faculty of Sociology. The latter, in fact, have been progressively involved by the

coordinator in the work of insertion and classification of the documents (to fill in of the two descriptive levels).

- The stagists have a lot of difficulties, because the teachers have the tendency not to furnish enough information to classify and to describe the documents; but the coordinator in the initial phase doesn't consider the operations of description very important in comparison to the process of submission.

  Shortly after the 79 documents have been inserted, the submission is suspended because two problems have arisen:
  - some documents that the group wants to submit (like the children's paper and the portfolio of the competences of the children) have a superior extension to the maximum limit allowed by the Repository.
  - Incorrect immission of the materials makes their search too complicated for the external users.

The coordinator has required therefore both a technical change (to overcome the limits of extension of the files) and the possibility to be assisted to improve the submission of the materials (classification, key words, descriptions, document forms, etc.).

Constrained desires

In the same organization, in the period of around 18 months, two separate *enactments* of a same Repository are verified. At this point it worth while to dwell on some elements to understand the results of such experience:

- the characteristics of the institutional order
- interaction between the agency and the binds and the resources of the system,
- the technology-in-practice once stabilized.

Characteristics of the institutional order of the project.

The organizational order of the project has a lot of characteristics of the configuration "Adhocratica" (Mintzberg, 1983) (tab. 2). The three operational groups are composed by teachers of different disciplines and by social operators that interact constantly together for improving the practices of recovery of the drop-outs. The typical problems of this configuration have come out: conflict (above all between teachers), ineffectiveness (endless reunions without reaching any decision) and transitions toward other organizational configurations. Currently the project is turning into a difficult hybridization with the model of bureaucracy-professional that notoriously characterizes the traditional educational organizations. The "technical nucleus" ("pedagogical coordination") and the hierarchy ("central coordination") are, in fact, very weak and little fused with the "operational nucleus"

(Meyer, Rowan, 1986), which has shattered progressively in three distinguished groups that don't maintain meaningful forms of communication and exchange to avoid new conflicts: the isolation and the individualism of the teachers, typical of the Italian educational system, has reproduced to the group level. Also the "neo-professional" culture, that should be mostly rooted in the Experiemntal Project, survives alongside a “bureaucratic” and “professional” culture[17].

Tab. 2

Institutional order of the Experimental Project
• Strain between adhocrazia and professional bureaucracy. • Compartmentization of the project and absence of cooperation among the communities. • Oscillation between neo-professional, bureaucratic and professional culture. • Tensions inside the communities.

Interaction between agency and structure in the first enactment

The members of our project practice a reflexive monitoring of their own actions that allow them, through a process of rationalization, to understand why their activities proceed in a determined way (Giddens, 1984, p.7). It is based on such monitoring that the actors understand: the limits of project (absence of suitable processes of reflection and self-evaluation), motives for such limits (excessive work loads) and the solution to these limits (the Repository). The use of the Repository is therefore interpretable as an attempt to affect reflexively on the activities and on the conditions that reproduce them, in other words, the actors choose to transform their usual way of doing the things - *enactment* for tranformation. The *enactment*, however, interact with various binds:

- **Cognitive binds**: the teachers have numerous difficulties to report and to codify the practices that are founded on tacit competences . The explicitation of such competences, besides intrinsic limits (Polany, 1958; Ryle, 1946), requires techniques and methodologies which are anything but simple (Ambrosini, Bawman 2001; Altomare, Artuso, 1997).
- **Cultural and structural binds**. The reflection on the practices is still however lived as an intrusion in the activity of the teacher. The call to the "liberty of teaching" continues to also have echoes in the Experimental Project and, in every group, the teachers continue to not make "raw materials" easily available; with this way of behaving they reaffirm one "resource of authority" (Giddens, p. 364) that derives from the bounds position to the working role acquired in the educational system and that also persists inside the project.
- **Bind linked sanction** (Giddens, p. 299). The progressive separation and independence of the three groups is by now an element acquired that furnishes the possibility to all the members to sanction whoever don't respect it. The coordination cannot intervene

directly on the didactic activities and any teacher can value the practices of other groups and, in fact, nobody asks the other groups' passwords.

The endless reunions, the separate password, the continuous procrastination the insertion of the "raw materials", the micro conflicts between teachers, the difficulties to report the expertise are the expression of practices that reproduce the existing order and particularly the settings and the results of the reunions of the pedagogic coordination and of the psychological support[18].

To justify the failure of the *enactment* through the partial limited knowledge of the actors (Giddens, 1984) would risk 1) to make a misleading equation: more knowledge = more performativity or 2) letting the actors appear as excessively incompetent. If the actor had had more comprehension of their organizational order would they have acted in another way? The motivation of the actors plays a fundamental role in this *enactment*. The motivation is not exclusively cognitive and rational (Orlikowski, 2004) – based on a positive vision of the artefact and its efficiency -, but it is linked to the need to concretize an identity very often announced and only limitedly accomplished. The enthusiasm of all increases since the Repository is seen as the «solution» from time attended for realizing those difficulty processes of self-evaluation and reflexivity that would have to represent the distinctive lines of a project: the experimentation and innovation are its peculiar and distinctive characteristic. At the end, the tendency being triggered is to abandon the project because to realize a similar objective needs a change of the structural order. Besides such a change cannot neglect that the project has a strong interorganizational connection with the Municipality of Naples and the National educational System from which it receives the necessary resources for its survival.

TAB. 3. the first *enactment*: submitting «raw materials» of the Experimental Project

<table>
<tr><td colspan="3">• Strain between adhocrazia and professional bureaucracy.
• Compartmentization of the project and absence of cooperation among the communities.
• Oscillation between neo-professional, bureaucratic and professional culture.
• Tensions inside the communities.</td><td>Structures</td></tr>
<tr><td colspan="3">Strong motivation of all the members of the project that desire to modify the usual way to do the things, since it results too far from their beginning ideal, that has constituted the fundamental motive for which the teachers have stuck to the project, also not receiving any additional salary in comparison to one standard. Such need seems to dim the binds which are adequately known and that don't delay in revealing themselves. The final option will be to abandon the assumed avail of the technology.</td><td>Agency</td></tr>
<tr><td colspan="4">Type of Technology-in-practice: very limited use of the technology-in-practice</td></tr>
<tr><td>Resources</td><td>Norms</td><td colspan="2">Interpretative schemes</td></tr>
<tr><td>• Very scant exploitation of</td><td>• «raw materials» have to be inserted only in</td><td colspan="2">• Use of the Repository requires a professional job on the expertise</td></tr>
</table>

Repository • The two descriptive levels are only formally filled in.	"private" modality. • Every group owns a different Password	(tacit knowledge) which is too difficult. • The Repository has to be used providing that other colleagues will also make it. • The use of the Repository could let the conflict (group A and B) increase.

Interaction between agency and structure in the second enactment.

With the second *enactment* the coordinator of the group C tries to improve personal visibility and of his group. Such *enactment* doesn't interact with the binds that we have above mentioned since it has not turned out the ordinary way to do the things, only but it enhanced the publicizing and diffusion of the activities - *enactment* to reinforce -.

- **Low level of reflexivity**. The teachers don't elaborate the documents. The latters can be considered like the «best practices» of group already drawn up for other occasions (conferences, formations, seminars, etc.), they don't concern the expertise of the teachers, but concern mainly the jobs of the children. The use of the Repository has not modified the levels of reflexivity and self-analysis of the operational group.
- **Low work loads**. In the group only few members use the Repository. besides the coordinator succeeds in reducing their initial job delegating the insertion of the documents. The process of submission will be so cheap since the coordinator gives the maximum priority to the quantity of the insertions. The high number of submissions will be seen then by the teachers as a motive for pride that will push them to intervene to improve the descriptions.
- **Reduction of the occasions of conflict**. The coordinator modifies the vision from the beginning associated to the Repository, that is a shared use that involves all the teachers. The Repository will be used only in his group and only by some teachers. The coordinator, besides, in virtue of his recognized pedagogic and didactic knowledge, is seen as a competent member of the community and he participates in the selection of the documents.

In this case, the coordinator sees the repository only as a showcase above all to increase the legitimacy of the project that doesn't go in contradiction with the going order, but that reproduces it. The coordinator is very motivated because from time he is trying to affirm his professional figure and to increase his authoritativeness and visibility both to the inside and to the outside of the Project. He also understands the state of mind of his teachers and their demotivations. due to this, in the initial phase, will involve them very limitedly.

TAB. 4 *The second enactment: submitting «best practice» of the group C*

• Strain between adhocrazia and professional bureaucracy. • Compartmentization of the project and absence of cooperation among the communities. • Oscillation between neo-professional, bureaucratic and professional culture. • Tensions inside the communities.	**structure**
The coordinator is motivated because he wants to publicize and to legitimate his group. He knows the problems that have been verified in the first *enactment* so involves only few teachers and requires they submit the already prepared material for other events.	**agency**

Type of **Technology-in-practice**: delegated use of Repository		
Resources	Norms	Interpretative schemes
• availability of few teachers • insertion to delegated stagistis • described levels filled in with cheap information	• the coordinator has to approve the documents to insert • introduce only documents for external users • deliver the documents to stagistis	• Repository is an useful showcase to increase visibility (also towards the other groups) • the Repository can be used only by one operational group

Conclusions

The institutional order of the Experimental Project is not constituted by a coherent and stable set of rules and resources, but shows inconsistent and in continuous tension aspects. The members of the project attempt both to be legitimated by the educational system and to realize allomorphic practices. The outcome is a permanent tension: to be recognized and to receive permanent resources from the educational institution and to be different from the latter. The project seems therefore to evolve toward a more isomorphic order to the traditional educational system. So, the most important thing, that is it "betrays" the initial desires. All this brings about a "stable oscillation" between alternative logics without arriving at an arrangement that privileges a logic rather than another. In the project there are various practices that instantiate contrasted rules and resources.

Tab. 5

Conflict inside institutional context between contradictory tendencies	
Experimental logic	Legitimization logic
• organizational configuration: "adhocrazia", • neo-professional culture, • inside tensions and conflicts intra and inter-groups. • experimentation (pedagogic coordination,	• organizational configuration: "professional-bureaucracy", • bureaucratic and professional culture • Compartmentization of the project and absence of interaction among the

psychologic support) • tacit knowledge and constant improvisation.	community. • Institutionalization of the knowledges (best practices)

To understand such a conflictual situation we have to take into account both the external influences (the inter-institutional relationships) and the inside impulses (the actors' motivations: passions and desires) that are reflected also upon uses of the Repository. In reference to the external influences, the national educational system funds this experimental project (partially financed by the Municipality of Naples that remunerates the psychologists and the hosting schools) furnishing some strategic resources, *e.g.* the teachers. The funds are limited and the educational system ignores the outcomes of the experimentation: there are not effective processes of evaluation of the new pedagogic practices; nor basic procedure to transfer the *expertise* of the teachers. The monitoring by didactic/pedagogic expertise, maybe the most strategic resource, is left to occasional collaborations without systematicity and constancy. The project remains of reduced dimensions and with a temporary character. The coordination, to make its own experience more stable, tries also the way of the isomorphism: from one side, it seeks to identify the «best practices» to increase the legitimacy of project, through an institutionalized model, from the other, it begins to get resources participating to other "strong institutional" projects (*e.g.* the OFIS - offered formative integrated experimental). Such new activities will "betray" the starting presuppositions of the project (passion for experimentation); the groups, in fact, begin to move with more and more separateness, and they lower the level of experimentation and innovation of the practices.

In reference to the matter of the influences from inside (the actors' motivation) the first *enactment* can be interpreted as an attempt of transformation of the *status quo* because it privileges "reflexive" logic against one of the "legitimation" (tab. 5). Such *enactment* however is constrained by binds that have settled definitely: division between the groups and low grade of reflexivity upon the experimentation. These binds influence, rather than determine, the agency or rewarding or frustrating the choices of the actors that, once appraised the situation, think it more convenient to abandon the Repository. The Repository had catalyzed old passion to which all the components are deeply bound and that have influenced them to conceive or to participate in the project. Moreover the rhetorics associated with the power of the new technologies (Butera, 2003, p. 31; Landri, 2004, p. 2) captivate the members of the project that more firmly believe in these new and sophisticated tools. The actors charge the Repository of numerous expectations so much that they end up not considering the structural elements that have always bound their passion for experimentation.

The second *enactment* doesn't affect the contradictions of the context since it complies with the situation leaving it unchanged: one group is involved and many members don't participate in the activities, while others offer a very limited contribution. The technology-in-practice of the second *enactment* can be seen as an unintentional effect of the first *enactment* (Giddens, 1984). The coordination and the teachers choose to use the Repository to share the

knowledges and to improve the reflexivity upon the experimentation, but the winning technology-in-practice strengthens a logic of separation and institutionalization.

Finally, at the analytical levels it's possibile to draw following summary:

1. *Social Actors'level*. Orlikowski's analysis recognizes a transformative skill of the actors, they are «able to do the difference» and to produce changes, but their agency is only connected with cognitive elements. A deeper analysis could show the importance of their desires and passions that move their courses of action (Archer, 1995).
2. *Constraints of the institutional context*. The concept of the *enactement* puts the role of actors at the centre of the analysis to consider how he/she «enacts emergent structures through recurrent interaction with the technology at hand» (Orlikowski 2000). With such a hypothesis, an almost direct relation is established between «reflective» and «wellinformed» actors'goals, changes in practices and the subsequent modification of the institutional aspect; but, in such a way, not only the unintended effects are cancelled, but the actors also seem to be able to annul the power inscribed in the technological objects and the institutional constraints (Giddens, 1984). The concepts of «position», particularly, highlights the costs and benefits in undertaking an alternative course of action (Archer, 1995)

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[2] Various scholars have drawn upon TS to address technology question (Barley, 1986; Orlikowski, 1992; DeSantics, Poole 1994). According to Orlikowski these scholars, since theoretical deficits left by Giddens about this issue, have drawn upon social constructivism (CS). This merging between TS and CS has shown «some difficulties» to analyze the innovations both of the technological artefacts and the several uses of technology in ways not anticipated by the developers (Orlikowski, 2004, p. 405).

[3] Lave, with Wenger, is the author of «community of practice» theory (1991), that form, full fledged, part of (Nicolini, Gherardi, Yanow, 2003) socalled «practice turn» (Schatzki, Knorr Cetina, von Savigny, 2001). The invariant element of wich is «a distinct social ontology: the social is a field of embodied, materially interwoven practices centrally organized around shared practical understandings» (Schatzki, 2001, p. 3)

[4] The «emergent structure» is in contrast with «embodied structure». This latter may slide towards realist and essentialist views (see Orlikowski,1992; DeSantics, Poole 199 4).

[5] The concept of «inscription» in refered to Latour's studies (Orlikowski, 2000, p. 405).

[6] see DeSantic, Poole (1994), Orlikowski, Robey (1991).

[7] «The notion of enactment used here is related to but broader than that given currency by Weick (1979). It is intended here in the conventional sense of "to constitute, actuate, perform" (Oxford English Dictionary) or "to represent in or translate to human action" (Merriam-Webster Dictionary)» (Orlikowski, 2000, p. 425 n. 2).

[8] Orlikowski highlights how much the stabilization is only an artifice since social structure and, thus, also the technology-in-practice, is not indipendent from practice: «[t]he practice lens elaborated here recognizes that even as technologies-in-practice may become institutionalized over time, this is only a stabilization for now. […] Such practice lens recognizes that emergence and impermanence are inherent in social structure» (2004, p. 412).

[9] There are a lots of limits as «the physical properties of artefacts», the standards necessary to interact in global network and in general the «[u]se of technology is strongly influenced by users' understandings of the properties and functionality of technology, and these are strongly influenced by the images, descriptions, rhetorics, ideologies, and demonstrations, presented by intermediaries such as vendors, journalists, consultants, champions, trainers, managers, and "power" users» (Orlikowski, 2000, p. 409)

[10] Both authors have a stratified conception of individuals (person-agent-actor in Archer; self-mornitoring, razionalization and motivation in Giddens) interacting with social (organizational) structures (structure and culture in Archer; rules and resourses in Giddens). Notwithstanding the different ontologies and methodologies of these two theories we think that there are some common elements (Bortolini, Donati, 1999) that make their integration possibile and useful.

[11] The project was born five years ago and is funded yearly with funds of the Law 285/97, of the Municipality of Naples and by the national educational system.

[12] The aim of the experimentation is to produce new didactic practices for the socio-educative recovery of the children that have not accomplished the compulsory education.

[13] The group of psychological support (thanks to the collaboration with an university department) furnishes a psychological support to the teachers about the relational dynamics; the pedagogic group is interested, instead, to sustain the experimentation and the didactic innovation. Every group gathers every two weeks and all the teachers and the social operators participate to it.

[14] Some coordinators already knew the Repositroy because they had participated in the preceding phases of the planning of the artefact.

[15] Particularly, the central coordination tries to use the Repository to insert the "best practices" of the Project (an activity that apparently seemed simpler because it didn't involve the teachers directly). After a new phase of stalemate, to avoid new conflicts - such activity lets emerge and sharpen the inside strains in the coordination – the use of the Repository is abandoned definitely.

[16] This enactment starts two months from the failure of the first enactment, therefore the climate is very strained and some teacher associate to the Repository a source of stress.

[17] For "neo-professional" culture we intend a product of values and orientations in which the specific demands of the pupils are central to individualize the separate interventions independently from the adherence to the norms (burocratism) or from the economic demands of the system (new public managment). Besides, such

culture is estranged by a individualist vision of the profession teacher (professionalism) since it is promoting a cooperative and partecipative orientation (Romano, Serpieri, 2004).

[18] The pedagogical coordination has notable difficulties to address pedagogic and didactic matters. By now the reunions deal just with problematic daily episodes from psychological, emotional and relational aspect.

Does Measuring Learning Prevent New Knowledge?

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Abstract

This paper will demonstrate that the desire found within many organisations to measure the learning being undertaken can undermine the ability to develop new knowledge. The reasons for this are cited as the potential impact of mental models as closing mechanisms, coupled with the likely affect that this will have upon the dominant coalition. This propensity is seen to become more likely because of the way that organisations routinely support learning via targets, appraisals and objective setting which will all be framed from within the current mental models. The paper concludes by considering future ways of measuring that might not close down knowledge development, but could even encourage it.

Introduction

It is a widely held view that, in the future, the most important contributor to corporate competitiveness will be the ability of one company to learn faster than others (Altman and Iles, 1998; Pemberton and Stonehouse, 2000; Senge, 1990); as a result, companies may seek to become learning organisations in order to increase new knowledge development and knowledge utilisation which will lead to competitive advantage (de Geus, 1997) and transformational change (Pedler et al., 1989; Senge, 1990). It follows that, in order to benefit from the knowledge being developed within it, an organisation must know that learning is occurring and that the knowledge it is looking for is emerging. Without this ability to use the knowledge, there can be no change. However, few of the writers on organisational learning or the learning organisation models discuss how they will ensure that they are creating and utilising useful knowledge.

An overview of the learning organisation literature demonstrates that some models have elements of ongoing feedback and review which might give this confidence (see for example Pedler et al., 1989 and Garvin, 1993) but, because the review is triggered by a problem or behaviour linked to current policies and past experiences, the certainty of usefulness of knowledge becomes problematic (Blackman et al., 2004). The models encourage organisations to learn from experience, but how they are to ensure that the meanings created will reflect the right perspective and, therefore, provide the acquisition of useful knowledge is not obvious. However, what is made clear is that successful companies will be those who 'actively manage the learning process to ensure that it occurs by design rather than by chance' (Garvin, 1993, p.81).

It is this act of managing the learning process that will be the focus of this paper. In order to ensure that learning is occurring, many organisations will want to identify ways of measuring potential changes (Watkins and Marsick, 1993; Dobson and Tosh, 1999). Such measurement is seen as a way to encourage, measure and reward desired learning behaviours and, it is argued, ensure that such new behaviours will develop in an ongoing way. It could be

posited, however, that as rewarding a behaviour will ensure the repetition of such a behaviour (Robbins, 2000; Thorpe and Homan, 2000; Le Boeuf, 1986), if the wrong thing is measured it will encourage inappropriate learning behaviours. This paper will discuss ways which are used to measure potential learning, thereby considering whether the impact of such measurement systems achieves the desired output of increased organisational knowledge development and utilisation.

Measurement as an element of a learning organisation

Learning organisations continually strive to improve and transform themselves, not merely make incremental adjustments (Pedler et al., 1989; McGill et al., 1992). They are organisations which seek to improve their effectiveness through reflection, innovation, continuous evaluation, quality improvement and timely responses to their internal and external environments (Pearn et al., 1995). Their advantage has been seen to be the development and harnessing of new knowledge, developed via managed learning processes (Pedler et al., 1989; Carr, 1997; Ill et al., 2000; Flood, 1999). Pedler et al. (1989) defined ten key steps to becoming a learning company and Senge (1990) outlined five key disciplines which were the underpinning principles of developing a learning organisation. What has been written since (see for example: Goh, 1998; Holt et al., 2000; Dobson and Tosh, 1999; Dowd, 2000; Watkins and Marsick, 1993; Wishart et al., 1996) is largely based upon these initial writings.

An analysis of the literature identifies a set of theoretical elements which are argued as being needed to become a learning organisation (Blackman, 2002). Two types of input changes can be identified as being needed to develop the desired output changes: firstly, organisational inputs designed to develop individual learning and, secondly, specific learning organisation behaviours that will support the sharing of the individual developments.

The learning organisation literature was reviewed and a summary model was developed of the inputs which included the element 'Enable Continuous, Monitored Learning Opportunities' (sourced from, amongst others: Clegg, 1999; Popper and Lipshitz, 2000; Grieves, 2000; Griego et al., 2000; Snell, 2001) see figure 1. This is seen as a process whereby learning systems can be planned in such a way as to ensure learning development. Effort is spent on defining and measuring key factors when venturing into new areas, which leads to organisations seeking quantifiable measures of learning in order to support systems and reward learning. These inputs and outputs can be summarised as an input/output model that will lead to new knowledge creating transformational change and competitive advantage (figure 1).

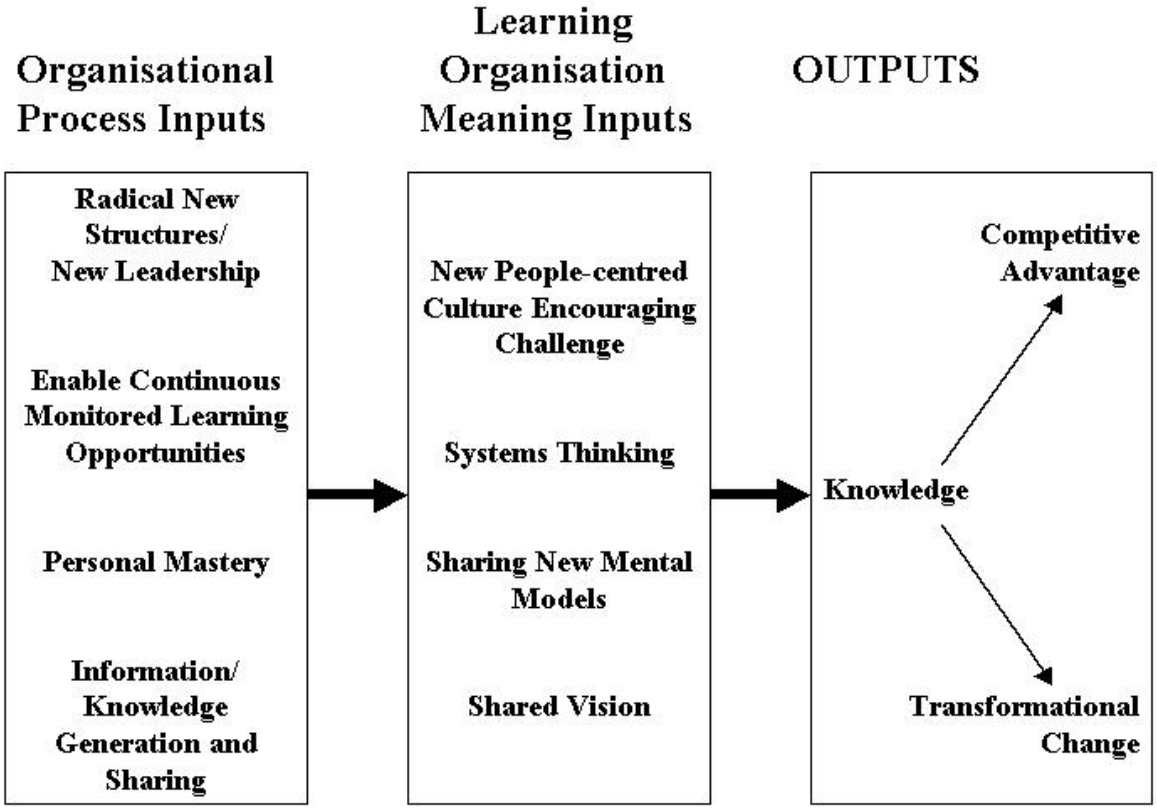

FIGURE 1. *An Input/Output Model of the Learning Organisation. Source: Blackman, 2002*

Many of these behaviours are about ensuring that learning is developed, supported and communicated and are specifically designed to try to overcome some of the potential problems identified as preventing organisational learning. It is widely accepted that organisational learning is limited by a lack of shared language, values, knowledge and understanding (Easterby-Smith et al., 1999). Consequently, sharing mental models is recommended for both organisations and individuals to create shared meaning, thereby enabling common understandings and a development of knowledge (Hayes and Allison, 1998; Bell et al., 2002; Senge, 1990). Dixon states that 'it is this joint construction of meaning that is organizational learning' (1997, 25).

Organisational mental models provide collective frameworks of value and belief systems which act as the basis for analysis, policy and procedural and cultural development (Caldwell et al., 2002); they are cited as providing the link between collectives and individuals as they proffer a context for the interpretation and understanding of new information (Kim, 1993; Doyle Conner et al., 1994; Dixon, 1997; Swaab et al., 2002). It is, therefore, argued that all new knowledge develops from the basis of the mental models in place. For these reasons the development and sharing of mental models is seen as a very important element in developing a learning organisation (Senge, 1990; Pedler et al., 1989; Dovey, 1997; Clute, 1999). Mental

models become the bounded rationality of individuals or, collectively, teams, communities of practice or organisations (Simon, 1991). Actions emerge as a result of the mental models currently held. The role of mental models is, therefore, significant; their advantage is held to be an element of predictability which can develop as a result of the models held (Wetzel and Buch, 2000), but this can become a problem as flexibility and adaptability can be reduced (Hill and Levenhagen, 1995).

When one analyses the potential results of sharing mental models it is possible that, instead of aiding organisational learning, they may in fact hinder it. The concept of a mental model as a framework for new knowledge means that it could also act as a closing mechanism. Blackman (2001) and Coopey (1996) have demonstrated that, through dominant logic and coalitions, new knowledge creation can become self-referential in nature, leading to only some ideas (those related to the current mental model) being acceptable to the system for consideration. The stronger the mental model, the greater the influence it has upon the state of openness of the system. In extreme cases, the flow of knowledge acquisition can be completely turned around with only ideas which have been actively sought out by members of the system being recognised and encouraged (Blackman, 2001). It can then be seen that this prospect of organisational closure may have the potential to affect the success of measurement within an organisation.

Garvin (1993) stressed the need for measurement designed to ensure that an organisation could see when its move towards being a learning organisation was working since, by measuring the learning inputs it should be possible to recognize when desired the outputs are being achieved. This need to track achievement is important within organisations in general, thus many organisations, when trying to become learning organisations, set about targeting new ideas and setting up development systems that will enable a more group feel and culture to emerge (Arkin, 1993; Nevis et al., 1995; Dobson and Tosh, 1999; Tosey and Smith, 1999; Buckler, 1998): for example 'Desired outcomes from the workshop were articulated as interlinked themes' (Attwood and Beer, 1988, p.205). There is also considerable focus on management by objectives in many schemes (Arkin, 1993). The need for measurement drives the learning organisation towards monitoring and evaluating the learning process.

Kock et al. (1996) feel that the focus on organisational learning produces the myth that all organisations should be learning systems and, consequently, organisations seek to learn even when they do not need to. One of the mistaken targets may actually be to have more learning, not to use more knowledge. How you categorise and measure something depends on how you look at it and what you are differentiating it from. Since there are so many different ontologies of organizational learning, the more one sets out to measure precisely its nature and extent, the more one is likely to fall into what Ryle (1949) calls a 'category mistake'. '…there is much danger of methods based on one set of assumptions being applied to a model of organizational learning based on a wholly different set of assumptions' (Easterby-Smith et al., 1998, p.267.) For example, when Iles (1994) suggests the use of competences, there seem to be two potential problems. Firstly, who defines the competences and do they know what

they are looking for? Secondly, as they are framed by the current mental models and are, therefore, couched in the same language and understanding as other current organisational processes, how can they be as radical and different as some others imply processes must be, if they are to transform the organisation? It is this potential for the way that learning is measured to actively reduce both organisational flexibility and the effectiveness of organisational learning and knowledge development, that will be explored within this paper.

Methodology

There are many different views of what organisational learning is and how it comes about, but most writers are in agreement that, as a result of the learning, something within the organisation changes (Blackman, 2001). It is this change that the learning organisation is attempting to harness in order to achieve competitive advantage. The methodology chosen for this research set out to explore differences created by learning organisation processes, focussing upon identifying knowledge output differences between learning and non-learning organisations. The objective was to consider the elements that were being used to develop and sustain learning (including the element of measurement) in each case and to analyse differences, in order to demonstrate how developing learning systems was leading to improved performance and competitive advantage. Such research clearly needed a depth of data and analysis rather than breadth. This could only be achieved with methods that would permit exploration and theory building (Creswell, 1994), rather than looking for confirmatory data and so four qualitative case studies were developed in the UK. The profile of the four was two companies that considered themselves to be learning organisations and two who did not. The first two companies, who were widely acclaimed for their learning organisation status, focussed internally upon identifying and sustaining this status. For the two that were non-learning organisations, one had heard of the concept but made no claims to even try to achieve such a status. The other had never heard of such an idea and, when it was discussed, was very clear that such definitions did not reflect their processes and practices. All four were Public Limited Companies of a similar size and all were based on single sites. The sample was seen to be of two pairs of companies. One pair were production companies, one a learning organisation (Company 4) and one not (Company 1), and the other pair were service companies, again one a learning organisation (Company 2) and one not (Company 3). All four are considered to be successful – this is measured as making a profit and achieving company goals.

Data was collected in three ways. Firstly, via samples of organisational literature and documentation seeking to understand the organisations own views of their learning and knowledge development practices. Secondly, via open-ended questionnaires exploring differences in perceptions and understanding between the organisations pertaining to knowledge, learning, culture, the nature of organisations and the role of information. 82 questionnaires were returned giving a return of between 20 and 34 percent for each company.

There were equal returns for learning and non-learning organisations. Thirdly, via qualitative interviewing of 36 individuals throughout the organisations (senior managers, supervisors and line employees) which was 10 percent of all staff for each case. The questions sought participant's views on what is knowledge, what is learning and explored views on the status of inputs outlined in figure 1.

Subsequently, a second study has been undertaken which sought to explore how learning and knowledge were being encouraged in companies within the Western Sydney area. The objectives of the study were: to understand how organisations prepare for and meet the challenges of an increasingly complex, competitive and globalised world; to understand how organisations prepare their members for these challenges and to compile an inventory of key enablers and barriers to learning organisation development. Because it was determined that there was a need to understand the nature of the problem being researched and the cognitive structures within the organisations, a qualitative approach was adopted (Creswell, 1994).

Data was collected from eleven case companies ranging in size from 5 to 4000 employees (although this large company is split into divisions and only one product and area were researched), of which some were owner run and managed, whilst others were major corporations. It was the location of the companies that was of initial interest in order to consider how learning and knowledge were being developed in Western Sydney, Australia. Accordingly the sample was mixed, as it was thought that different patterns might emerge in different sizes and types of company and that such differences could then be explored. Interestingly, however, the patterns were very similar across all the organisations. In order to get as broad an understanding as possible of a range of voices the method was designed to get a picture of the views held throughout the organisation. Semi-structured interviews were undertaken with employees from differing levels within the companies and some focus groups were also undertaken in order to consider if discourse changed when employees were in groups rather than being interviewed differently. The data was then entered into NVIVO and coded for themes.

Findings

There was a clear set of common themes running within all four companies from the first study when it came to enabling continuous monitored learning opportunities. These were categorised into appraisal, objective setting and targeting knowledge. When the data from the second study was analysed, it became clear that the companies in this study were also focussing upon appraisal and management development as their methods for learning and knowledge development. Despite a lapse in time (4 years) and a difference in location (UK versus Australia) the methods being used to support and enable learning had no noticeable differences between them.

Appraisal

All the companies had a form of performance appraisal, which led to the output of a training and development schedule. What was of interest was that, whilst all the companies were trying to develop knowledge and skill enhancements via appraisal, all were also using it to enable the measurement of learning within the companies. The learning organisations had more complex and quantified methods for measuring the learning taking place, however, there was little evidence that this was being translated into new, different knowledge. This seemed to be because of the way that the appraisals were being managed which was very much about objective setting of learning inputs rather than the measurement of new knowledge outputs (see below): there was an implication that by measuring something such as a course this would ensure a knowledge output: *"Need to measure the output of training – how done best – measurement of qualifications is a good way"*[company 2, project 1].

Another concern was that the use of appraisals was leading to the organisation determining what should be learnt. Both company 2 and company 4 (those considering themselves to be learning organisations) were very focussed upon linking the appraisals and personal development plans to the organisational objectives. This led to comments such as *"I will get support to go on training but I will always have to show how it will be directly related to my work"*[company 4, project 1]*; "It is all competency based – assess needs first and then find out what is available ... As needs are assessed against the competencies it gives focus to progress and is good for discussion"* [company 2, project 1]; *"I like the idea of everyone having learning targets* [as a part of appraisal review] - *we are nowhere near this yet but it's on the agenda. People will have ownership of their own jobs and, therefore, their own learning. We have a long way to go"* [company 3, project 1].

If we consider the concern of self-referentiality indicated earlier it can be seen that the organisation may be pre-determining what is learnt which could lead to new ideas in the environment being lost or ignored (Blackman, 2001). Issues of power may emphasise these concerns, as power can be seen potentially to detract from the free and open exchange of ideas (Coopey, 1995; Blackman, 2001). The concern is that the organisation is more powerful than the individual, thus what the organisation determines as important will take precedence of any other issues the individual may notice. There is a strong possibility that the organisational mental models will pre-empt all new learning

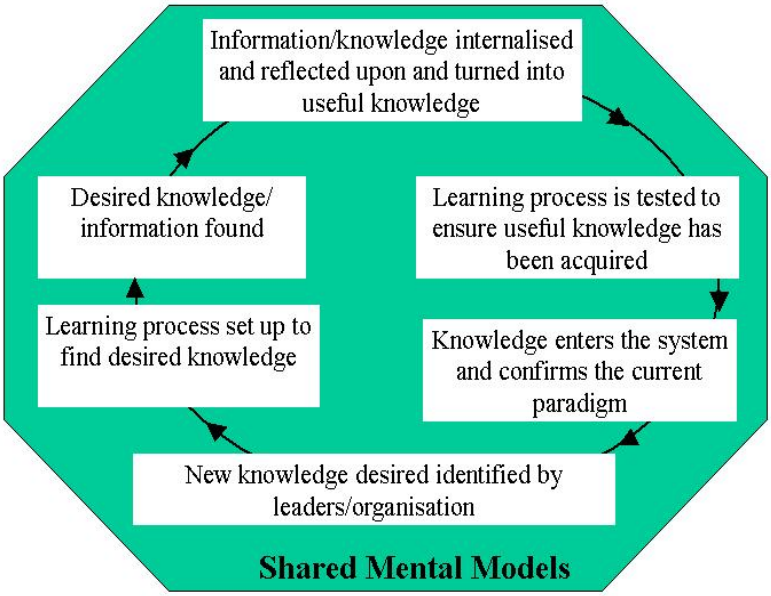

FIGURE 2. *How Organisational Mental Models Frame Knowledge Generation and Sharing*

Figure 2 indicates a turning around of the traditional knowledge acquisition flow and what can be seen is that the current mental models will act as the filters determining what will need to be learnt. Everything about the learning processes set up within the companies studied is designed to ensure that the organisations are seen to learn, but not to ensure that the knowledge will be useful, challenging or develop new mental models. The effectiveness of the processes will always depend upon what are the mental models held; if the leaders hold a truly visionary perspective and this drives the learning, then there will be changes. If, however, the leaders do not set up the necessary tensions, since current operational issues are driving the shared mental models, really new ideas and knowledge will not develop.

Objective Setting

The use of measurements included objective setting which incorporated fixed numbers of training days and encouragement to attend regular staff development leading to agreed qualifications, were limiting the range of new ideas entering the organisational decision-making frameworks. Problems with measuring development have been documented previously (Kirkpatrick, 1998; Phillips, 1999), showing that unless measurement is specifically designed to encourage higher level learning, it tends merely to audit lower level knowledge and this was what was occurring. The levels of learning were analysed across all four companies and, despite the companies considering themselves to be learning organisations being very focussed upon clear objectives the levels of learning being demonstrated were not very different.

Pffeffer and Sutton (1999) also stress this need to develop further than know-how, as the possession of apparently tangible knowledge leads to a belief that it is used, and will be used, appropriately and efficiently. They say that 'why' before 'how' is crucial to the success of any knowledge development within organisations. Clegg also stresses the need for a process to develop knowledge as more important than clear outputs (1999). Edmondson and Moingeon (1996) also differentiate between 'how' and 'why' and, whilst they state that both are important to the long-term success of an organisation, they stress that competitive advantage is more likely to be found by developing know-why.

The short answer question data from project 1 was coded so that 'knowing how' was seen as 'acts' – individuals know how something is done and based on received ideas actions can be performed well. Everything is explicit and can be observed. This was seen as equating to basic training, behavioural outputs, being based upon information and direct short-term measurement is possible. Where answers focussed on processes for training, NVQ measurement etc., this was seen to reflect the explicit observable nature of the knowledge. 'Knowing-that' was where there appeared to be a recognition that something needs to be done in a certain way. There is a basic, skills level of understanding and some tacit issues are now perceived. The perception that there needs to be some cognitive underpinning is key here. Lastly, 'knowing why' was seen to be when individuals understood why something had to be done, what the options were, when concepts were understood and when there was recognition not only that this is the reason for something but also why something else was not.

Table 1. *Know That/How/Why*

Type of Knowledge	Hits for LO (%)	Hits for non LO (%)	Total (%)
That	24 (18%)	27 (20%)	51 (38%)
How	31 (23%)	30 (22%)	61 (45%)
Why	14 (10%)	10 (7%)	24 (17%)
Total Entries Coded	70 (51%)	67 (49%)	136 (100%)

TABLE 1. *Results of types of knowledge*

What is immediately obvious once more is the similarity of the responses between the types of organisations. It is also clear that this analysis confirms the low incidence of linking knowledge with understanding (24% of 'know why' overall). The focus is upon skills and information acquisition rather than cognitive and understanding abilities. The implications of this are that there will be more effort put into gaining more information but not necessarily in developing people to be able to use the knowledge. The focus upon learning will be on acquiring information, not upon cognitive development. When companies are looking to see if they have acquired knowledge they will be looking for evidence of more facts present but not necessarily new ways of thinking. Measurement systems will be looking for explicit examples of knowledge rather than more ephemeral concepts. This data from the short answer questions

was corroborated by the interviews in both projects which, as indicated above, focussed upon competencies and skills rather than challenge and change. The implication is that the measurement will encourage lower levels of knowledge, thereby actively reducing the potential for new knowledge to lead to transformational change.

Targeting and Rewarding Knowledge Development

The learning organisations were targeting knowledge in order to be able to recognise and measure it. The idea of targeting is recommended in some models (see for example: Nevis et al., 1995; Tosey and Smith, 1999) but, by its very nature, targeted knowledge has to be clearly defined before it has been acquired and thus is more likely to be simple in order to be easily measured.

The problem with implementing reward processes successfully is that there has to be some form of measurement if performance is to be changed – this is so that the desired behaviour can be rewarded and encouraged (Robbins, 2000; Thorpe and Homan, 2000). The measurements needed if there are to be visible incentives, will drive behaviour more than the desire to achieve the outputs. An example of this was seen in company 3, where many were encouraged to attend training/conferences and other forms of development. However, there was no system for feeding this new knowledge into the organisation. The money was in place and, therefore, the behaviour of discovering new ideas was actively followed, but, in fact, the organisation did not benefit from this. Moreover, in company 4 the measurement of learning was equated to qualifications and so everyone received a bonus upon completing a qualification. Again, there was no measure as to what was really being fed into the company and the debate must be whether, having everyone achieving the same qualifications as each other is helping, or is it in fact merely closing down the company still further as the process of acquiring the same qualification will develop strongly shared models. In all four companies, learning targets (the measurements) were set by appraisal, thus the shared mental models drove the new learning. This was then reflected by the rewards processes and thus the reward structure added to the propensity for closure.

There is also cause for concern here as to how this response to measurement affects, and is affected by, the dominant coalition within organisations. Kofman and Senge state that a learning organisation can aid creativity and development as it focusses on the organisation itself and reduces the 'race' against the competition (1993, p.9). Yet, if the desired output is seen to be new ideas and change, this is what will probably occur, because management will assume that the measurement of success will be change - whether it is the right one may not be seen as the issue. The competition is now amongst the managers to 'learn' more than their colleagues so that they can change things faster. Competition is part of the learned behaviour already in place which will take a great deal of eradication, owing to the constant focus on short-term gain. Thus, it becomes possible that the key factor is to achieve learning, via measurement techniques such as monitoring qualifications, not necessarily to achieve new

knowledge. One could argue that this is the focus of figure 1, but it is clear within the model that the learning needs to cultivate knowledge, but there is no evidence that these were the outputs developing.

Learning is being predetermined by the use of learning targets, measurement and appraisals. It can be seen that the current mental models held within an organisation, especially those held by senior management, drive this pre-determination. The shared or dominant mental models construct the learning measurements and drive the learning processes and knowledge development. Consequently, the idea of an open system acquiring ideas from the outside, itself becomes seriously challenged. Without this openness, the usefulness of learning becomes more problematic, because only if there are divergent mental models can the differences and tensions emerge which will generate learning.

If figure 1 is redrawn it can be seen that, because of the fact that knowledge is being pre-determined by the managers, by the systems and by what is already known, the role of mental models in knowledge creation (via the choices of measurement) will be quite different from that implied in figure 1. In figure3 the inputs are re-drawn to reflect what is really happening because of the mental models and their impacts upon measurement and learning process development.

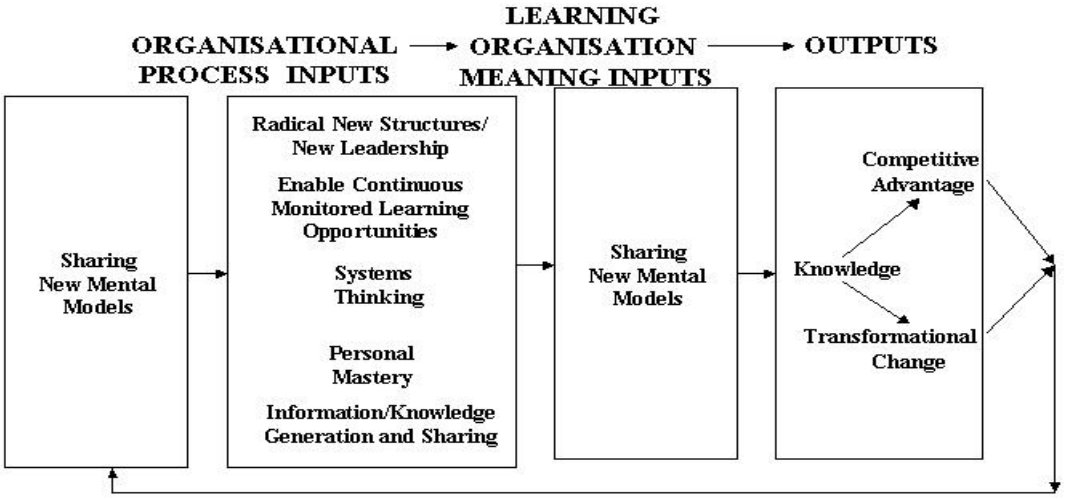

FIGURE 3. *The learning organisation model reflecting the impacts of shared mental models.*

Culture is no longer shown as this will be determined by the mental models (the stronger the shared models become the more they will determine the culture and its impacts. The other elements are being predetermined by what is already known and understood. The more

measurement is used as a way of ascertaining the state of learning, the more likely it is that it will reduce the levels of novelty and innovation that are emerging form the learning processes.

Alternative perspectives on measurement

The concern is shown that setting up measured and monitored learning opportunities in order to set up a new learning culture can be seen to be flawed as, although the inputs being measured may appear to be likely to develop the desired outputs, in the cases we have studied, in both projects 1 and 2 the actual knowledge outputs do not seem to be measured in a meaningful way. This concern is not new, much training literature vindicates the view that evaluation systems of development ands training are sadly lacking (Potter et al., 2003; Davis et al., 2003). The last section of the paper will develop some theoretically formed alternatives for measurement, based upon research currently in progress (project 2). It will be shown that, rather than measuring learning targets and knowledge gained, there needs to be a change to measure the organisational propensity to learn and the range and types of knowledge that are in place.

There needs to be a different way of considering how to measure learning in a way that will not prevent the creation and acquisition of new knowledge. Building upon what has been said before, it can be seen that the measurement system would need to be designed to develop and reward alternative behaviours. These behaviours would need to encourage: a recognition of the knowledge being created by the learning; the maintenance of more open systems; higher levels of 'know why' knowledge; the transfer of knowledge to others within the organisation and ongoing recognition about what the learning is actually desired to achieve in terms of the outputs of the processes being undertaken. It could be argued that what is needed is a change in the conceptualization of what a learning culture is for: instead of expecting it to encourage more learning, it needs to encourage more knowledge creation in order to enable transformation. If this is so, then a reconceptualisation of the role of culture in learning organisations models can be proposed to be one of challenge and not of learning, then a reconceptualisation of figure 1 will also need to be considered – see figure 4.

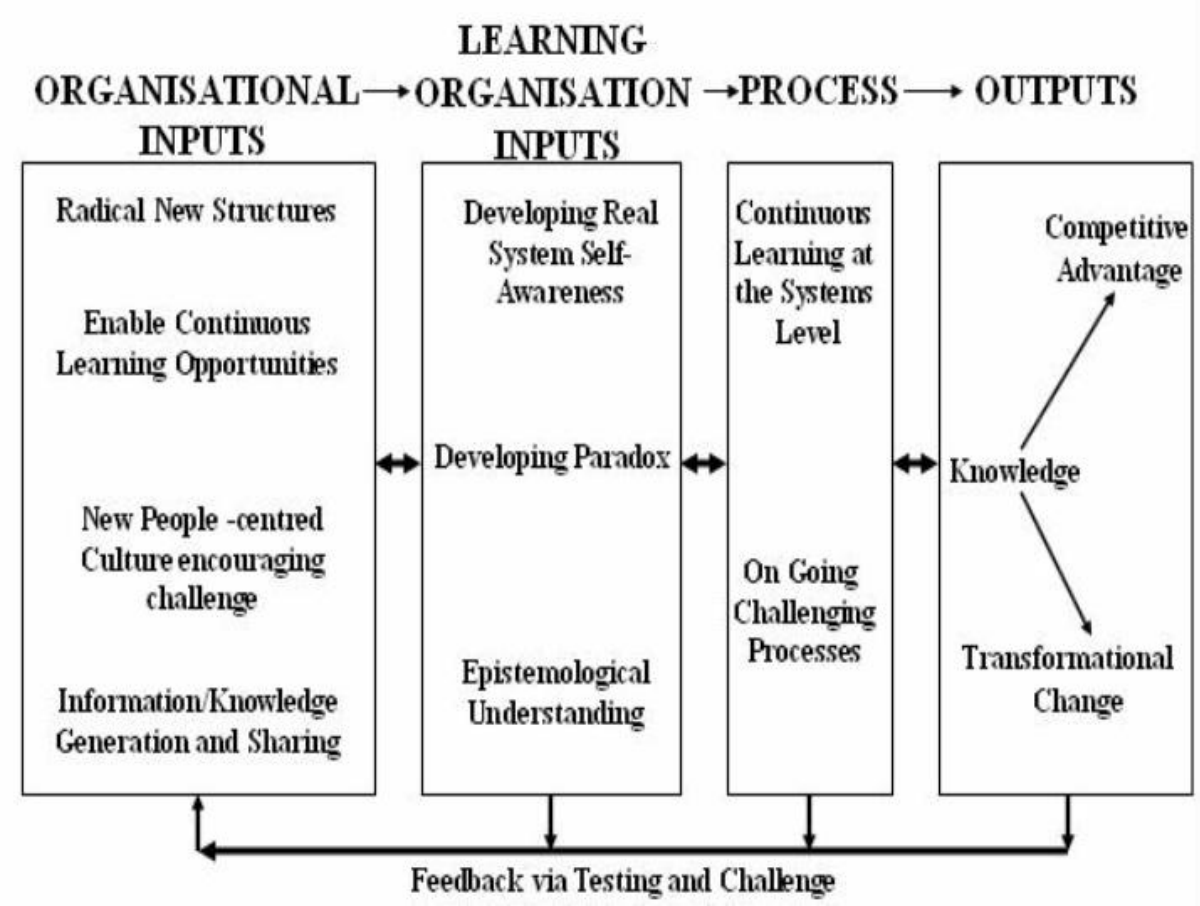

Figure 4. *The Learning Organisation – An Alternative Input/Output model*

The differences between figure 1 and figure 4 can be seen to be an overt linking of feedback loops, encouraging a focus upon the desired knowledge outputs at all times. What is meant here is that the desire is for knowledge which needs to be the centre of process development, not necessarily learning. This may, in itself, seem paradoxical but it is hoped that this focus upon knowledge outputs, instead of the acquisition processes, will ensure that organisations concentrate on the reality of the knowledge issues they need to address rather than developing measurement systems for learning processes.

Enable Continuous Learning Opportunities

It is clear that there will still need to be learning opportunities provided and supported within the organisations. However, they will need to be broader based and be focussed on the creation of new ideas as well as purely skill enhancement within the same thought frames. The opportunity must be to learn to be innovative and challenging and not be purely about incremental development. The difference will need to be that the learning opportunities need to be focussed upon the knowledge that they are designed to develop, rather than the learning itself.

New Culture of Challenge

In cases where innovation has been clearly identified within the companies in project 1 or 2 it was where, as a result of the types of learning opportunity outlined above, radically new ideas were developed within the organisations. In one case, a decision was recently taken that any new development strategy must encourage employees to go to something only loosely related to what they do. They then had to come back and explain to a peer group (within 2 weeks) in what ways they had seen anything about their work differently as a result of the development they had undertaken. Results were interesting but *"it's hard because they* [peer group] *were arguing that it wasn't different because of what they already knew. I don't know if I'll be able to change anything because they are not open minded. I've suggested they do something similar but who knows if they will"* [project 2]. It can be seen that even where an attempt was being made to do something differently, the current mental models were already undermining it. One way forward may be formal processes of challenge.

Firestone and McElroy (2003) and Blackman et al. (2004) have both argued that there needs to be managed falsification of ideas in such a way as to challenge and to encourage differences of opinions and alternative perspectives. If this process was a part of the managed organisational systems, it would fulfil the need to measure and might actively encourage openness. The processes should encourage the debate about all aspects of the organisational knowledge base and current understandings and beliefs.

Developing System Self-Awareness

To be self-aware an entity must be able to describe its thoughts, emotions and even its self-awareness. The objective will be to learn from its own and others' experience and to share the knowledge gained from this in order to develop even further. To do this successfully, the organisation must actively seek to reflect and challenge who it is and what it knows. This will be encouraged via the use of paradox and challenge (figure 4). However, it is an important category of its own when the issues of measurement are considered. It has already been noted that management, in particular, is prone to impose its mental models upon the organisation as a whole. For this to change, the development of the managers needs to be focussed upon being self-aware and being more aligned with the long term knowledge goals.

Developing Paradox

Proponents of paradox within organisations argue that, where there are differing opinions and ideas, instead of seeking coherence in order to reduce cognitive dissonance and, therefore, generating more supportive, safe cultures, the inconsistencies should become the focus of ideas and dialogue so that they may become part of the new theory-in-use (Poole and Van de Ven, 1989; Morgan, 1986). Although some writers on learning organisations intimate that there will need to be conflict in order to develop dialogue and create the tension needed for

learning (Senge, 1990; Buckler, 1998; Eisenhardt et al., 1997; Altman and Iles, 1998) in fact the overall focus upon shared mental models and 'safe' cultures tends to lead to an avoidance of dissonance and, therefore, a move away from this tension.

This need to encourage the holding of different beliefs and alternative worldviews, leads to a wish to build a learning organisation model that holds paradox as one of its core elements. Whereas a sceptical view could be seen as negative, this would be embracing difference and encouraging the organisation to focus upon the desired outputs rather than upon the processes developed to achieve it. The use of paradox, already accepted as a solution by many within the knowledge management and organisational learning fields (Poole and Van de Ven, 1989; Morgan, 1986; Snowden ,1999/2000; Handy, 1994; Pascale, 1993; Eisenhardt, et al., 1997; Stacey, 1996), should be brought more clearly into the learning organisation literature in order to create multiple mental models. What should be recognised is that the need to measure will always come to the fore within organisations. It is, therefore, important not to argue for concepts such as paradox but to consider how such an idea can be measured and rewarded.

Epistemological Understandings

This means that organisations actually need to consider the type of knowledge that they are creating. They will need to map different frameworks of knowledge and ask themselves what knowledge is and why they want it. There is evidence that, despite there being wide spread systems of knowledge management, many of them do not focus upon the actual epistemological foundations of the knowledge being created (Henderson and Blackman, 2004). This weakness leads to an assumption made that learning processes or knowledge management systems existing will be enough to develop learning. Moreover, in both projects being considered there was a tendency to confuse information and knowledge (Blackman, 2001). This has the result of leading to learning being about accessing information rather than developing new understandings and knowledge

These are fallacious assumptions so there needs to be a measurement of levels of knowledge present. How this can be done will need research, but tracking the impacts that knowledge has upon the ideas outlined above will be a beginning. Organisations can seek to interview their own employees, gaining insights as to their perspectives of knowledge and what implications these have for knowledge development. The measurement will need to be about the levels of change and not the levels of learning and/or information access.

Conclusions

A problem of self-referentiality emerged within the cases studied, because the learning targets were being set within the context of what was already considered important, then the measurements were input focussed, being based upon what the system and the learner were putting into the processes, rather than considering what was emerging out of the system. As a

result, nothing unexpected was occurring and so, instead of monitoring learning encouraging new knowledge and a transformational output, prior experience was presetting the output, leading to a reversal of the knowledge creation process. The targets were being set to confirm what was already known and the common ethos was ensuring that all staff were learning the same ideas. As there was a focus upon developing a strongly shared culture at the same time, this was strengthening the pre-emptive nature of the measurements. The reasons for wanting to measure learning can be clearly understood, but this paper has shown that, far from encouraging new learning and innovative ideas, unless the measurement systems and monitoring systems are very different from those currently in common usage, the result will be entirely counterproductive, leading to less new knowledge rather than more.

It is necessary, therefore, to develop ways of learning that will encourage different learning behaviours, thereby changing the types of outputs that are likely to emerge. Moreover, the focus of measurement must be upon the outputs of the system and not the inputs. The new figure of the learning organisation indicates this and highlights potential areas for research development.

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Endnotes

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Organizational Learning. Methodological and Measurement Issues

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Abstract

Research in Organizational Learning has increased exponentially in the recent past, a substantial portion of which is empirical research. Several scholars have noted the methodological and measurement challenges facing the field of OL. In this paper, we examine the empirical research in OL to provide insight into the methodological and measurement issues organizational learning researchers have faced. Our examination provides a basis for understanding the congruence between theoretical and empirical research in organizational learning and provides guidelines to develop richer methodologies and measures for researching organizational learning.

Introduction

Research on organizational learning (OL) has witnessed exponential growth (Crossan & Guatto, 1996), including significant growth in empirical research (Bapuji & Crossan, 2004). Despite the growth in empirical research, scholars of organizational learning have underscored the methodological and measurement challenges facing organizational learning. In this paper, we examine the methodological and measurement aspects of empirical OL research. Our examination of a large sample of published OL empirical research reveals how researchers have approached the phenomenon of organizational learning and concludes that empirical OL research is moving in diverse directions. Consequently, we raise a number of important issues that will help to further organizational learning research.

There are two primary benefits to be gained from reviewing methodological and measurement issues in OL. Firstly, selecting research methods and measures is an important challenge for the field of organizational learning (Lyles & Easterby-Smith, 2003). Our examination of the methodological and measurement aspects of OL research reveals how researchers have been dealing with this challenge. Further, we offer suggestions which will pave the way for meeting this challenge more effectively in the future.

Secondly, organizational learning is a complex construct spanning multiple levels of analysis and it is possible that different researchers may have been studying different phenomenon under the label of organizational learning (Crossan, Lane, & White, 1999). Clarifying the content of empirical research with respect to the phenomenon and level(s) of analysis will help to synthesize and cumulate OL research, which is necessary for the advancement of the field (Huber, 1991).

In order to examine the empirical research, we first selected the relevant research by using an electronic and citation search on the *Web of Science* database. We examined the methodological and measurement issues in these papers along the following dimensions: (a) research methods, (b) level of analysis, (c) main constructs, and (d) construct measurement. We looked for patterns along each of these dimensions using N6 software and then compared

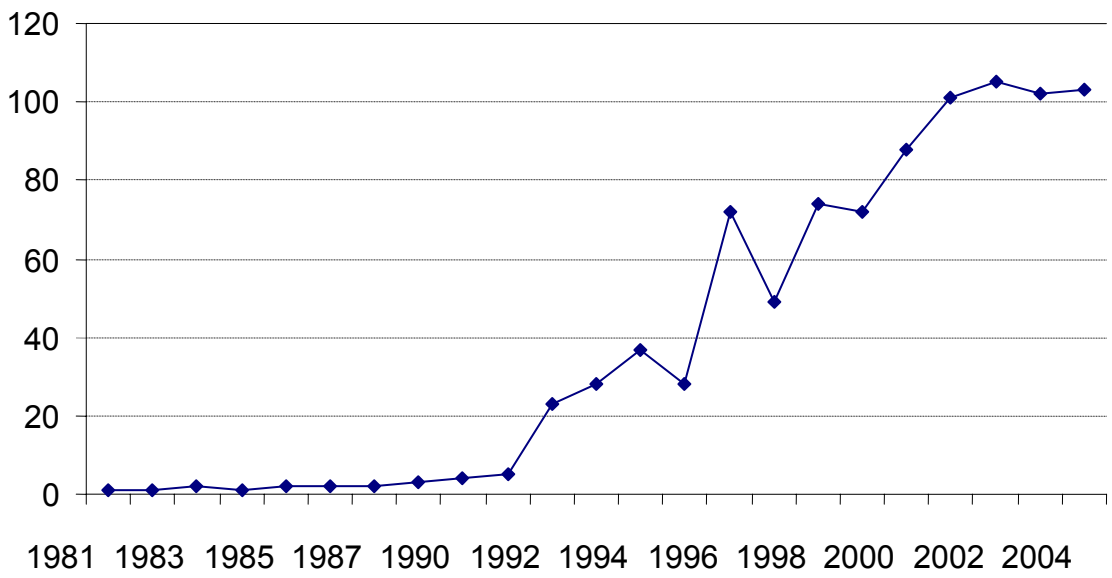
the patterns within and between empirical methods. We also compared domains and dimensions with each other looking for patterns which helped to provide further insight into trends and issues in empirical organizational learning research.

This paper is organized as follows. First, we describe how we selected our sample of papers for review and provide a rationale for using slightly different criteria for selecting papers from different time periods. We then describe how we coded and analyzed the data. We next discuss the results for quantitative empirical and qualitative empirical papers separately before discussing the results and presenting our conclusions.

Methods

Three groups of papers were selected for inclusion in the study: Group 1 – 1995 to 2004 (inclusive); Group 2 – pre-1995; Group 3 – 2002 to 2005 papers. While it appears that there is an overlap, (*i.e.*, between Group 1 and Group 3 papers) different, but related, standards for selection were applied to the groups. Group 1 papers were selected based on levels of citations. Group 3 papers were selected based on the quality of journal in which they were published do to citation lag (see details below). To begin, we generated a master list of papers from an electronic search using the key words "organizational learning". This resulted in a list of 946 papers which is represented as publications per year in Figure 1 for 1981 to 2004[2].

Figure 1. *Publications per Year*



Group 1 papers were selected from the master list of 946 papers based on a publication date of 1995 to 2005 (inclusive). This yielded a list of 774 papers. A decade going back to 1995 seemed an appropriate (if arbitrary) time period for inclusion. In order to make the

sample more relevant (and smaller) we used citations as a quality selection criterion. Citations are a measure of quality to the extent that when a paper is cited in a later work, a *de facto* "vote" (Saha, Saint & Christakis, 2003) has been cast for the quality of that paper, *i.e.*, it was selected because it made a contribution to a subsequent research publication. We chose an average of two citations per year as a quality standard for papers in Group 1 which was simply the raw number of citations for that paper divided by the number of years since its publication. This reduced the sample to 147 papers. Next we reviewed the papers and selected only those that were empirical research papers (quantitative and/or qualitative) which pared the list down to 74 papers. These Group 1 papers were published in a variety of journals, however, 80% of Group 1 papers were published in 10 journals (see Table 1).

Table 1: *Rank Order of Journals Publishing Quality Empirical Papers (1995-2004)*

Journal	*# of Pubs*	*Cumulative*	*Percentage*
Strategic Management Journal	20	20	27.03
Management Science	9	29	39.19
Organization Science	7	36	48.65
Academy of Management Journal	6	42	56.76
Administrative Science Quarterly	5	47	63.51
Journal of Marketing	3	50	67.57
Management Learning	3	53	71.62
Decision Sciences	2	55	74.32
Journal of International Business Studies	2	57	77.03
Journal of Management Studies	2	59	79.73
Advances in Strategic Management	1	60	81.08
Information Management	1	61	82.43
Information System Research	1	62	83.78
International Journal of Operations and Production Management	1	63	85.14
Journal of Business Research	1	64	86.49
Journal of Health Economics	1	65	87.84
Journal of International Economics	1	66	89.19
Journal of Management Information Systems	1	67	90.54
Journal of Marketing Research	1	68	91.89
Journal of Organizational Change Management	1	69	93.24
Journal of Product Innovation Management	1	70	94.59
Journal of the Academy of Marketing	1	71	95.95
MIS Quarterly	1	72	97.30
Organization Studies	1	73	98.65
Quality & Safety in Health Care	1	74	100
	74		

Group 2 papers are those published prior to 1995. Since there is a tendency among some scholars to use newer rather than older cites in their work, we decided to include all pre-1995 papers with 20 or more citations. We concluded that papers ten years old (1995 to 2005) with

20 citations would have an average of 2.0 cites which was our criterion for inclusion in Group 1. We chose, therefore, to include all pre-1995 papers that had 20 or more citations. To generate the list we first selected all pre-1995 papers from the original list of 946 that had 20 or more cites. This yielded a group of 39 papers which potentially fit the review criteria. From those 39 papers, we next selected those published in journals that we established as the ten primary publishers of OL papers (see Table 1). Our intention was to include papers that achieved citation levels on both longevity and quality rather than solely on longevity. This reduced the list of pre-1995 papers for inclusion in the study to 22.

Group 3 papers are the newer papers. Journal review processes have variable length, *e.g.*, it can take upwards of two years from the date of a paper's publication before it could be cited in later work. This variable lag for different journals meant that citation rate alone could not be used as a criterion for inclusion for newer papers. We, therefore, included in our study all post-2002, empirical papers that: a) had not already received an average of two or more citations as part of Group 1 sample selection (N=19) but b) were published in one of the top 10 ranked journals (see Table 1) (N=40). This resulted in the inclusion of an additional 40 papers.

The total sample of empirical papers included in the study was, therefore, 136 papers – 74 Group 1, 22 Group 2, and 40 Group 3 papers.

Data analysis

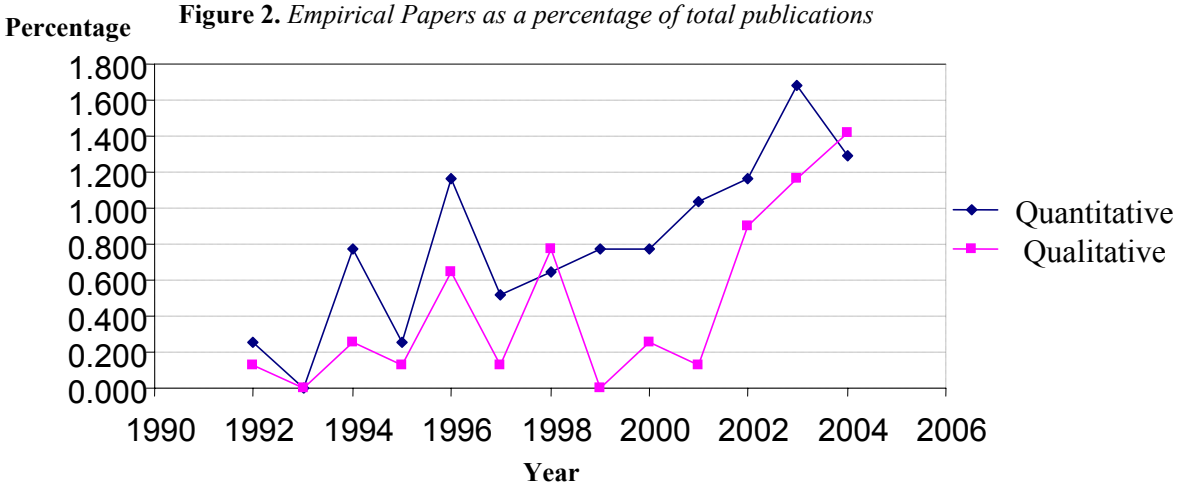
Details of papers (*i.e.*, full references, key words, abstracts) in our sample were entered into N6 (qualitative data analysis software) for coding. All papers were coded at the following general domains (or nodes): Journal, Empirical Research, Level of Analysis, Year of Publication, Industry, Country, and Theme of Paper. These general domains were then subdivided where appropriate. For example, the "Empirical" domain was subdivided into "Qualitative" and "Quantitative" with the latter having a further subdivision called "Dependent Variable". Domains and sub-domains were developed during the process of coding since we did not know *ex ante* what we might find in our review. This exercise yielded 182 domains (it was originally a larger number but some sub-domains were collapsed, *e.g.*, the themes "organizational expansion" and "corporate expansion" were collapsed into one node "expansion") applied to 136 research papers published between 1981 and 2005 on the subject of organizational learning.

Results

It is clear, from Figure 1 that the number of publications in OL continues at the high level identified in earlier reviews (*e.g.*, Crossan & Guatto, 1996; Bapuji & Crossan, 2004). Our updated review suggests that we may be seeing a plateau in terms of publication volume as can be seen from the levelling off from year 2001 to 2004 (see Figure 1).

Quantitative methods were evident in 83 papers (about 61% of the sample). Qualitative methods were used in 48 papers (about 35% of the sample). The balance utilized both qualitative and quantitative methods. Figure 2 shows the number of quantitative and qualitative papers in our sample from 1992 to 2004 (inclusive), normalized for total publications.

Figure 2. *Empirical Papers as a percentage of total publications*

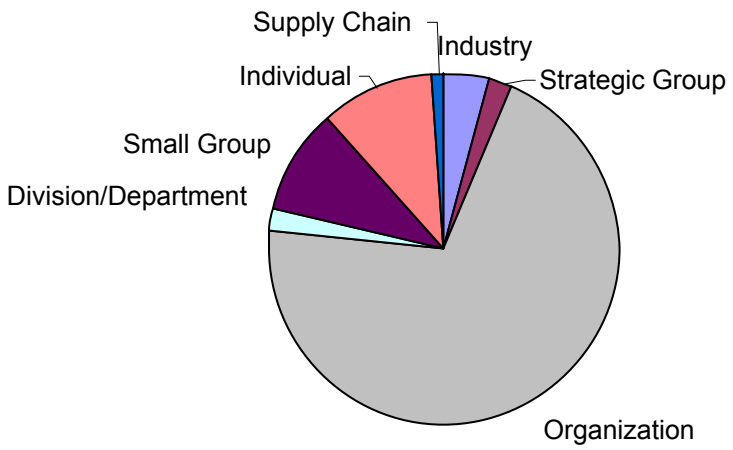


Quantitative Studies

The quantitative papers utilized surveys and archives as data sources. Most studies worked from hypotheses with a wide range of dependent variables such as, strategic motivation, customer satisfaction, aspiration levels, R&D intensity, creativity, *etc*. The five most common dependent variables in OL empirical research were: performance (46% of quantitative papers), learning (12%), innovation/creativity (10%), process/product development (7%), cycle times (4%). Performance remained the dominant dependent variable though it was operationalized differently depending upon the context. Performance has remained a core concern over time. From 1994 to 2004 (inclusive) performance appeared as the dependent variable on average 3.55 times per year with a low of one paper (in year 2000) and a high of seven papers (in year 1996). It appears to be a consistent trend in the OL quantitative research to use performance as a dependent variable and nothing yet suggests that this might change in the near future.

The unit of analysis in quantitative studies is overwhelmingly the organization. As shown in Figure 3, levels of analysis from the individual through to the industry have all been employed. However, not surprisingly, the organization is the main focus of organizational learning research.

Figure 3. *Units of Analysis in Quantitative OL Research*



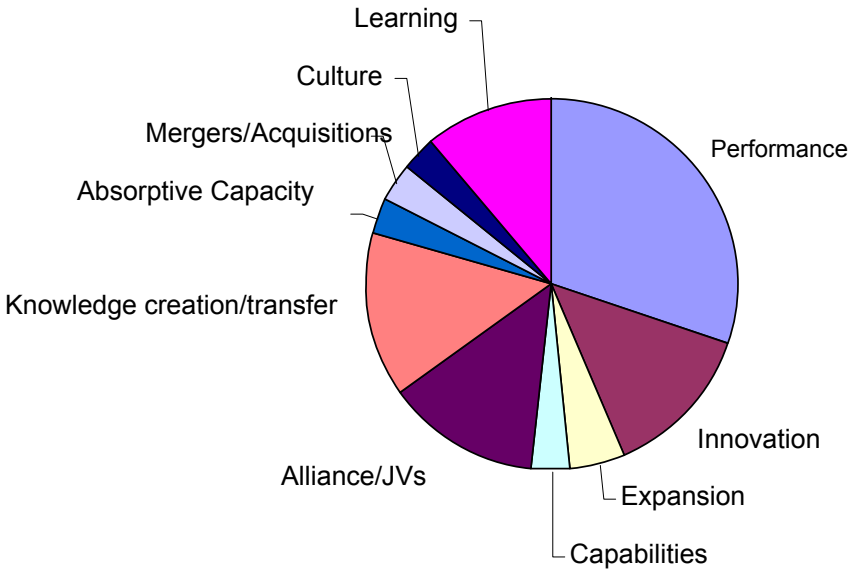
A wide variety of industries (23) are represented in the quantitative studies. The most heavily researched were biomedical/pharmaceuticals (17.54% of studies), manufacturing (12.16% of studies), then banking/financial (6.76% of studies), followed by the public sector and electronics at 5.41% each. Many studies, nearly 23%, used multiple industries to increase the generalizability of their findings.

The US and North America are the major sites for research reported in our sample. Fully 49% of research focused on US/North American firms. Europe or European firms were reported in 17.46% papers, Asia 15.87% and Scandinavia 4.76%. In terms of individual countries, the US predominates followed by Japan, China, the Netherlands, the UK, Belgium, and Denmark with single instances of several others. There appears to be a heavy weighting on North American firms which may be a result of several factors such as the locale of top journals or perhaps reflecting the interests of editorial boards, research funding organizations, location of researchers, and the dominance of English as the language of business, or users of primary research.

The studies demonstrated interest in a wide thematic landscape. Given the choices for dependent variables, it is not surprising that performance comes out as the dominant theme. Knowledge creation and transfer was next followed by innovation and strategic alliances/joint ventures. Although these are different themes, we see them as related. For example, performance in many industries may depend upon innovation which in turn depends upon the creation and transfer of knowledge. The success and performance of strategic alliances has been a focus of OL research since much of the OL research published has been related to

strategic issues (Bapuji & Crossan, 2004). Figure 4 represents the relative ranking of the top ten major themes in quantitative OL research in our sample.

Figure 4. *Key Themes in Quantitative OL Research*



The journals publishing the largest volume of quantitative OL research are, in descending order: *Strategic Management Journal* (SMJ) , *Management Science* (MS), *Organization Science* (OS), *Academy of Management Journal*, *Decision Sciences*, *Journal of Management Studies*, *Administrative Science Quarterly*, *Journal of Marketing* and *Journal of International Business Studies*. The first three journals published 48% more papers than the next six journals combined making SMJ, MS and OS the major outlets for quantitative OL research.

In summary, there are some clear trends in quantitative OL research. Performance is both the dominant theme and the dependent variable which suggests, *prima facie,* that the field is generating primary research of potential relevance to practitioners. It is, however, uncertain how much of that work is getting through to managers and actually being applied. We do not know the impact of OL research on management practice. The key practitioner journals have published few papers on OL and none that qualified for inclusion in our sample. For example, out of our master list of 946 papers, applied journals accounted for less than 2% of OL publications, *e.g.*, *Harvard Business Review* (N=3), *Sloan Management Review* (N=6), *Long Range Planning* (N=4), *California Management Review* (N=5). The reason behind such non-appearance may be that the OL empirical research has not yet produced any clear directions or generalizable prescriptions that could impact practice. Indeed, large scale

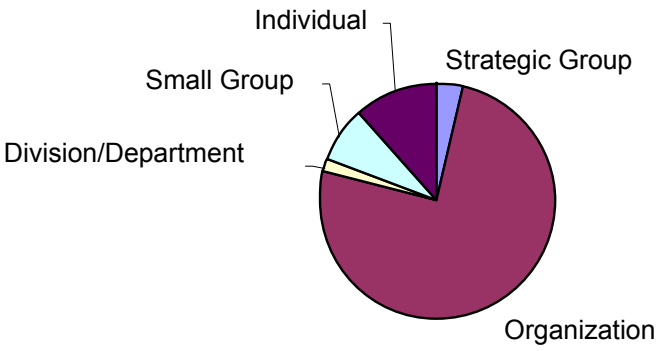
empirical research that tests the theories of organizational learning has yet to occur – something for which researchers have called (Vince, Sutcliffe & Olivera, 2002).

Qualitative Studies

The qualitative papers included in our sample relied predominantly on interviews for data sources. Although one does not necessarily associate dependent variables with qualitative research, some of the qualitative research papers have also used quantitative methods. In those papers (N=11) the dependent variables were performance, innovation and process/product development – not much different from the purely quantitative work reported above.

The unit of analysis in the qualitative papers in our sample is overwhelmingly the organization. As shown in Figure 5, levels of analysis range from the individual through to the strategic group of organizations. This is a narrower range of level of analysis than reported in quantitative research but, clearly, qualitative methods by their very nature are more suitable for individual, small group and organization level research.

Figure 5. *Levels of Analysis in Qualitative OL Research*



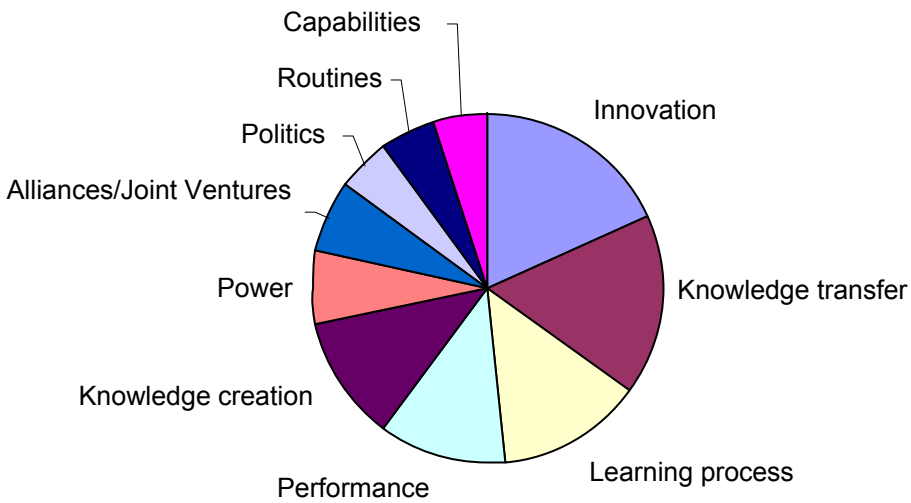
There were nearly as many industries used in the qualitative studies (N=21) as in the quantitative research (N=23); manufacturing (10.5% of papers), electronics (7.89%) and the public sector (7.89%) were the most popular industries studied followed by financial companies, biomedical organizations, services, software and automotive companies. Only 13% of the qualitative studies used multiple industries compared with 23% of quantitative papers which may reflect the limited concern of qualitative researchers with generalizability of findings.

Similar to the quantitative papers in our sample, most qualitative research was done in the US and North American organizations (43%). European sites represented the next largest

group (30%) followed by Scandinavian organizations (10%). Asian organizations did not feature strongly whereas they represented the third largest cluster for quantitative research. The individual countries that are represented most strongly are the US and the UK.

Qualitative research also demonstrated a wide range of themes. Unlike the quantitative work where performance was the dominant theme, innovation was the dominant theme in qualitative OL research. Knowledge creation was second and performance was fourth dominant behind learning process. Knowledge creation and knowledge transfer, if taken together would, however, represent the dominant theme. Figure 6 presents the relative rankings of the top ten themes.

Figure 6. *Top Ten Themes in Qualitative OL Research*



A number of studies (N=11) used both a qualitative and quantitative methodology. In all these cases the qualitative work was preparation for a quantitative study, *e.g.*, interviews or focus groups to develop questionnaire items. In order to assess the amount of qualitative work published we here consider only the qualitative work that used solely a qualitative methodology. The result is a slightly different ranking of journals. In descending order the top seven journals are: *Management Learning* (ML), *Strategic Management Journal*, *Organization Science*, *Organization Studies*, *Journal of Management Studies*, *Management Science*, *Administrative Science Quarterly*. The top three journals ML, SMJ & OS published 51% of the qualitative papers that relied solely or predominantly on a qualitative methodology to answer research questions.

In summary, qualitative research, similar to the quantitative studies, appears to have a North American focus in terms of location of organizations used in the studies and location of the journals publishing the work.

In contrast to the quantitative studies, studies that used qualitative methods focused on the phenomenon of learning, its linkage to innovation and the factors that influence organizational learning such as culture (Carroll, 1998), safe and supportive environment (Edmondson, 1999), managerial beliefs (Inkpen & Crossan, 1995), and improvisation (Miner, Bassoff, & Moorman, 2001). These studies enhance our understanding of what organizational learning is and how it can be facilitated.

Studies at the organization level that used quantitative techniques predominantly drew on archival data. The implication of these techniques and levels is better revealed when the study constructs are examined. Studies that use organization as the unit of analysis have examined constructs such as innovation adoption, experience, acquisitions, exploitation, exploration, knowledge transfer, and organizational change. The diversity of constructs suggests that researchers may actually be studying different phenomenon – they may be related phenomena, but they are different. If researchers study different phenomenon under the label of organizational learning, it poses three problems: First, it limits the synthesis of literature and thus our understanding. Second, the empirical findings contribute little to the further development of OL theories. Finally, the empirical research will have limited ability to generate research-based guidelines for organizational action, which is an area that needs focus in OL research (Huber, 1991).

Very few studies focus on learning constructs without compromising the complexity of organizational learning. The extent of compromise is further evident when we examine the measures of organizational learning. Researchers have attempted to measure organizational learning through proxy variables such as age and experience. They have used several different types of experience ranging from experience in forming strategic alliances to experience in making pizzas. Such measures do not capture organizational learning that occurs as a psycho-social process at various levels (Crossan et al., 1999; Nonaka, 1994). Indeed, some researchers have found that organization specific differences are evident in firms that have a similar type and amount of experience. These differences are largely composed of organizational processes that support the movement of learning from individual levels to social levels (Pisano, Bohmer, & Edmondson, 2001). In short, the measures predominantly used to capture organizational learning do not capture the essence of organizational learning. Consequently, the findings from these studies contribute less to the development of further theories.

Nearly all the studies that we examined fell in the positivist paradigm of research and the absence of OL research that follows other traditions is noteworthy. So while researchers seem to be studying multiple phenomena, they are so doing mostly from a positivist perspective. This near complete focus on positivist methodology limits the insights and interpretations that can be gained from OL research. Given that learning occurs as a result of multiple

interpretations (Crossan *et al*., 1999; Zahra & George, 2002), it is important that multiple interpretations and insights about organizational learning be developed from research that follows diverse traditions.

Conclusion

Our examination of the methodological and measurement issues reveals that although empirical research has grown, its congruence with the theoretical richness of organizational learning appears to be limited. We suggest that more innovative measures, specifically focused on intra-organizational processes are required for capturing organizational learning. In order to achieve this, it is important to develop an integrative framework that explains how organizational learning is supported by intra-organizational processes such as culture, leadership, and decision making. To be generalizable, such work would need to use both qualitative and quantitative research methods across industries and countries. Currently only 8% of the studies in our sample used both qualitative and quantitative measures, and of those, only 18% utilized multiple industries.

This paper contributes to the existing literature on organizational learning by: (a) developing insights through cumulating the measurement of organizational learning, (b) providing guidelines for developing better measures for organizational learning, and (c) generating debate on the methodological and measurement issues in organizational learning.

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Endnotes

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[2] Only full years are included so 2005 was excluded from Figure 1.

The clash between standardization and engagement. An ethical perspective

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Introduction

This article uses the ethics of Løgstrup (1997) to pinpoint conflicts between standardization and engagement. It is well known that the build up of competences to a great extent rest on allowing room for individuals to take responsibility and participate in an organizational context supportive of an engaged practice (see for instance Wenger, 1998), and how an engaged practice is badly influenced by overdoing the quest for standardization. By introducing moral theory as well as an empirical case from the Danish elderly care, the article sets out to clarify the mechanisms involved when measurement and standardization negatively influence the potentials for development of competences.

Highlighting the concept of engagement through an ethical framework

Ethics derives from the elementary experience that there must be an ethical dimension to life, which makes it possible to distinguish what we ought to do and what we ought not to do. In various ways ethicists attempt to arrive at an understanding of how we should pursue the good. This pursuit is often realised in a context in which rationality is regarded as the leading principle. In Kant, therefore, the assumption prevails that moral principles derive from reason alone, which in a given situation chooses the good on the basis of the categorical imperative – according to which, as is well known, we are urged to act on principles, which can be elevated to a general law. From the utilitarian point of view the good is also asserted using a point of departure that resides fundamentally in a rationally justified sense that the good consists of providing the greatest possible happiness for the greatest possible number. The thought that we can assemble ethics around a few rational principles does not, however, seem plausible, if it is to stand alone. In a more historical sense, too, the Enlightenment project, including the belief in progress along the secure paths of reason, has been put out of commission, and instead in the wake of post-modernism recent years we have seen a general tendency towards value relativity[2]. That ethics does not permit itself to be reduced to a few rational principles does not, naturally (and fortunately), have to mean that it takes its point of departure in value relativity, and it is, in fact, the aim of this article to argue that the good should be anchored in an absolute ethical dimension, which is to be found in something more fundamental than reason, namely in the form of an assumption that no man is an island. In our striving after the good (or the bad) we are mutually dependent on each other – we live, so to speak in a state of surrender to each other.

This is a question of the fundamental human condition, which we do not have the ability to transcend. This fundamental precondition – with which everyone is actually familiar – forms the central point in the formulation of ethics[3] by the theologian and philosopher, K.E. Løgstrup. He sees ethics from the viewpoint of phenomenological metaphysics, in that we cannot arrive at ethics through thought but are, so to speak, born into it, which makes its basic

attributes appear self-evident. Løgstrup expresses this himself as follows: *"it is a common philosophical observation that the most elementary phenomena of our existence are the ones we are least aware of."* (Løgstrup, 1997, p. 16). The fact that a scientific explication of the nature of the world is in danger of overlooking fundamental aspects of phenomena finds support, then, in a phenomenological reading of Løgstrup:

> "...The universe of science is constructed on the living world, and is we wish to conceive of science itself cogently (...) we first have to reawaken this experience of the world, of which it is a secondary expression."
>
> (Merleau-Ponty, 1997)

Løgstrup's ethics, however, also rest on a Christian foundation in the form of Christ's proclamation of the message of love for our neighbour. The author, Villy Sørensen, categorised Løgstrup by describing him as theologian by profession and philosopher by nature. How far Løgstrup can be understood purely on the basis of a philosophical interpretation or whether at heart a religious reading is needed to relate to his thinking is an interesting question. I will not go any further into this question here, but I myself adopt a phenomenological, non-religious reading of Løgstrup's works in so far as I relate to them by means of a purely philosophical viewpoint – clearly at the same time recognising the fact that his thought is formed within a Christian culture and is therefore marked by that code of values[4].

When I bring in Løgstrup my aim is to elaborate further on the obvious interrelatedness of engagement and competence development and to discuss how an engaged practice can be suppressed by the need for measurement with the purpose of controlling practice. I take it, therefore, that an analytical clarification can not only serve a theoretical purpose, but that its function can also be extended to practical organizational contexts. In the attempt to make the complexity of the relationship between philosophy and practice intelligible we can follow A. J. Ayer in his article *On the Analysis of Moral Judgements* (Philosophical Essays, p. 245-246) and ask to what degree we can distinguish between "*...The activity of a moralist, who sets out to elaborate a moral code or to encourage its observance, and that of a moral philosopher, whose concern is not primarily to make moral judgments but to analyse their nature?"* In this connection A. J. Ayer claims that philosophy ought to concern itself with the clarification of concepts and that its area of interest should therefore be kept separate from practice. Philosophy relates therefore to ways in which we are to understand moral concepts and over and above that takes a neutral stance on behaviour in practice. It is here my concern to illustrate that, while "moralist" and philosopher do not have the same purposes and duties, this does not necessarily give occasion to regard their areas of interest as separate, let alone to maintain such a separation between understanding the morality in the world as against changing the morality in the world.

This does not, however, mean that moral philosophy is to be translated into effective guides for action at the level of a DIY manual. Instead my intention is to show in this article

how, by employing moral philosophical reflection, we can establish the foundation for a more profound insight into what it means to relate ethically to the circumstances in which we find ourselves, and how this might affect our ability to exercise engaged moral practical reasoning in particular cases. My point of departure is, then, that a philosophical understanding of the ethical world can be fruitful in a context in which we wish to change conditions in the real world. The philosophical starting point for any description of what, ethically speaking, comes into play in such relations is taken principally from *The Ethical Demand* (1997), where K.E. Løgstrup presents a moral philosophical standpoint, which implies that ethics should not be regarded as an abstract theoretical project, which removes ethics from the concrete relations and situations in which ethics in actual fact is rooted. Instead ethics depends on the ethical demand, which derives from the basic fact, mentioned earlier, that we, to use Løgstrup's own words are entangled with each other – "that we are, as Luther expressed it, "daily bread." In the life of one another" (Løgstrup, 1997, p. 5). In later works – for instance, *Opgør med Kierkegaard* (1968), (*Settling Accounts with Kierkegaard), Norm og Spontanitet* (1972), (*Norm and Spontaneity)* – he continued the work of analysing the elementary phenomena which are basic to our existence and interpersonal co-existence. Here he brings in the so-called spontaneous, sovereign expressions of life, such as: *trust, mercy, freedom of speech, hope, sympathy* and *indignation*. The sovereign expressions of life contribute to ensuring that we accept each other in our mutual surrender and moreover function from an ontological point of view as a basis on which we formulate our ethical norms.

The ethical demand and the notion of trust

In Løgstrup the ethical demand is traced back to the fact that we cannot hold ourselves free of each other's lives and that in this encounter with each other we acquire influence on the other's life regardless of whether we wish it or not. "*Our concern is here only to point out the intimate connection between the fact and the demand, to point out that to a great extent the demand grows out of the fact. In other words, the fact forces upon us the alternative: either we take care of the other person's life or we ruin it. Given man's creatureliness there is no third alternative.*" (Løgstrup, 1997, p. 18). From this fact springs the ethical demand, which is always present in interpersonal co-existence, namely the demand that we are already woven into each other's lives and delivered over to each other. The fundamental condition demands that we are receptive to the other.

It is, however, also the case that we would be in an unbearably extreme position if we had not equipped ourselves with norms, which could protect us from direct confrontation with the ethical demand to take care of the life of the other. Even though co-existence rests on a basic assumption of trust, we surrender our existence by showing each other a conditional trust, which spares us from unbearable exposure. We are forced, so to speak, to trivialise the basic prerequisite of life which I have spoken of by giving it a form which makes existence bearable and practicable. Existence is given shape, then, by the conventional norms with

which we surround ourselves in order to preserve a smooth and functional co-existence - *"Without the protection of the conventional norms, association with other people would be unbearable"* (Løgstrup, 1997, p. 19). In that context the norms are wedged in like a neutralising instrument, which provides a space for action in which we do not need to relate to the fundamental, radical alternatives of human existence every time we come into contact with one another. That which is not unconditional care for the other's life is destruction thereof. Løgstrup notes that it is the child who does not manage to bear the comfortable mantle of convention, but encounters the world with trust and without reservations - *"The child, being yet outside of convention, still stands in the power of the given alternative. If he or she fails to encounter love, his or her future possibilities are destroyed – as psychology and psychiatry have amply shown."* (Løgstrup, 1997, p. 20).

Through an analysis of the concept of trust Løgstrup illustrates the mutual dependency between people, while at the same time pointing out that the other's self-surrender to me equally demands that I am always unilaterally under obligation to the person I meet. It is only I who can determine whether I will accept or reject the other, or, as Løgstrup expresses it: *"A person never has something to do with another person without also having some degree of control over him or her. "* (Løgstrup, 1996, p. 25). It is, then, not a question of the ethics of trust in a sentimental sense. The ethical demand made of the other is not a matter of care but represents a fundamental precondition of being human consisting of self-surrender. The importance of avoiding sentimentalising the concept of trust cannot be exaggerated. In this respect trust must be regarded as fundamental to such an extent that we would not be able to exist if co-existence were not supported by this fundamental mechanism of trust. All human co-existence rests, then, on a primary assumption of trust, or rather self-surrender. This is made even more evident by the fact that we are most often surprised and demand an explanation, if we meet with rejection and mistrust[5].

> "Regardless of how varied the communication between persons may be, it always involves the risk of one person daring to lay him or herself open to the other in the hope of a response. This is the essence of communication and it is the fundamental phenomenon of ethical life."
>
> (Løgstrup, 1997, p. 17).

At the same time it is not a question here of a concept of trust which stands or falls on whether or not it is honoured. It is a matter of the simple form of trust expressed by the fact that we cannot avoid surrendering to each other. Regardless of whether we like each other or not, we cannot live without referring to each other and to the community. Trust lies, therefore, in the nature of that reference – and by extension self-surrender – as a common characteristic of all co-existence. Despite the fact that in concrete historical contexts trust can be realised under more or less favourable conditions, it is the self-surrendering that is always the underlying factor.

In crisis situations, too, we can speak of self-surrender as a fundamental condition of our co-existence. The situation in the Middle East, for example, illustrates quite clearly that even under extreme conditions our lives are fundamentally bound up with the assumption that we are entangled in each other's lives and that as a result we cannot avoid surrendering ourselves to each other. Even though the sovereign expressions of life, which determine that we can show acceptance, are rendered inoperative in such a locked situation, Løgstrup's point is that these can never be entirely destroyed; if this were the case, there could no longer be life.

> "The simple conflict within a conflict, namely that one has dared to come forward in the hope of being accepted but was not accepted, makes everything either black or white and makes one's accusation correspondingly irrevocable (Løgstrup, 1997, p. 10). (…) If communication between persons in conflict with each other is cut off, sparks of moral reproach and accusations begin to fly, because there is self-surrender in all forms of communication. Rejected self-surrender expresses itself in moral accusations because the situation is emotional and plain, and because the exposure must at all costs be kept covered up."
>
> (Løgstrup, 1997, p.11).

Spontaneity

The ethical demand can only be honoured spontaneously. As soon as we begin to think about whether we are really acting as we ought, the focus moves to ourselves and away from the essence: to act exclusively in relation to the other person. From an ideal perspective we do not act ethically in such situations and end up if the worst comes to the worst in self-justification and moralizing behaviour.

The demand is, furthermore, unfulfilled. Since we do not have universal knowledge, we can never know to what extent the help we proffer the other is the help which, from an ethical point of view, best fulfils the unspoken need for help. In this way the demand is also unspoken since we approach the other because we are aware of the other's need, not because we explicitly meet because of a request for help[6]. In actual fact in the ethical demand there lies a requirement that we help others even though they themselves are not inclined to accept help. For example, to make life easy we can refrain from criticising a colleague's working methods (criticism which could perhaps do him some good) and instead tell him what we know he is fishing to hear:

> "The other person's interpretation of the implications of the trust offered or desired is one thing, and the demand which is implicit in that trust as, one might say, a "fact of creation" which I must interpret is quite another thing. And these two interpretations may well conflict with each other. The situation may be such that I am challenged to oppose the very thing which the other person expects and wishes me to do for him or her, because this alone will serve his or her best interest. In other words, the challenge rests on the assumption that I know better than he or she does what is best for him or her".
>
> (Løgstrup, 1997, p. 21).

Now we could take issue here and question the ideal of spontaneity as a precondition for our ethical actions, especially in the light of contemporary diagnoses pointing out the hyper-complexity of the society we live in (e.g. Ovortrup, 2001, Giddens, 1996), with a subsequent claim that individuals today are forced out in an almost endless cycle of reflective behaviour and reflection about life's existential conditions and, in particular, life's innumerable choices.

> "Modernity's reflexivity upsets the expectations of the Enlightenment's reason, even though it is itself a product of that reason. (...) The demand for reason was on its way to win over the dogmas of tradition and offered a sense of security as compensation for the arbitrary nature of habits and customs. But modernity's reflexivity actually undermines secure knowledge, even in science's most central areas. Science does not depend on the induction accumulation of proofs, but on the methodological principle of doubt. No matter how acclaimed and apparently established a given scientific doctrine might be, it is always open for revision or for total rejection in the light of new ideas of results. This inbuilt relation between modernity and radical doubt is a question which, when it becomes visible, is not only confusing for philosophers but also existentially disturbing for ordinary individuals."
>
> (Giddens, 1996, p. 33, my translation)

With reflexivity forming today's most prominent characteristic, the demand for spontaneity in ethical action surely loses its power. Today's individuals will surely reflect on the ways in which they can step into a situation in an ethically responsible way - even, perhaps, making use of self-dramatisation. Is our resignation in front of the supermarket freezer - (Has the chicken had a healthy life? If I choose an ecological one, can we afford fruit for the children?) - not an expression of our being constantly placed in situations, in which we have to reflect, find a way forward to an ethically responsible solution to the hyper-complex oppositions which life confronts us with?[7]

If we accept that people today are extensively characterised by reflexive behaviour, how does that leaves us in relation to the requirement for spontaneity as a precondition for the honouring of the ethical demand we find ourselves in, when a given situation demands that we go to the help of another? As an ideal consideration Løgstrup[8] maintains the radical nature of the demand and the impossibility of fulfilling it. At the same time he is conscious of the fact that the ideal is often only realised in an approximate version, since life as lived requires compromises, when we consider a situation before acting, or when we end up acting out of duty, because we know it is expected of us. This is, however, in reality better than not helping at all, even though from an ideal viewpoint it cannot be regarded as an ethically correct action, since the action does not answer to the radicality of the demand to act exclusively for the sake of the other person. This means, then, that in the course of the process towards arriving at the execution of a helping action, a slippage has taken place, so that an egoistic element has crept in, as our thought has, for example, been more in relation to ourselves than to the other.

From a teleological perspective the radicality of the demand is a reminder that we cannot live up to the radical demands, which are contained in the message of neighbourly love. In that way we are reminded of our own fallibility. These thoughts can also be seen from a purely phenomenological standpoint, as generally applicable considerations on the nature of existence, in which solely from a human view we can, crudely speaking, only develop into whole people if, with sufficient self-understanding and balance, we manage to accept both our strong and our weak sides. If we do not possess the ability to be humble, we will end in the worst case in a condition of grandiose distortions, unable to relate to our surroundings in a normal manner and therefore also unable to approach the other.

How standardization challenges engagement. An ethical perspective on competence development

For an overall treatment *The Ethical Demand* provides a significant moral-philosophical viewpoint, which makes it possible to conduct and precisely formulated distinction between morality and ethics. Taking its starting point in the central concept of ethical demand, this work allows these relations to emerge clearly. The table below summarises the idea that ethical demand is not affected by moral norms, whereas these norms must constantly be viewed with reference to and consequent on the ethical demand. Furthermore, we give existence form by means of moral norms, since – as I mentioned earlier – it would be uncomfortable if convention did not neutralise the radical alternative (between destruction and care for the other), which is the fundamental precondition of existence.

Ethical demand	Radical, silent, unilateral, unrealisable
Morality, social norms, rules, laws, ideas	Relative,articulated, bilateral, realisable

Taking Løgstrup's ethics as my starting point, I will further attempt to contribute to a deeper insight into the ways in which we are challenged in the development of engagement and competences in a context influenced by the quest for abstract measurement and standardization of skills. This does not give rise, then, to a decided ethic of action. It will often happen that we will be far too quick to attempt to attain a position oriented towards action, but forget to focus on the relations that lie behind the situation. My perspective is indebted to Anders Lindseth, who works with ethics in relation to the health service, which often demands responses directed at action to ethical questions (Lindseth, 2002). Lindseth's thematic treatment of this situation emphasises, moreover, that "*...The tendency always to answer the question about what we should do is powerful. If ethics in this way does not become downright unethical, it is reduced to an "ethical skill" which is to have a supplementary function in relation to professional skill.*" (Lindseth, 2002, p. 67). At the same time we must consider that situations which require ethical decision-making are unique by virtue of the fact that they are embodied in a specific context. Even though rules and firm

principles can be necessary for the management of ethical questions, we will, as I have said, never be able to establish a form of ethical preparedness, in which every situation is placed in a form capable of generalisation. For Løgstrup the consequences of generalising reasoning end, therefore, often in moralism, where morality comes into being for its own sake (*Norm og Spontanitet*, 1972, p. 36 (*Norm and Spontaneity*)). Lindseth mentions a curious example of this taken from the health service (Lindseth, 2002, p. 72), in which a project was to investigate the effect of singing to patients with dementia, on the basis of a hypothesis that this might possibly improve their condition. But to sing for the sick only becomes a well-chosen ethical act in a given situation, when the singer spontaneously sings from excess of energy and good will, and if the sick person apparently values this contribution. Alternatively, the act can border on the embarrassing if it is forced from a sense that this is something that ought to be done in the situation, because this is stressed in the general plan of the given investigation. Lindseth summarises the situation somewhat humorously with the words: "*Here we also see what constitutes the difference between joy and horror: In the one instance the patient is met with and cared for, in the other made into an object which has to be dealt with*" (Lindseth, 2002, p.73). Standardization of care giving relations fall short of capturing what is really at stake in the practice of nursing.

A case study[9] *outlining the connection between standardization, engagement, and the development of competences*

Articulation of knowledge into formalized standards tends to create conflicts with the knowledge and ethos embedded in a given practice. We can see fundamentally ethical founded problems with consequences for the ability to grow knowledge in an organisation which rests on systems or procedures for standardization and measurement of knowledge and resources - such as IT systems with the purpose of standardization of service and quality through a detailed system for monitoring all aspects of working processes. What often happens here is that, despite the best of intentions, people find to their cost that in reality the working processes that are disposed to measurement subject their surroundings to control and surveillance, whereby individual employees are made into objects in relation to their working area. When technology involves moves towards control and surveillance, employees experience inevitable loss of self-esteem and reduced sense of responsibility in relation to their working situation. In what follows, I will introduce a case in order to discuss why it becomes difficult to establish an organizational context supportive of the development of competences in an organizational setting influenced by the quest for standardization and measurement.

Public service care for the elderly in Denmark has been undergoing change during the past decade in an attempt at quality control in focus areas such as the planning of care, time for the individual user, better management of resources and quality assurance of services provided. Tools have been developed alongside concepts of quality particularly related to practice with

the aim of supporting knowledge gathering and the assurance of quality in this area. These initiatives have at the same time brought about an increase in standardization in the description of job functions with a view to establishing a uniform basis of comparison for quality assessments. The majority of the councils in the country have introduced "*Fælles Spr*og" or "*Common Language*" (The Councils' National Assembly, 1998), which consists of a catalogue supporting an undifferentiated categorisation of the needs of the elderly in relation to an assessment of the help required and to the means by which that should be effected. The staff involved are, then, required to develop a common conceptual apparatus using "*Common Language*". In this way councils are attempting to establish an indiscriminate starting point for the service provided in the area of care for the elderly. Staff can, for instance, have different views of what the notion of "cleaning" covers, and this can bring about variations in the quality of the service provided. Using "*Common Language*" as a point of reference provides a tool both for quality control and for the gathering of professional knowledge on a systematic basis. In conjunction with "*Common Language*" most councils have introduced the IT care system, CARE, which is supposed to optimise opportunities to realise good intentions relating to quality development and knowledge management. In direct contrast to such intentions, however, the use of these systems raises a series of problems. The head of the Common Language Centre in the Councils' National Assembly summarised the current state of play in the area with the following comment:

> "...The question here is, however, whether many councils are unconsciously in the process of building up and locking themselves into the development of an automated factory for the service industry with detailed instruments for management and control in respect of the individual member of staff and in which the Common Language tool is used to underpin this (...). IT systems make this possible with detailed measurements of the time spent by employees with users (...). Whether this will be effective I don't know. But how is that to be measured? It may be that the lower toilet can be dealt with more quickly than Taylorian time control allows, but what if the number of elderly inmates requiring this particular service increases? And why are they needing that form of help? Such answers are never provided".
>
> (Nielsen, 2001)

The desire to have control of one's surroundings manifests itself in all aspects of society[10], including the area associated with the elderly, in which there prevails a significant need to be able to document the fact that "one is doing one's bit". From political quarters as well as from the press come frequent demands for explanations for the ways in which public funds are translated into care provision. When skills have to be deciphered and formalised into forms of care provision that lend themselves to explication, the field of practice in which skills are practised and developed becomes circumscribed by the exercise of control practice.

> "It is perhaps the adult mistrust that exists between the political system and the professional system based on the many individual cases in circulation that sets this culture of management, regulation and control so vigorously in motion."
>
> (Nielsen, 2001)

The above quotations raise significant ethical questions, which bear on the increased standardization that has taken place in care for the elderly, including the greater awareness among employees of the possibility of being under surveillance in relation to the performance of their work. The circumstance that the elderly care sector apparently have to exist under the partly politically and public defined yoke of surveillance does not mean that we do not need to relate ethically to its presence. Here, to use a slight rewording of Løgstrup's phenomenological commentary regarding the fact that the self-evidence of phenomena contributes to making their scientific analysis difficult, we can claim that the culture of control must also be regarded as a negative premise when systems of standardization are to be meaningfully introduced. In the same way as current care systems, the declarations of intent behind for instance IT systems generally speaking represent nothing but the best intentions. They often take as their starting point the purely professional benefits of these systems, which quite reasonably and banally have to satisfy expectations for ensuring the quality of working processes, to optimise conditions for the provision of professional knowledge and to increase efficiency of working practices so that mental resources can be freed up for use in other areas.

Now we could ask how, using Løgstrup's ethics in a real situation, we can deal with the ethical questions which insinuate themselves unseen in the wake of systems such as the current care system. Is Løgstrup not sold down the river? If the culture of surveillance dominates our relations, our surrender to each other is no longer a fundamental condition for existence. Here I must repeat that the very fact that we react with shock or amazement when we encounter mistrust and rejection, while we at the outset expect sympathetic acceptance when we risk exposure, emphasises the fact that as individuals we are in the last analysis surrendered to each other for better or for worse. Staff confronted with the current system in a context in which its use promotes surveillance experience precisely such unreasonable rejection when, as responsible employees, they feed information to the system, which subsequently places the data in a context where they set in motion a controlling registration of the degree to which the employee has fulfilled specific work functions in a satisfactory manner.

The system's measurement of time spent alongside its ability to write out work lists (so-called "visiting notes") with detailed specifications of tasks implies a potential risk of removing from individual employees the chance to take responsibility for their own work.

> "(...) Employees know that as long as they carry out their work to the standard required, they cannot be criticised (...). If it comes to a dispute, there is a desire to be able to assess at what point an action deviated from the course agreed upon." (Interview with employee, Fredericia Council)

The system implicit holds a potential which in a worst case scenario could establish a context for use, in which the system is employed in a manner based on rejection and mistrust in relation to employees instead of trust, which supports a form of communication in which the individual dares to come forward in the knowledge of sympathetic acceptance.

As mentioned in my introduction, I am not arguing in favour of our sketching out ethical instructions for action, but on the other hand we must focus on how we can ensure the best conditions for a form of communication which enables individuals to surrender themselves in situations without encountering a system which supports a control-oriented form of collaboration. That it is meaningless to sketch out general ethical instructions for action is evident from Lindseth and is also underlined by the quotation below, which stresses the fact that values that are good, ethically speaking, are taken for granted in the public authorities of the real world.

> "We have possibly now come so far away from a control/direction swing of the pendulum – mostly recently with nursing home supervision and Blue flag certification from the Ministry for Scial Affairs – that we in Denmark now have a completely unique law (flexible home help), which basically attempts to regulate how employees are to work in the field of elderly care. In simple terms the law now says that employees are free to be flexible and to use their heads and their eyes when they are at work. It is striking that we now have a law about completely ordinary values in good care and nursing practice in the encounter between citizens and employees. This ought to be self-evident, and so it is, thank goodness, out in the public authorities of the real world."
>
> (Nielsen, 2001, my translation)

Here Løgstrup's assumptions about trust being a fundamental condition in our existence is illustrated, since employees manage to meet the demands they face in relation to their work. When IT systems and standardization of work processes are to be involved, we have not only to direct our attention to the professional skills which these systems are to support, but also to try to make space so that communication between employees and interaction with such system recognise the need for the individual to be acknowledged. The precondition for being able to establish room for competence development fundamentally depends on the degree to which we are in a position to create space for commitment and engaged collaboration. To relate to the fundamental conditions for collaboration does not require a supplementary ethics of action, but on the contrary first and foremost an insight – such as that offered by Løgstrup – into the nature of ethics itself. In that way the opportunity is provided for ethical reflection about the ways in which interpersonal interaction is fundamentally based on ethics.

Instrumental ordering of knowledge

Standardization of work processes is of course necessary to a certain extent. This is pointed out in the work on learning in communities of practice done by Wenger (Wenger, 1998). According to Wenger our existence rests on our being in practice and living through taking

part in communities of practice. Thereby practice is *about meaning as an experience of everyday life* (Wenger, 1998, p. 52). Communities of practice are formed by dimensions of mutual engagement (Who are we?), joint enterprise (Where are we heading?) and shared repertoire (How do we talk about matters that matter?). Our being in the world is about constructing meaning by negotiating meaning through a dual process of participation and reification. In this sense reification gives form to and organise knowledge construction and thereby function as a platform for our participating in negotiation of meaning. In order to avoid chaos, any community of practice rests on products of reification in the form of reflections of practice translated into procedures, abstractions and different kinds of tools allowing us to navigate and participate in practice. On the other hand, if the balance tips over and reification dominates, the degree of formalization will evidently lend itself to the development of an instrumental practice (Wenger, 1996, p. 65). In the elderly care case, where reification is maintained through a high degree of standardization followed by little overlap to participation, knowledge production falls short of capturing much of the knowledge embedded in care giving relationships and in practice these systems live there own lives:

> "(...) Well, about CARE [ed. IT system] we went on a course 2 years ago this summer (..) Common Language? Here I have to admit, it is this little silly "gape catalogue"? .. well it is still lying in my locker, and right now they are being collected because they have to be revised or whatever it is they have to be..But there is no used cornes – I don't use it, really I don't. We should of course, and I can't speak on behalf of all my collegues, but they look as they did when we got them. *Interviewer: But they are connected to the criteria for central visitation of the needs of the elderly. Are you familiar with these criterias?* Yeah, well some of them one knows, I guess..but then, they are suddenly changed, and then it is suddenly called a "C2 service pack" and so on..But I don't feel that this have been properly explained to us. It is possible that it has been explained once I was off, but I don't think that we have that much off, so in a way it just goes over the heads of us..and when we experience that Mrs. Jensen has become more weak then we request for more help further on in the system, and then it goes from a C2 to a C3 or the other way round. I have to admit, It doesn't interest me. What interests me is that the clients get what they have the right to get, then they can call it whatever they will."
>
> (Social health care assistant, Fredericia Council)

> "It feels as if bit by bit we have had too many administrative tasks. I would like to sit by a computer if that was what I was supposed to do. But that wasn't the reason why I took this job in the first place. And if the people who figure out the plans are to far away from the people who has to use the system, then it turns into a kind of bureaucracy."
>
> (Social health care assistant, Fredericia Council)

The need to ensure across the board documentation satisfies the desire to establish control, comparable forms of care provision and resource management in elderly care. But this takes place at the expense of insight into contextual knowledge based on experience. This form of

experience-based understanding is not reflected in the conceptual world of the standardisized systems used in the elderly care sector:

> "(...) 10-20% can be seen here, but I have so many consultancy tasks – indirect nursing – which are not reflected in CARE [ed. IT system]."
>
> (Nurse in Fredericia Council)

In the long run, focusing on standards in the form of rigid reifications - such as visiting notes with directive job descriptions leaving little decision to the employees own evaluation of a given situation - promotes standard performance carried out in accordance with standard specifications. Under circumstances where firsthand knowledge is replaced by formulae's, the ideal of measurement and standardization leads to the development of an ill-advised practice. This is reflected in Heidegger's notion of "enframing" in referring to the kind of ordering characteristic of technology, which causes us to experience everything as recourses in a system that is to be enhanced and controlled (Heidegger, 1993). In the concrete case, the employee's attention is turned away from the needs of the elderly towards the needs for documentation of work tasks and results. Through standardization and time pressure we loose ethos in care giving and the awareness of what has to be done in particular cases. Since standardization de contextualizes and obscures the feeling for what care giving relation means we end up not being able to give care out of spontaneous responsiveness to the needs of the other. The kind of competences supported in this setting promotes bureaucratic administrative "out-of-the-box" ready for generalization skills instead of the development of situated experienced based skills in the field of a manifold practice.

> "(...) In the earlier days [ed.: approximately 15 years ago] we used to have 3 meetings during daytime alone. Here people talked about what they were doing and what was going on with our clients. Now we have visiting notes and of course we could use them as a background for a discussion of our views of care, but there is no time for this kind of activity. Also, if I get a visiting note written by the clients primary contact person, I prefer a specific description in order to be able to carry out the work in a way similar to the way the usual contact person carry out the work. Therefore, I'm dependent on detailed visiting notes. Earlier, when we were more employees there was always somebody around who knew what to do, now we are very dependent on the visiting notes. For instance at night shifts we run a tight schedule with few people who cannot possible know the needs of all the different clients in details. Therefore we follow the visiting notes very strict – they are our guarantee that we do what has to be done, without visiting notes we would be lost."
>
> (Interview with employee at nursing home in Fredericia Council)

Concluding remarks

Through an ethical perspective, I have highlighted the releation beteween engagement and competence development in an organizational context characterized by the demand for documentation and measurement. Under such circumstances opportunities for carrying out engaged skills development in elderly care have from the outset little chance of success, since the development of the professionalism of employees is kept at a level of competence which does not motivate them to become involved. The focus on measurement results in a systematisation of the knowledge area in elderly care, which involves the accumulation of data with the aim of passing on content material for statisticians, for resource management and for knowledge-gathering. But no springboard is set up to support competence development, since the focus on standards and classification emphasises standard performance, carried out in accordance with general specifications of requirements. From an ethical point of view, it is shown that when reification out balance participation, care giving relations fall short of capturing what is essentially involved in the practice of nursing.

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Endnotes

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[2] Ethics is spoken of from a multitude of standpoints and positions. Behind the surface differences in these discussions there hides a deeper disagreement about what ethics actually is. As early as in 1903, in his major work, *Principia Ethica*, G.E. Moore drew attention to this question in his observation of the fact that it is a mistake to assume that our ethical concepts can be reduced to something else. By attempting to define ethics as something other than what it is, we are guilty, according to Moore, of the *naturalistic fallacy*. Ethics must, then, be regarded as unique, which is why it makes no sense to look for a definition of the good by using other concepts. If, for example, we assume that the good is synonymous with what advances man's survival, we have defined ethics biologically. What is more, the quality "good" cannot be seen as being dependent on culture. In Moore's understanding of ethics, "good" is a quality which has always existed and which does not allow itself to be reduced to other culture-dependent qualities. Moore was a realist and an intuitionist and believed that we achieve insight into the good by "looking for" that quality in the real world, where we comprehend the good intuitively and without the use of scientific method. How an intellectual, scientific understanding could derive knowledge about the good, when it was to be seen as something intuitively present in existence remained, as a result, an unresolved problem in Moore's ethics. Nevertheless Moore's explanation of the naturalistic fallacy has had a decisive influence on the subsequent debate in moral philosophy.

[3] We could pose the teasing question here whether Løgstrup is not guilty of *the naturalistic fallacy*. This question is thoroughly treated by K. Van Kooten Niekerk (2002) in an article which concludes with a denial of the charge, since in the last instance Løgstrup finds the justification for his ethics "... in our humanity, which makes us recognise that in the other's surrender to us there lies a requirement to take care of his life" (K. Van Kooten Niekerk, 2002, p. 48). In other words here, too, we recognise intuitively what is demanded of us in our mutual dependency on each other. In the ethical demand to take care of the other lies a fundamental attribute of ethics, which cannot be reduced to other qualities.

[4] Løgstrup himself claimed that he provided a humanistic, phenomenological description of neighbourly love, but opinion among theologians and philosophers is divided as to how far we can construct a purely phenomenological interpretation of Løgstrup.

[5] Distrust is so to speak the deficient form of trust.

[6] The drowning man nevertheless calls loudly and incessantly for help, but it is not the specific request that makes us jump into the water. At best it helps to draw attention to the fact that there is a person in danger. If he did not call, we would jump into the water anyway.

[7] Through this lens trust (not unexpectedly) is made into an instrument for the reduction of social complexity (Niklas Luhmann, 1999)

[8] Løgstrup died in 1981 and has, therefore, played no part in the debate about the degree to which society is or is not hyper-complex.

[9] This case study rests on 8 qualitative interviews with staff in the elderly care sector. The case study is furthermore supported by the large-scale study,"*Den danske ældrepleje under forandring – En kontrolleret, randomiseret interventionsundersøgelse i 36 kommuner"* ("Danish elderly care in transformation – A controlled, randomised intervention study in 36 councils") (Schultz-Larsen et al., 2004). This large-scale study throws light on processes of organizational adaptation in the area of care for the elderly over a three-year period (from 2000 to 2003).

[10] In Foucault's *Surveiller et punir* (1975) (trans. *Discipline and Punish* 1991), an interesting explanation from the viewpoint of cultural history can be found of the significance and mechanisms of surveillance, which from a bird's eye view can shed light on the reasons why the use of such systems often develops in opposition to their original intention and lapses into control and surveillance rather than promoting professional achievement and building up a body of knowledge. In his description of the mechanisms underlying the power of normalisation, Foucault established the concept of the examining citizen, whose origins he places in the 18th century. Here attention is brought to bear on the individual as an object of knowledge, which does not simply mean that the individual is subjected to examination but involves the additional establishment of disciplinary methods for the control of the individual. To an ever-increasing extent we form part of contextual frameworks in which we are submitted to examination and registration, which in turn permit the separation of the normal from the "special case". In the wake of this interest in

exposing conditions relating to the individual follows the dissemination of disciplinary methods for regulating the behaviour of individuals in a manner which is satisfactory both for society and for the individuals themselves . Through his analysis, then, Foucault illustrates the circumstances that determine the power of normalisation, which will always strive for control in its promotion of the normal over the special case. It is important to stress that "the power", as such, often cannot be seen explicitly to be present and still less allows itself to be placed in physical systems or political contexts. In other words for Foucault the power is seen rather as a network of relations than as a concrete colossus.

Revealing practice: surgical training in operating theatres

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Operations rooms may vary from those that include no personnel in training to those that involve students, nurses, interns and residents. Obviously, in teaching situations, part of everyone's energy must go into the initiation process. The presence of students keeps people on their toes, keeps an air of questioning and striving alive, which infuses the surgery (...) Division of labour is pushed further in teaching hospitals. For one thing, more hands are available; for another, there is a constant effort to split off suitable practice tasks which can give a student experience and afford him a gradual introduction into the core of the operation.

(Wilson, 1954)

Introduction

It is widely recognised in many organisational contexts that forms of apprenticeship constitute an important resource for learners of new skills and knowledge. One of the most significant contributions to this issue in organisational analysis and learning theory can be found in the writings of Lave and Wenger (1991). The authors develop an analytical perspective on apprenticeship and situated learning - a perspective distinct from the conventional notions of teaching and learning. Lave and Wenger argues that the process by which a newcomer can become a full competent participant in a community of practice are dependent on access to practice and opportunities to participate with other competent members within the lived experience of the everyday work. This work has been influential on research in the learning sciences and other disciplines (cf. Lemke 1990, Ball and Lampert 1999, Cobb et. al. 2001), and in particular in studies of apprenticeship in practice (cf. Hall and Stevens 1995, Koschman and LeBaron 2002). Even though we are sympathetic to the idea of informal learning and that learning takes place in interaction with other members of a community of practice, it is interesting to recognise - save for a very few exceptions (cf. Goodwin 1994, Sutter 2000) - that studies have failed to examine how learning arises in and through interaction. Studies have not been concerned with fine-grained analysis of what people actually do when learning in practice, in particular the ways in which opportunities for learning in practice is created, sustained and managed in and through interaction within the developing course of workplace activities.

In this paper we would like to examine a particular setting in which professional training relies upon contingent forms of apprenticeship through which trainees simultaneously support complex collaborative activities whilst receiving insight and instruction concerning practice and procedure. The setting in question is the operating theatre in which multiple participants with very different skills and responsibilities are involved in highly distinct but interrelated tasks and concerns. These tasks often entail access to, and the use of information and equipment, which is only partially accessible to others; resources that are an essential

component of the tasks' progress and accomplishment. Moreover, during the course of the operation, there may be neither the opportunity nor the possibility of informing colleagues as to significance of a particular event or even what might required at a particular moment. The operating theatre provides an excellent opportunity to examine how activities are organised and continually configured to produce complex forms of interaction between multiple individuals with different levels of experience and expertise.

These issues bear upon the commitment with the analysis of situated human conduct and practice in a corpus of naturalistic workplace studies that emerged through the pioneering work of Lucy Suchman (1987) and Lave and Wenger (1991). This body of research has included studies in workplaces such as air traffic control (cf. Harper and Hughes 1993), urban transport centres (cf. Heath and Luff 1992), airport ground operations room (cf. Goodwin and Goodwin 1996), navigation bridge command (Hutchins 1990), and dispatch centres (Whalen 1995). One of the motivations of these workplace studies was to describe through detailed ethnographic studies how work is accomplished in collaboration between participants who may be engaged in distinct and distributed, and yet highly interrelated tasks and activities. Many of the studies have revealed how multiple individuals with different concerns and responsibilities engage in complex forms of participation and delicately coordinate their activities with the real-time contributions of others. One pervasive aspect of work pointed to in these studies is the ways in which the smooth coordination of work in complex organisational settings relies on members learning to organise their attention and participation with regard to the activities of others and the significance of particular events and problems (e.g. Goodwin and Goodwin 1996, Goodwin 1994, Suchman 1993). Despite the pervasive relevance of learning in practice in operating theatres, save for a few exceptions in other related fields (e.g. Nardi 1995, Mondada 2001, Koschman and LeBaron 2002), it is surprising that the operating theatre setting has remained relatively unexplored as a resource for the study of observational learning in communities of practice.

In this paper we wish to consider the operating theatre as an ecology of instruction and training, and examine the ways in which trainee surgeons are given the opportunities to discuss cases and are provided with the resources to see and make sense of particular phenomena, whilst preserving the emerging demands of the operation's procedure. We will consider how seeing and making sense of the phenomena, in this case, provide resources for engendering sequences of action; sequences of action that reveal a routine procedure or practice. We explore the differential forms of participation that arise, with and around these instructional sequences; participation that demands differential contributions from a range of participants, including the surgeons, the trainees, the anaesthetists, and the scrub nurses. In examining these complex forms of mutual engagement we are considering the ways in which the participants organise their contribution and place in the organisation of the instructional activities with regard to each other, the setting, and the structure of practice and procedures.

This paper draws on materials from a wide-ranging study of work, interaction and collaboration in operating theatres in a hospital in London. Whilst the study began with an

interest in anaesthesiology and advanced technology in the operating theatre, it developed a more specific concern with interaction and co-participation between the members of the surgical team (see Sanchez Svensson 2005). Our approach to data collection and analysis draws on the tradition of using video recording for sociological investigations. The video recordings have been augmented by more conventional field work, including field observations, interviews and discussion with the participants. The benefits of audio- and video recordings have become particularly relevant within the corpus of workplace studies as data for sociological studies and in particular to study the way in which visual conduct and the material environment features in conduct and interaction within complex work settings (e.g. Jordan and Henderson 1995, Heath and Luff 1992). Audio and video data provide opportunities for detailed scrutiny of the participants actions and activities on a momentarily basis.

Concrete cases: instructional activities in the operating theatre

The operating theatre is a work environment that is developed and furnished both as a platform for a productive activity and as an arena for learning and development. The contemporary versions of apprenticeship in the operating theatre involve a structured training programme during which the students work extremely hard to obtain sufficient experience from practice and pass the necessary examinations. Initially, there is a year of pre-registration clinical experience where newly qualified doctors gain their first experience of working in hospital medicine. Part of this period is the time when many trainees choose between careers in general practice or hospital medicine, and within hospital medicine between a medical or surgical speciality. For those that follow the surgical path, for example, the training begins with basic surgical training involving broad initial training in surgery with the knowledge in those aspects of medicine and generic skills common to all varieties of medical practices. After two years of basic surgical training the trainee then takes a post in one of the surgical specialities. This period of training, called the higher surgical training, is done in the specialist registrar grade where trainees expand their clinical experience, take on increasing responsibilities and develop a specialist interest. Higher training takes five or six years and once all training has been completed and all examinations have been passed, the trainee can enter the specialist register and apply for a post as a consultant.

One of the most significant aspects of the training in teaching hospitals is the opportunity to join the senior surgeons, and their mentors, in the actual operating theatre environment. The general knowledge gained from reading textbooks/handbooks or attending school lectures only provides the learner, and the becoming operation team member, with abstract knowledge about the task-specific skills and competencies. Surgery requires a fine mix of intellectual and manual skills that needs to be gained in close engagement with the professionals and the trade as practised. Surgery requires a profound knowledge of physiology, biochemistry, pathology and anatomy that cannot be learned without the necessary engagement with the actual cases.

That is, concrete example of the general knowledge of anatomy and pathology gained from the literature and cases that provide an understanding of the physical approach to the exposure of the pathology and the treatment of the disease.

The responsibility of the senior members is to provide opportunities for the students to participate more actively in the surgical operation. This may involve the surgeon in showing trainees how to perform particular procedures during minor and routine cases, and providing the more experienced trainees with an opportunity to perform the incision or other minor or less critical parts of the operation under the supervision of the surgeon. More common, however, is that students are invited to participate more or less as peripheral observers, in particular when the surgeon is engaged in more difficult and demanding operations (see figure 1). For example, medical students are usually present to gain a general experience of hospital medicine, surgical trainees join the surgeon to learn as much as possible from the particular case and the speciality of the surgeon, and other colleagues accompany the surgeon to continue their professional development as part of learning new skills, giving lectures and undertaking research.

Figure 1. *Surgical trainees and medical students participating together with the surgeon during the surgery in the operation room*

When performing the operation the surgeon does not remain passively disengaged from the students, but is actively engaged in providing comments and descriptions for those gathering around the surgical scene. Even though it is pertinent and useful in its own right to have the opportunity to view the surgical phenomena and observe the conduct of the surgeon, the instructional conversation augments the learning experience. For example, sometimes the surgeon goes to considerable lengths to articulate and demonstrate the anatomy of the area of the disease and the intervention, involving elaborate characterisations and descriptions of the disease and the associated problems. When a disease process is involved, for example, the surgeon may want to spend some time on talking about how the disease has emerged, and is developing, and how it is causing problems for the patient in everyday life. This may lead the surgeon into discussions about the approach to the problem and the considerations of the

range of possible treatments. Commonly, the surgeon talks about the results from previous operations, the improvements that the current procedures can reveal, and what may be expected and anticipated in the long term. Thus, the surgeon is not simply relying on the students to be able to draw experience from the concrete cases only through observation, but is gradually inviting the students to notice and understand particular circumstance and stages of the case at hand as practice unfolds. Participation and learning becomes possible and meaningful experience through the encounters with the surgeon as created and occasioned within the context of the exigencies of an actual ongoing operation.

Creating opportunities for participation and learning

For those that have been granted access to the operating theatre as medical students, surgical trainees or senior colleagues - gathering around the surgeon and listening to the surgeon's talk and descriptions, following the progress of the surgical procedures, and observing the communication between the team members – provides important resources for learning. However, the participants face an interesting problem. During the surgical operation, it is not always possible, and sometimes inappropriate, for the surgeon to interleave the physical activities of the surgical procedures with instruction and discussion. Moreover, the space required for the surgeon to undertake the procedures makes it difficult for others not directly engaged in the surgical conduct to view the surgical field and follow the progress of the operation. The difficulties for the participants, and in particular for the surgeon, is to organise for their mutual engagement and participation so as to provide the possibility for talk, discussions and viewings of the surgical field, without disrupting the smooth running of the surgical operation. Therefore, it is overwhelmingly the surgeon who initiates and maintains the dominant communication during the surgical operation. As we can begin to see in the previous fragment, on a regular basis during the surgical operation, the surgeon initiates and create opportunities for the students to engage in discussions and share the viewing of the surgical field.

Let us consider some examples. In the first instance, we join the operating team during a case involving the clearing and widening of the interior areas of the patient's throat. The patient has earlier had an operation involving the removal of the larynx - the part of the throat that plays a critical role in normal breathing, swallowing, and speaking. Once the larynx is removed, air can no longer flow into the lungs. The upper portion of the trachea has therefore been brought and secured to an opening on the throat, making a permanent alternate way for air to get to the lungs. On this particular occasion the surgeon has decided on operation because of infections and scar tissues from the original operation and the long-term use of an artificial airway tube. Due to this disease and illness, the inner area of the throat has become very tight, making it difficult for breathing. Sean, the surgeon, is just finishing a particular stage in the surgical operation in which he has removed tissue and cleared the trachea and the bronchos (the area in the throat where the windpipe splits into two). In the scene is Gerry, the

scrub nurse, standing to the right of Sean. Mark is a surgical trainee that has just joined Sean to learn from the case. Further away from the surgical scene is Michael, the anaesthesiologist.

When we join the action in the operating theatre, the surgeon has just inserted the long telescopic lens (the bronchoscope) through the airway opening (see 1.a). The surgeon looks down through the bronchoscope and examines the throat. With the students patiently waiting next to him, he starts to describe what he can see and makes a characterisation of the gradual improvements of the condition in the throat. He then raises his head and turns to the scrub nurse on his right and voices an instruction to the scrub nurse concerning the next set of instruments (1.b). In waiting for the instrument, the surgeon takes the opportunity again to raise some issues about the current case (1.c).

Fragment 1. *Transcript 1*

Sean: Ahhh:: its good (0.8) the who::le trachea is gra::dually improving and the (left bronchos) is (half as wide again as it was)

Mark: mm::

Sean: It is not s:: (horribly) stenosed no:w (0.2) its (___) its almost reasonable

(1.5)

Sean: °Which i::s:: nice°

(1.0)

1.a

Sean: Okay (0.3) so the dilators (0.2) plenty of (clay gel) Gerry I like to start with si:::ze (0.3) twenty six please

(3.0)

1.b

Sean: I have told you many times I am not a great fan of dilation but I =

Mark: mm::

Sean: =think (.) really with this lady just steadly steady gently gently

Sean: (every new bit of trauma you cause) (0.8) is not a (0.8) not a (step forward basically)

(3.5)

1.c

The case description runs continually in parallell and within the emerging course of the surgical intervention. The surgeon has examined the throat and has something relevantly new to reveal. However, the students do not have direct access to the visual field and maybe not a clear understanding of what the surgeon is looking at and what might be expected at this point. The surgeon's talk, therefore, serves to invite the participants to experience some of the excitement about the gradual improvements of the throat and the considerations involved in the current stage of the operation. The opportunities for participation and mutual engagement is created and managed within the practical and collaborative context of the surgical activity. The participants are not simply engaged in an instructional conversation. It is a conversation that is an integral part of an instrumental activity and the exigencies of an ongoing surgical operation. The surgeon initiates and builds moments within the current activity to provide opportunities for the students to experience the case; resources that enables the surgeon to configure how they perceive what is done and what can be seen at the moment. This is the interactional context within which their participation and learning becomes possible, meaningful and relevant. We will return to this issue in more detail later.

One of the disadvantages for observational learning in this and many other cases is the technological limitations; the use of the telescopic lens allows only one participant at a time to the view the surgical field. However, the opportunity for other participants to share the viewing is usually worked into the procedures and provides a resource for others to engage more closely with the senior member. Take our instance again as an example. The surgeon is using the bronchoscope to examine the condition in the throat. The surgeon has mentioned in passing a few words about the patient and the condition. In particular, the surgeon has explained that there is a "sort of a shelf" down the throat that has caused some of the breathing problems for the patient. When we enter the action, the surgeon has just inserted the

bronchoscope through the opening in the throat for the first time. As he enters the surgical field, he invites the trainee to inspect the visual scene.

During the last minutes or so the trainee has been waiting for the surgeon to prepare for the surgical intervention and remains in a position slightly at distance from the surgeon (2.a). As the surgeon inserts the instrument and utters “Yep ... there is the little she::lf:”, the trainee starts to move to another position behind the surgeon (2.b). A moment later, the surgeon leans backwards and says “you can see… ". At this point, the trainee is already on his way behind the surgeon and as the surgeon says “where its so narrows”, the trainee bends down over the instrument and examines the visual scene (2.c).

Fragment 2. *Transcript 1*

Sean ▼ Peter ▼

2.a

2.b

2.c

inserts instrument ▼ ……. moves up ▼ ……..

Sean: ▲----- Yep (0.3) theres is the little she▼::lf: -------▲you can see where it ▼ s:o na:rrows

Peter: ▲ ……. .....▲ ……

moves behind bends down and examines

A minute or so later in this instance (see transcript 2), the surgeon is leaning down again over the instrument to inspect an area further down the throat, namely at the bottom of the throat where the windpipe splits into the two arms of the bronchial tree (2.d). Again, when the surgeon produces the next utterance, the trainee changes his position. He bends down over the

surgeon's shoulder, preparing to look down the scope again when the next opportunity arises (2.e).

Fragment 2. *Transcript 2*

2.d

2.e

```
                                  move instrument down and
        inserts instrument        shifts body orientation in chair
        ⮟                         ⮟
Sean:   ⮝----- And then:::: --⮝down:: the botto⮟ m
Peter:                                          ⮝ ……————————————
                                                bends down over the surgeon's shoulder
```

In both of these last two instances we can start to recognise how the surgeon explicitly and more delicately implicate the participation of the student – he opens opportunities for the student to join the surgeon within the framework of examining the visual scene. It is noticeable that the student remains silent and relatively patient until the surgeon displays the relevance for him to participate more actively in the scene of action. One of the ways in which the surgeon seems to implicate some form of participation for the student is in and through the vocalisation of his visual observation of the surgical phenomenon. He animates the discovery, which serves to invite the student to engage in the viewing. The opening line "Yep (0.3) there is the little shelf" is interesting in the ways in which it seems to relate to an earlier discussion during which the surgeon claimed that there is a "sort of a shelf down there". Here, however, the surgeon initiates a demonstration of what he previously has only been claiming. Seeing and hearing that the surgeon now gradually gears into a demonstration of the visual scene, the student moves to another position from which to be able to respond to such an opportunity.

Interestingly, in this last instance, it can be noticed how the trainee responds to the ways in which the surgeon animates bodily and vocally what he is looking at and where. He makes it

audible and visible that he is now looking further down the throat - in fact, all the way "down::: the bottom". It can be noticed how the surgeon, when making an emphasis on "down", pushes the instrument further inside the throat and makes a slight change of his position in the chair. The action of the surgeon seems to display for the trainee that he is not only taking another look; he has navigated to another area of the throat and is now looking at something different. The bodily conduct of the surgeon does not pass unnoticed. The trainee immediately responds to the action by bending down over the surgeon's shoulder. A brief moment later, when the surgeon raises his head, the trainee bends further down and examines the bottom area of the throat.

The invitations and delicate encouragements to participate and learn is strongly embodied and embedded in the actions and activity of the surgeon. The posture of the surgeon when looking down the instrument seems to shape the action of the student in particular ways. We can see, for example, how the student in the first instance moves to the other side of the surgeon. He moves into a position that seems to provide the best opportunity to accomplish the practical action of bending down and looking, considering the current placement of the instrument and the bodily orientation of the surgeon. This is particularly evident in the next instance in which the expected position of the student, when looking down the instrument, seems to be embodied in the instruction and appearance of the surgeon. The shift of body orientation in the chair, when he moves the instrument further down the throat, does not only seem to encourage the participation of the student, but to indicate a particular position for the student in the scene. The surgeon sets up the environment for the next activity - the opportunity for the student to access the instrument and examine the visual scene.

The delicate ways in which the student is provided with access to ongoing practice, might appear to be made possible by the differential status of the participants - as master and student. However it may have at least as much to do with the ways in which the participants orientate to the interactional situation at hand. Whilst the surgeon has some obligation to teach those around him, the main responsibility of the surgeon is to perform a routine procedure. The student, who's main role in this particular case is to learn from the experience of the surgeon, has only a general understanding of the problem at hand and has no direct access to view the surgical scene. Only one at a time can examine the scene and it is not always appropriate to talk or engage in a shared viewing. Moments for learning and participation emerge in and through the interaction between the participants and as the case develops. We have seen how the surgeon creates these moments of mutual engagement and how the student is sensitive to emerging opportunities to participate and learn.

Securing seeing: displaying alignment

Whilst once having occasioned and created an opportunity for students view a particular aspect of the surgical phenomena, the surgeon commonly engages in configuring their seeing. The surgeon commonly elicits responses from the participants to secure their seeing and

understanding of particular phenomenon. In the materials from the operating theatre, it can be observed that demonstrations commonly involve progressive modifications of descriptions and references to align the trainees' orientation and participation to be able to make sense of the phenomenon (for similar issues cf. Goodwin 1994).

The encounter between the surgeon and the student in our previous example illustrates this point. The student has been given the opportunity to examine the interior of the throat through the instrument and has been encouraged to see "where it so narrows" (2.f). This description from the surgeon is a rendition of what he has seen himself, but also a description that may work for someone else seeing the 'same' thing. The student remains silent whilst looking, which seems to encourage the surgeon to continue the description and emphasise that "you can see the shelf and mucus there" (2.g).

Fragment 2. *Transcript 3*

2.f

2.g

Sean: where it s:o na:rrows ---------- (you can see the) shelf and mucas there
Peter: --⮟--m:mm
……..……..……..……..……⮝ ……
looks through the instrument head up

The absence of any kind of response from the student appears to encourage the surgeon to upgrade the description of the visual scene and to secure that the student actually can see the phenomenon pointed out. His next utterance is an attempt to help the student to see the "shelf and mucus" and to elicit a response from the student that may indicate whether he has seen something or not. As he finishes the utterance the student raises his head and responds with "m:mm" and a delicate nod. The surgeon has finally received an acknowledgement and the

participants have secured the 'shared' viewing ad understanding of the visual scene; they have managed to create and sustain an important learning opportunity.

The following fragment from another surgical case illustrates the point perhaps more clearly. This example provides a slightly more complex situation. The surgeon has a much larger audience and the surgical phenomenon to be described is very complex and difficult to see at a distance and without guidance from the surgeon. What the participants are looking at is an open wound in the area of the frontal sinus over the eyebrow. The surgeon has used the drill and various other instruments to open up into the frontal sinus, where participants can see the tumour, called an oesteoma, that has grown out from the bone structure in the cavity of the frontal sinus

On this particular occasion, two surgical trainees (Joan and Peter) have joined the operation to function as assistants to the surgeon (Maria) and to develop their experience of the surgical case. Present in the operating theatre are also two medical students in their first grades (Karen and Jenny) who participate more in terms of getting a general experience of surgery and working in operating theatres. Until now, the surgeon has been unable to provide any explicit instruction or guidance because of the demands of the procedure at hand (3.a). We join the action as the surgeon stops the drill and places the suction tip in the particular area of interest and produces the utterance "Can you see the line there" (3.b). The question occasions a reorientation by Jane and Peter; they move their heads forward and look towards the surgical field (3.c).

Fragment 3. *Transcript 1*

3.a 3.b 3.c

Maria: Can you see the line there

The reorientation by the trainees, whilst engendered by the question, does not appear to provide the resources to enable the surgeon to believe that they have discovered the line and location of the oesteoma. A second or so later (3.d – transcript 2), she specifies the location of the line, 'the little line here (lying) around it', and Jane responds with 'yes', and a moment later the surgeon attempts to elicit a response that displays, rather than claims, discovery of the line – 'do you see it at the bottom there?'. Despite orienting further towards the scene of