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SOCIAL INNOVATION: THE PROCESS DEVELOPMENT OF KNOWLEDGE-INTENSIVE COMPANIES

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July 2012

Technical Report # DISI-13-030
Version 1.0

Published also: *International Journal of Services Technology and Management*

Abstract: The new service development of knowledge-intensive companies in emerging economies is changing from processes with only economic goals to processes that combine economic and social needs. In this approach, processes are socially constructed through society, aiming at achieving innovation success. The main research goal is to explore how companies organise the development process of new services in order to achieve the economic and social needs. More specifically, how companies develop social processes that enable innovation supported by relevant social groups, in order to cope with latent social needs in emerging economies, and keep the competitive advantage under turbulent conditions? The main finding is the presentation of a model for process development of new services of knowledge-intensive companies in emerging economies. The integration of lead-users and relevant social groups in the innovation process can support companies in organising innovation processes for the achievement of economic and social challenges.

Keywords: service innovation; social innovation; innovation process; social challenges; open innovation; new service development; lead-users; user involvement; knowledge-intensive companies; emerging economies.

Reference to this paper should be made as follows: Battisti, S. (2012). Social innovation: the process development of knowledge-intensive companies, *Int. J. Services Technology and Management*, Vol. 18, Nos. 3/4, pp.224–244.

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1 Introduction

The domain of vehicle security service in emerging economies presents social and managerial challenges that could be addressed through new alternative ways in doing service innovation, as discussed by Battisti (2012). The main factor that has motivated the interest of companies in the development of new services is the latent social needs. Companies can develop alternatives for solving the problem of vehicle robbery and kidnapping in large Brazilian cities. Recent studies in emerging economies, such as the ones in Brazil, show that pressing social issues is the main driver that companies must take into consideration for the development of social innovation (Hall et al., 2011).

The growing interest for emerging economies also comes from the field of innovation research and new product development (NPD). Barczak (2012) argues that the main emerging priorities to be explored are the analysis of service innovation and social innovation, aimed at solving substantially increasing social problems faced by the society today. In helping organisations to improve innovation processes Barczak (2012) suggests that researches could explore a combination of service innovation, open innovation and social innovation paradigms. This is evident from the rising number of researches carried out on emerging economies in the field of innovation research, especially in the Brazil, Russia, India and China (BRIC).

In emerging economies studies could be carried out taking into consideration the turbulent conditions caused by the economic growth. Under hypercompetitive conditions, the intensity of collaborative innovation between actors must increase continuously, in order to sustain innovation success rate. D'aveni et al. (2010) explain the causes for this include the constant change in the dynamics of the environments, which are rapidly becoming unpredictable and ambiguous.

Development of innovation processes based on solving social challenges could be a possible alternative to support companies to cope with the social and economic requirements for sustainability. The innovation processes must take into consideration the environmental changes from society (e.g., new social problems) and from the hypercompetition between companies (e.g., new services to cope with social problems). Aimed at coping with the challenges, this paper states the new service development could be viewed as a process in which companies organise their internal and external resources to attain the user's social needs. This could readily be addressed through the diffusion of social innovations into emerging economies.

Establishing a collaborative network of knowledge-intensive companies gives way to organise and compete in current emerging economic conditions. This network setting could possibly be more appropriate for organisations to cope with the development of social innovation for solving social

problems. This perspective leads towards the recognition of requirements to better understand the intensive interactions between actors within the process of service innovation (Miles, 2000). There is a need for these companies to be structured, in order to share the knowledge competences as the most fundamental characteristic to keep the competitive advantage (von Nordenflycht, 2010).

Taking the development of new services by knowledge-intensive companies into consideration, collaborative networks of actors could aid in the success of innovation process. Taking the perspective of product development, Cooper et al. (2002) argues that the innovation process could be viewed as a series of stages that could be considered a guide through the entire process, from the generation of the idea through to the commercial launch of an innovation. The process of new service development must include the collaboration of users (Tether, 2003) since users are a relevant source of new information for innovation. In order to set a single label in this research, the citizen, the customer and the user are all defined as 'user'.

The continuous exchange of information between companies and users is extremely important, especially when companies must keep the continuous innovation process after launching the service in the market (Sundbo, 2008). In emerging economies, the continuous integration of users in the innovation process could allow social innovation to cope with social pressing needs. Additionally, user-based innovation involves complex social processes that are embedded in conflict situations and misunderstandings in communication, throughout the innovation process (Sundbo and Toivonen, 2011).

From this perspective the main goal of this research is to analyse how companies organise the development process of new services in order to achieve the economic and social needs. More specifically, how companies develop social processes that enable innovation supported by relevant social groups, in order to cope with latent social needs in emerging economies, and keep the competitive advantage under turbulent conditions?

This paper is organised over five sections which are as follows: Section 2 presents the theoretical framework; followed by a discussion on the combined qualitative methodology based on case study research and clinical inquiry research in Section 3. Data analysis is then discussed in Section 4 and in Section 5 the results are presented along with the model for the development of social innovation in emerging economies and the related propositions for further research. Finally, Section 6 concludes the paper and presents a discussion on the main characteristics of social innovations in emerging economies and the avenues for further research.

2 Theoretical framework

The innovations developed by knowledge-intensive service companies represent a crucial role in innovation systems. In the knowledge-based economy, services do matter and they have increasingly been seen to play a pivotal role in innovation development, as suggested by Miles (2000) and Hertog (2000). In the same way, technology is especially important to enable service innovation success (Hipp, 2008). However, the role of technology in the service development process remains less explored (Agrawal and Berg, 2008). Additionally, service innovation must be designed with emphasis on the complex systems that are supported by a range of technologies and competences, as presented by Djellal and Gallouj (2008).

From this perspective, emerges the need for a clear definition for what is meant by service innovation, especially in emerging economies. Sundbo (1997) discussed service innovation is a new service which provides benefits for organisations that develop this innovation, in order to address the needs of users. Service innovation is the final goal of knowledge-intensive companies, where the companies are able to organise the development of the innovation process through the whole social system.

The organisation of appropriate innovation processes in emerging economies is fundamental for the competitive advantage of companies, especially when innovations are enabled by technology solutions (Battisti, 2009). The ever growing social needs in emerging economies define the companies must provide new service solutions through sustainable mechanisms. The kind of service aimed at cope with social needs could be translated into social innovation. The social innovation, as discussed by Mulgan (2006), refers to innovative services aimed at achieving social needs, and this could occur especially within emerging economies with profound social challenges.

Social challenges in emerging economies act as drivers that enable companies to organise innovation processes in order to cope with sustainable social innovation. From this perspective, social innovation is a new and significant term within the innovation research, where Pol and Ville (2009) suggest that for social innovation as an emerging field, different approaches can be applied because this innovation is different for services and products. The main goal of social innovations is the development of solutions for social problems (Lettice and Parekh, 2010).

Through the innovation process companies are developing collaborative structures for coping with competitive advantages aimed at innovation success (Chiaroni et al., 2011). Collaborative

structures are imperative for the innovation process and could facilitate knowledge sharing between actors and aid in achieving social innovation to cope with latent user needs in emerging economies.

From this perspective, the theoretical framework would be structured taking three levels of innovation process as the basis of this study: internal processes; open processes and social processes. These are discussed in more detail in the following sections.

2.1 Developing internal processes for flexibility

Organising appropriate internal processes for knowledge-intensive companies is an important factor that aids in coping with the turbulent conditions faced in emerging economies. These kinds of companies are increasingly exploring flexible processes in order to be more user-oriented in the development of innovations. Recent studies (such as Miles, 2000; Howells, 2010; Schleimer and Shulman, 2011) suggest that internal processes could potentially integrate new organisational practices and routines, which are likely to be involved with intensive collaboration in the development of services that are driven by user needs.

Specific processes, aimed at realising the innovation success, must take into account the exploitation of resources and capabilities for change (Lee et al., 2010). Additionally, Miles (2007) discussed that in service innovation, processes require distinctive approaches compared to product innovation. From this perspective, Cooper (2008) suggests that new service development could be designed using reinvented stage-gate process. Cooper (2008) extends his argument that these new stage-gates could be viewed as a series of interconnected phases in which companies organise activities in order to manage the development of service innovation. Stage-gate process has been modified to support collaborative process in reinventing the classical way of NPD process (Cooper, 2008), taking into consideration that stage-gates in service process must be designed in a non-linear way.

In order to organise internal processes for collaborative innovation, the development of flexibility stages enable higher levels of innovation success rate. In this sense, companies are increasingly implementing flexible internal processes especially when they face hypercompetitive environments. Hermelo and Vassolo (2010) argue that competitive advantage of companies in emerging economies are increasingly becoming less sustainable, and for this reason more dynamic and flexible interactions between actors are imperative. This suggests that the dynamic environment are challenging for the managers in the NPD, especially in high-tech-based sectors, where a more flexible development process are associated with high performance of companies (MacCormack et al., 2001). In addition, the continuous innovation requires new service development (NSD) process and practices in a more flexible and interactive way (Zomerdiijk and Voss, 2011).

Taking the perspective of flexible internal process, supported by MacCormack et al. (2001) and van Riel and Lievens (2004) the success of new service development depends increasingly on decision-making performance in terms of flexibility and responsiveness. The NPD perspective suggested by Cooper (2008) also stated that in order to face flexibility in the innovation process, the key activities and entire stage could be simultaneously executed. Process development must take into account a continuously redesigning and adapting of service process (Verganti and Buganza, 2005). In addition, the design of internal process may depend on the turbulence of the market in which the innovation is developed (Zomerdijk and Voss, 2011).

There is an ever growing uncertainty that companies face. Flexible processes could be developed taking into consideration that different types of services may require different and new service process and practices (Zomerdijk and Voss, 2011). Furthermore, uncertainty and complexity occur in different forms and at different levels during the internal process (van Riel et al., 2011; Goldhar and Berg, 2009). This uncertainty is increasingly pushing companies to improve continuous routines which in turn enable flexible processes, especially in emerging economies where the level of complexity and turbulence are growing rapidly.

2.2 Developing open processes with user involvement

The development of open processes is based on the integration of collaborative networks of companies taking into consideration the user's involvement. This enhances processes in order to deal with innovations in emerging economies. From this perspective, recent studies about collaborative innovation as Gassman et al. (2010) discussed that the era of research in open innovation has just began, and that open innovations can start with simple outsourcing deals with contract service organisations to overcome constraints and improve competitive advantages.

Open processes, as defined by Chesbrough (2003), represent the development of innovation through inter-actors accumulation of know-how through learning outside of the company. Chesbrough (2003) added that open processes could occur through the integration of suppliers, users and several other types of partnerships within a network of companies, forming a complete open innovation system. Additionally, it is important to analyse open innovation processes, taking context dependency into consideration (Huizingh, 2011). The collaborative processes are based on network structures for service

innovation (Hipp, 2010). The innovation in services could be considered as a loosely coupled system (Sundbo and Gallouj, 2000). Hertog et al. (2008) support these arguments and add that services are an integral part of innovation systems.

The level of a company's openness refers to how their internal resources are shared with the external environment (Dahlander and Gann, 2010). Maintaining and sustaining an external

network of competence is a critical point (Chiesa et al., 2004), since the need of service companies are interconnected with the users.

An open process could be realised through information exchange within or between collaborative networks of companies, where the continuous need of service development must be directly oriented towards user involvement. Innovation success could be achieved through several different realisations of open processes. For this, it is imperative companies adopt new ways to participate in networks. This becomes even more significant when new technologies drive the most appropriate ways for collaboration, while taking into consideration the unique capabilities that each of the companies could bring to the network (Pisano and Verganti, 2008).

Moreover, service innovation involves the interaction of several resources and actors (Miles, 2011). For this reason, the service systems must be taken into consideration the role of organisation as knowledge-intensive service companies. These companies could access external technologies, aiming at the support of the open innovation process (Chiesa et al., 2008). This suggests that the managers could develop the ability to structure an open network of companies, in order to identify and exploit new knowledge (Chiaroni et al., 2011).

Standardisation of open process is imperative for new service development (Ettlie and Rosenthal, 2011), because companies could better formalise innovation process that involves users in interactive way. In addition, more radical service innovation leads to more structures that require organisation in order to integrate users as a source for successful innovations (Ettlie and Rosenthal, 2011). Raasch et al. (2008) discussed that innovation with users could be sustained over long periods of time and in more dynamic environments. Similarly, Sundbo and Toivonen (2011) discussed that a user-based approach is an important success factor for service innovation and Carbonell et al. (2009) and Edvardsson et al. (2012) discuss the importance of information provided by users be taken into account in a way in which companies could continuously learn and use the new information to change the service innovation.

Taking into consideration the continuous learning of companies in open process, the interaction between users and service companies tends to be shaped through longer period of time (Dolfsma, 2004). However, an open innovation process must continue after the launching of knowledge-intensive service in the market (Sundbo, 2008). The continuous interaction could be guaranteed by the lead-users integration in the collaborative processes. Through the need of companies to establish tools that enable user co-creation for innovation. Lilien et al. (2002) and Franke et al. (2006) discuss that the lead-users could be extremely useful in rapidly-moving markets where breakthrough technological innovations emerge. The importance of service innovations through integration of lead-users in open processes was also underlined by Skiba and Herstatt (2009).

2.3 Developing social processes with relevant groups

The integration of relevant social groups in the collaborative network of companies gives way to developing social innovation that is focused on solving social problems. The understanding of the real meaning of social needs, when obtained from relevant social groups, could be the most important driver for companies in the innovation success. This significance grows when considering the role of information and communication technologies (ICT) in enabling innovation that is aimed at solving social problems. Following this line of thought, Verganti (2011) discussed that radical technological changes could enable companies to search for new technologies that might be more meaningful for a single individual, social groups and the society, on the whole. This suggests that these new technologies could enable a social groups' involvement in the whole process of developing service innovation, in order to cope with the solution of social problems.

Moreover, Bijker (2010) suggests that the technologies could be considered as powerful forces in the reshaping of society activities and their meanings. Bijker (2010) extended the argument that technology is one driving force in the organisational change, where the interactions between companies and social groups can shape meanings and actions of people throughout the society. Similarly, the users are a part of the social system with cultural reference groups, and in order are essential when there is a need to analyse the social groups (Sundbo and Toivonen, 2011). Furthermore, technology is socially shaped through factors regarding social, organisational, economic and political needs (Bijker, 2010).

In order to develop an understanding of the needs of a society throughout the social process of innovation, Verganti (2008) suggests that companies must interpret the hidden meaning of the social system through the concept he defined as design-driven innovation. It could be viewed as a social process, based on sharing knowledge between companies and social groups, about social and cultural meanings.

The lack of understanding about the market by the companies is the main problem that should be taken into account for innovation success (Goffin et al., 2010). From this point of view, they suggest a deeper analysis of hidden society needs in order to lead companies to formulate a deeper understanding of the value of innovations for the society. In this sense, the social process must be guided by social challenges through the satisfaction and understanding, and by involving users in the innovation process.

In the development of the social process, the companies interested in carrying out social innovation must ask the potential users how they would solve their own problems (Mulgan, 2006). In addition, Lettice and Parekh (2010) discussed that companies which make the social process more explicit, transparent, and well organised in terms of formal routines, could increase the success of the innovation as a whole. However, the information that comes from the society must be structured, elaborated, interpreted and integrated inside companies (Sundbo and Toivonen, 2011).

From this perspective, the relevant social groups could have different perceptions of different innovations, especially products and services that are based on technology. The dominance of one technology over another is related to the convergent meaning that this technology would be observed through the process of social construction (Bijker, 2010). In addition, social process must take into consideration the role of technology within the entire social and technical systems, in shaping the social innovation (Bijker, 2010).

Integrating the perspective of the management of social entrepreneurship, could be a way in which process can be organised to combine economic goals with social goals, which could be achieved through radical innovations. This could prove fruitful in the development of companies that guide social innovation (Witkamp et al., 2011). Additionally, Mulgan (2006) supported this by discussing that social innovation could be driven by competition in open systems, where social entrepreneurs are faced with new opportunities.

Taking into consideration the service innovation perspective in the achievement of economic and social needs, Dacin et al. (2011) states that social entrepreneurs could create value for society through the development of process that could aid the social innovation to cope with real problems of the society. Lettice and Parekh (2010) followed this perspective and discussed the social innovators that must manage a higher quantity of stakeholders, which have different mind-set, goals and priorities. This could present a challenge for the managers while mediating conflict of interests.

The role of companies in management of different stakeholders in the process of social innovation leads to satisfying the common goal of increasing well-being. Mulgan (2012) discussed this point of view and elaborated that innovation gains impact through formalising. He further discussed that the dynamic processes, of externalisation and internalisation of the resources are an indication that innovations are socially recognised as an agent of value creation and promotion of social well-being. However, Nicholls and Murdock (2012) argued that social innovation is political and socially constructed since it has a direct impact on people, and from this perspective, it could aid in the improvement of human well-being.

3 Methodology

For the accomplishment of the present research, it must be taken into consideration that collaborative innovation process involves several different actors and complex interactions. Thus new methodologies of research analysis could be explored in order to better understanding complex phenomena. Following this perspective, Sorensen et al. (2010) explained that the complexity of

innovation processes in certain kinds of industries could involve particular approaches which may include different research methods and data collection techniques.

For this line of thought, the present research applied a methodology that combines case study research and clinical inquiry research. This combined approach can potentially increase the interaction between researchers and practitioners in the research process. Taking the case study research point of view, Yin (2009) argues that the investigation of a phenomenon and its environmental context could be done through an in-depth analysis of empirical evidences. On the clinical inquiry research perspective, Schein (2008) discusses that the researchers play a central role in the inquiry of companies, followed by the principles of keeping a link between the researchers and the users, especially during hyper-turbulent environmental changes.

3.1 Categories of analysis and research activities

The following categories of analysis were employed in order to support in understanding the phenomenon and to analyse the empirical data, as presented in Table 1.

Table 1 Categories of analysis

<i>Categories</i>	<i>Description</i>	<i>Main references</i>
1 Internal processes	Companies can reinvent stage-gate processes for collaborative innovation, designing gates in a non-linear way. Processes are standardised in a more flexible and interactive way. The constantly redesign based on the uncertainty that pushes the companies to develop continuous routines can, enabling flexibly internal processes.	MacCormack et al. (2001), Verganti and Buganza (2005), Cooper (2008), Goldhar and Berg (2009), Zomerdijk and Voss (2011) and van Riel et al. (2011)
2 Open processes	Companies can organise collaborative networks taking into consideration the context dependencies. Open processes occur through the integration of companies with several types of partnerships. Continuous interaction with companies could be done by the integration of lead-users in processes with rapidly environmental changes.	Chesbrough (2003), Franke et al. (2006), Chiesa et al. (2008), Huizingh (2011), Chiaroni et al. (2011) and Sundbo and Toivonen (2011)
3 Social processes	Companies can understand the meanings provided by socially relevant groups, where technologies can act in reshaping of society activities and their meanings. Managers interpret meaning from stakeholders with different mind-set, goals and priorities. The innovation can create value and promote social well-being.	Verganti (2008), Goffin et al. (2010), Lettice and Parekh (2010), Bijker (2010), Dacin et al. (2011) and Mulgan (2012)

From these categories of analysis the research could be considered exploratory and designed to be verified on the empirical field of vehicle security services in Brazil. In this context, the group of

knowledge-intensive companies (now defined as ‘The Network’) is the unity of analysis for the in-depth study. The main research activities are presented in Table 2.

Table 2 Set of research activities

	<i>Research activities</i>	<i>Timeline</i>
1	Analysing latent social problems in emerging economies	September/05–October/05
2	Analysing current social innovations and social groups	October/05–April/06
3	Analysing knowledge-intensive companies and goals	May/06–August/06
4	Carrying in-depth interviews with top managers	September/06–February/07
5	Observation of the processes of social interactions	February/07–March/07
6	Acting by intervening on meetings to problem solving	March/07–December/07
7	Acting by analysing companies’ performance in the market	December/07–January/08
8	Acting in real-time considering market and social changes	January/08–February/08
9	Acting in solving social problem with social groups	February/08–February/09

3.2 *Sample description and data collection*

Aimed at understanding the innovation process of the knowledge-intensive companies, it is imperative to describe the research sample and the process of data collection. ‘The Network’ was officially established in early 2005 by three small-medium sized companies in the southern region of Brazil, Perto, Magaldi and Neoset.

The Perto Company is located in the city of Gravataí-RS and is the second biggest bank automation company in Brazil with 800 employees. It holds market shares at about 30% of the Brazilian market for bank automation, and is controlled by a holding known as Group Digicon. The Magaldi Safety Group is located in the city of Porto Alegre-RS. They specialise in safety solutions, sales of weapons and the training of shooters. It holds a database with more than 24,000 students and holds a shooting club with more than 1,500 active members. The Neoset Engineering Group is located in the city of Porto Alegre-RS. It was founded by an engineering team specialising in service innovation solutions based on mobile communication systems. It operates on the design of new service development processes, and service innovation based on high-technology in the business strategy.

From the sample characteristics, the combined research method was designed to aid in better understanding of the development process for social innovation in emerging economies. The case study part of the research included six interviews with the top-managers of the companies involved, and analysis of documents of the companies’ websites and books, as well as the participation of the researchers in the meetings of ‘The Network’. Direct field observations were carried out by mainly visiting the departments of R&D, production and marketing. To guarantee

the validity of the research, six months field-work was necessary, in the search of multiple sources of evidences, through the secondary data-collecting for the elaboration of the questions to aid the accomplishment of the structuralised research. In addition, these processes guided the conduction of the individual interviews.

At the clinical inquiry part, the researcher conducted data gathering in the formal meetings that took place weekly and lasted for about three to four hours of discussion. The interviews occurred during the conversations following the line of inquiry of researcher. The interviews were specifically undertaken by the allocating a short time for formal colloquy. The researcher presented the main questions at the beginning of the meeting and acted as a full participant during the discussion process, stimulating the data collection. The researcher also participated in meetings of 'The Network' with the relevant social groups, in order to understand the latent social needs and to interpret the hidden social needs of the society.

4 Data analysis

'The Network' was formed in order to develop a solution of vehicle security aimed at answer the pressing social needs of the Brazilian society. The design of this solution was based on the technology innovations and incorporated the most advanced standards of ICT. The development of technological artefacts, such as hardware, software, and process of interconnectivity, took into consideration the need for solving social latent problems, in terms of personal security, and to guarantee fast localization and recovery of stolen vehicles.

The social innovation also focused on the reduction of number of kidnappings in large cities of Brazil. In addition to supplying the social and economic necessities to the population, in terms of security, the service innovation also allowed the users a new opportunity to save money, considering the high costs of insurance for instance, for the cars and trucks, in the Brazilian society. From this perspective, the latent social need is the main driving agent that enables the new service development of social innovations by knowledge-intensive companies in this emerging economy.

4.1 Phase 1: understanding the latent social needs

Based on extensive experience in security and the strong relationship with social groups, the Magaldi Company identified the opportunity of business and coping with solving social problems. Associate members of Magaldi design the early requirements for a service solution, based on the latent social needs identified as the main issue in Brazilian large cities. This was done taking into

consideration the increasing number of social security problems faced by influential individuals of the Brazilian society, especially in a large city such as Porto Alegre in the south of Brazil.

The Magaldi Company designed the first release of the social innovation with a group of 12 lead-users. They presented a service innovation proposal for electronic equipment for vehicle security that could be controlled by the owner of the vehicle. This use of ICT presented high levels of complexity to be operated by users, and for this reason the process for social construction of the innovation had to be changed several times. Alternative ICT service innovations with mobile phones, were proposed with no success, because of the continuous increase in the complexity of technology, while at the same time the sense of security perception showed by users decreased.

The technological device was very sophisticated, and caused difficulties for users in understanding and exploring all functionalities of the social innovation provided by the knowledge-intensive companies. The hardware part of the artefact was complicated to use through mobile phone commands via keypad. For this reason the management of the risks in terms of a car being stolen and kidnapping taking place, was very complex and difficult to be understood by the group of lead-users. It was a negative factor stated by the users, that cause a huge impact on innovation diffusion through the communication channels. This factor was critical for the service innovation process, considering that the relevant social groups had received this information through the strong communication channels developed by lead-users.

The social innovation faced difficulties to be accepted by the social groups and for this reason the actors had entered in a contact with diverse companies for the developing solutions that allowed better understanding of the user's needs, in order to realise the solution to the social problems.

4.2 Phase 2: organising the core partners of the collaborative processes

The association of partners enabled the knowledge-intensive network of companies that were responsible for managing the development process of the social innovation in this emerging economy.

The ICT service innovation was managed by the Central office of the Neoset Company. The main idea was to demonstrate the service innovation for the problem of vehicle security in Brazil. This presentation was directly carried out with socially relevant meetings in the south of Brazil, aimed at sharing and committing with the society for an understanding of the social problems.

Further, based on meetings that took place four times per week in the headquarters of the Neoset, 'The Network' designed the whole process of new service development. The initial version of the hardware part was integrated with the ICT service solution and approved for final production for the company Perto. The new service development process enabled several interactions with the users to achieve the socially constructed innovation with the lead-users by sharing of knowledge.

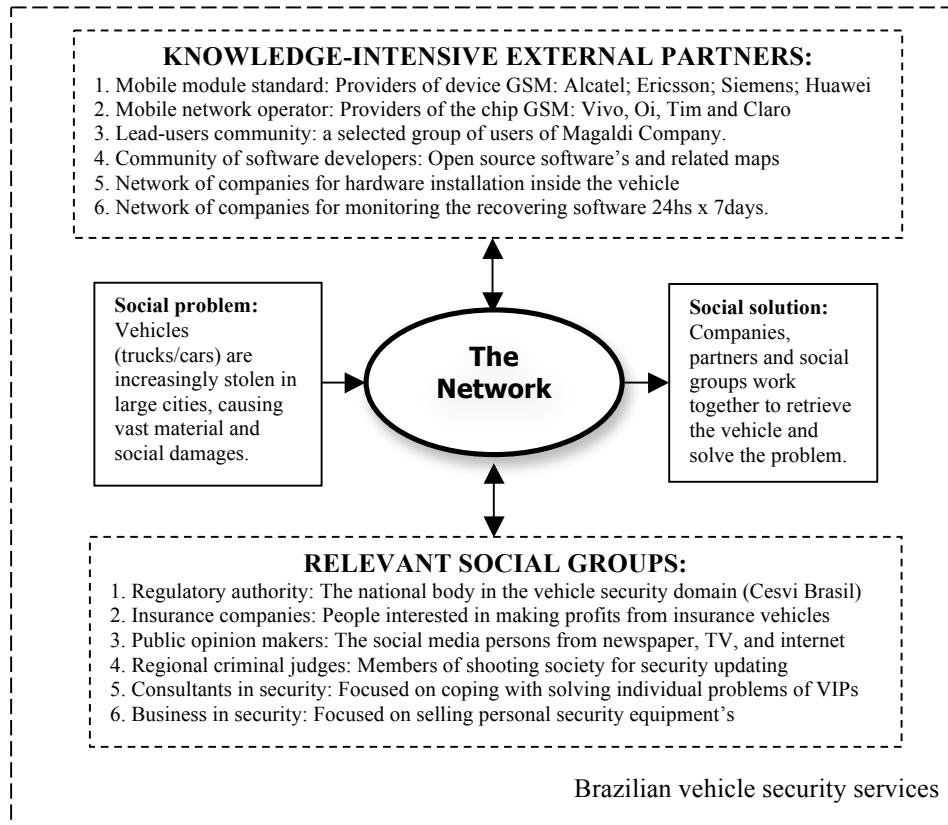
It was the main goal of 'The Network', considering that the service innovation had to keep the original features approved by the lead-users, using the concept of user-centred innovation in services. Focused at proceeding with the final testing of the commercial viability of the innovation, the service innovation solution was presented to the customers of the Magaldi beforehand. A group of previously selected lead-users, from the dataset of users of Magaldi Company, had been recalled to carry out the trials of functionality that was fully integrated in the new service development process. Based on the need to improve the service innovation performance in this emerging economy, several changes within 'The Network' were implemented.

In this new service development process, each company of 'The Network' had a formal and precise role. The main role of the Magaldi was to supply consultancy of security to the Neoset, in terms of sharing knowledge about their experience with security services in Brazil. The Neoset had assumed the role of supplying technical consultancy for the development of ICT service innovation solution, and to act as the integrator of the social innovation as a whole. In addition, this supported the Magaldi Company in presenting the users with all of the potential ICT solutions for social innovation, focused on improving the well-being, in this case through the solution of a problem of vehicle security in Brazil. The Perto had the role of manufacturing of the hardware part of the technological innovation, and also main enabler to installation by the external partners of the device in the users' vehicles.

4.3 Phase 3: organising and developing social innovation

'The network' contacted several knowledge-intensive partners, in order to collaborate for the design of the most appropriate social innovation based on the continuous information supplied by the relevant social groups. The Brazilian social system of vehicle security presented in Figure 1, the *knowledge-intensive external partners* shows the main actors, which combined their ICT resources such as the hardware and software, strong experience in development of service in security domain, as well as installation of service solutions inside the vehicles. These expertise constructed by the collaborative network of external companies is defined as knowledge-intensive companies, especially when joined with the resources and competences of 'The Network' for providing the social innovation solution for the emerging social problems in the vehicle security domain.

Figure 1 The social system of the Brazilian vehicle security services



The *relevant social groups* are the agents of change in the vehicle security service in the Brazilian society. These groups take a central role within the social system as they hold the most powerful relationships in the society and are responsible for shaping the social innovation for solving social challenges.

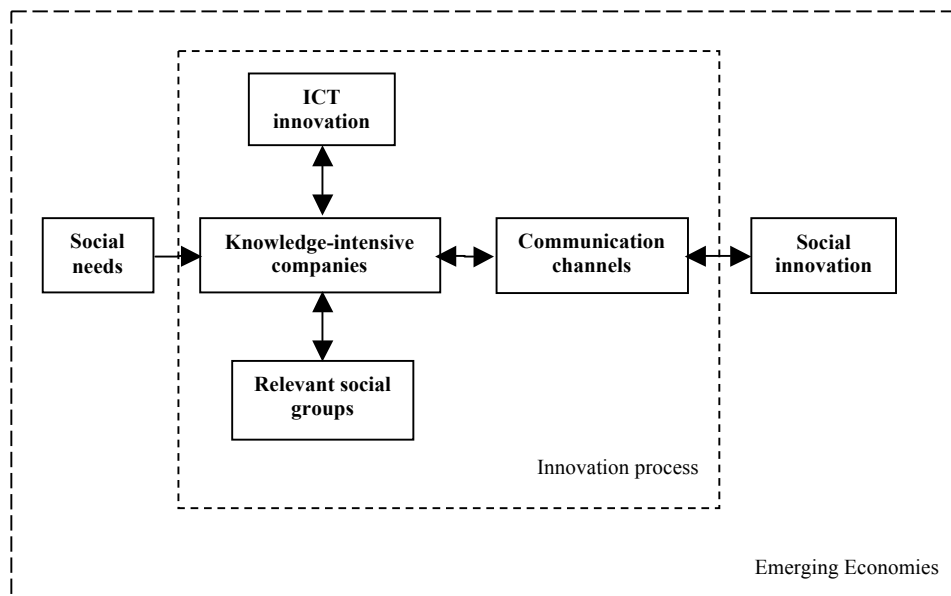
From this social system, the social needs were continuously obtained by the companies and improved into the innovation solution through the strong connection between 'The network', the external partners and social groups. It was an extremely important success factor to keep the innovation process knowledge-updated and flexible, considering the environmental changes pushed by competitors and incentives provided by the same relevant social groups.

In the social process, the Perto Company made contact with their current customers to commercialise the solution with a large insurance company (one of the strongest actor in the relevant social groups). The Magaldi Company contacted other insurance companies and relevant social groups such as public opinion makers and judges, especially the main actors that were current members of Magaldi shooting club. The Magaldi had done the certification for the technological

system in the Brazilian regulatory authority (Cesvi). The Neoset contacted other relevant social groups especially security consultants and business security companies through participating in relevant meetings in Brazil.

In this step, the state-of-the-art in ICT has been achieved with the collaborative innovation process. In addition, the proposed social innovation based on ICT has been accepted by the most relevant social groups in the south of Brazil. In this sense, the social innovation has the most advanced standards in terms of technological, economic and social characteristics. From this step the social innovation process has been developed in order to guarantee the continuous feedback between ‘The Network’ and all of the external actors. The social innovation provides evidence that the most latent social needs could be achieved in this way by carrying out innovation organised by ‘The Network’.

Figure 2 The model for social innovation in emerging economies



5 Results

From the data analysis a model of the process development of knowledge-intensive companies has been suggested, as presented in Figure 2.

- 1 **Social needs:** Are considered as the hidden needs or social challenges that are identified as the main issues that could push knowledge-intensive companies to organise innovation processes, in order to develop social innovation to cope with the social needs in emerging economies.

- 2 **Knowledge-intensive companies:** Are the core management group (fixed partners manage the social innovation) and the core external partners (not fixed partners, can be changed based on the environmental changes). In this stage, companies start to develop innovation process based on social requirements. The process of interpretation of social needs, enables companies to guarantee competitive advantages in hypercompetitive environments and at the same time aid in solving social problems. The open process enables collaborative innovation with strong partners which are technology-intensive. In this process, lead-users can interact through communication channels and provide updated information about latent social needs.
- 3 **ICT innovation:** Represents the innovation currently available in large companies, community of software developers, research centres, technological incubators, service operators, and other organisations where ICT could be considered as the main agent for innovation success.
- 4 **Relevant social groups:** Represent the most important groups (such as relevant actors outside the technological network of companies) to be connected with the knowledge-intensive companies in the innovation process. These groups must provide information about social values, updated norms and rules, in which users can express the requirements about certain domains such as security in emerging economies.
- 5 **Communication channels:** Are the strong relationships between companies and groups of lead-users in the society (e.g., external users that keep continuous innovation updated). The strengths of these communication channels are related with the social relationship between lead-users and managers within the network of companies. The lead-users help with the creation of virtuous circles between social groups and companies, in order to enable organisation structures, within and external, to achieve flexible process and update the social innovation under turbulent conditions.
- 6 **Social innovation:** Represents service solutions that cope with economic and social needs of the society. From this phase, the innovation success can be guaranteed, because the understanding of the social values of the society is fully embedded in the commercialised innovation solution. In addition, at this phase social innovation is ready to be diffused through the emerging economies.

From the data analysis and the proposed model for innovation process in this emerging economy, other results are also provided, such as the propositions for further research. The first proposition is related to internal processes and flexibility of companies. The second proposition is regarding the

open process, which combines a company's process and user involvement in this process. The last propositions involve the social innovation process as a whole and then integrates it with relevant social groups. The process of social construction of the innovation must include social, organisational, economic and political needs, focusing at the improvement of human well-being.

These three propositions are presented here, and are contextualised with the empirical evidences provided by this research.

Proposition 1 Companies that organise internal processes based on ICT, supported by flexible structures and routines that take environmental changes into consideration, increases the rate of social innovation success and well-being in emerging economies.

This means that huge number of the direct links between actors, from different companies, ensures flexibility in the innovation process. A flexible internal process guarantees real-time modification of the service innovation, to comply with user needs. The openness of collaborative processes allows faster life-cycles and reduction of the time-to-market for launching the innovations. The flexibility of processes could enable companies to take advantage of the competition even in turbulent conditions.

Proposition 2 Companies that organise open processes for selection of the network of partners, including lead-users, in order to develop collaborative processes, increases the rate of social innovation success and well-being in emerging economies.

The companies are organised with open innovation for better improvement of changes in the innovation process, in order to cope with the specific needs of users. From this the network of companies manages the innovation process within external partners, a factor that guarantees the competitiveness of the innovation in emerging economies. This process enables the exploitation of the best resources of each partner company. The collaborative innovation acts as aid to understanding the user's needs. The constant updating of the innovation was made possible because of the continuous feedback that was acquired from the users, especially since hypercompetition in this emerging economy is imperative.

Proposition 3 Companies that organise social processes to learn from the relevant social groups and collaborate in the development of social innovation, for problem solving of latent social needs, increase the rate of social innovation success and well-being in emerging economies.

Collaborative social processes allow companies to take advantage of the possibility to better organise internal and external resources, based on the social needs of society. It involves a huge number of stakeholders with different mind-sets and objectives in the process of development of the innovation. The strong relationship between managers inside the knowledge-intensive companies facilitates the involvement of social groups in the innovation process enabling the growing of the innovation success through society. From this perspective, the understanding of latent needs, of the relevant social groups, was the main focus of the innovation success. The social innovation process provided wide interaction between the social groups and aided in faster understanding of the social system. A deeper understanding of social needs enabled the innovation success, considering the support of lead-users in providing information for social groups through the communication channels.

6 Discussions and conclusions

The model and the propositions for the innovation process in emerging economies are the main contributions of this research. The model suggests that social innovation success of knowledge-intensive companies is directly related to the way by which companies organise the innovation process. The involvement of lead-users is a core element that enables the social groups to participate in the innovation process.

This model also addresses the main research question by presenting the main roots for companies that are interested in developing innovation, based on technology and aimed at solving the social challenges in emerging economies in a sustainable way and under turbulent conditions. From this point of view, the model presents significant contributions for management and for the society, as this enables companies to cope with economic and social issues.

From the manager's perspective the model enables companies to explore the most relevant actors within the innovation processes and to design structures in order to flexibly manage complex interactions with internal and external partners, lead-users and relevant social groups. The intensive collaboration between the actors is a way for sharing knowledge and designing enhanced innovation processes that enable social innovation acceptance through the society. The involvement of social groups in the innovation process plays an important role to cope with environmental turbulent changes such as social, economic and political. The model also support companies in successful development of innovation process, integrating ICT as core element of change, and is aimed at designing the competitive and sustainable innovation for solving social problems.

From the perspective of continuous integration with lead-users and social groups in the innovation process, companies must formalise organisational structures in order to keep a continuous cycle between the companies and users, also after the launching of the innovation in the market. This integration must take into account both perspectives of innovation success in the market for instance economic and social goals. The economic goals force companies to innovate for keeping competitive advantage while social goals force companies to address the social challenges.

Companies that focus on understanding latent user needs could be more suitable to organise the innovation process for problem solving. Through interpreting relationship and goals of the social groups, companies could better understand the nature of the social problems in emerging economies, which might present profound social challenges. The collaborative innovation managed by the knowledge-intensive companies could readily represent a suitable way in the development of social innovation. These companies could hold state-of-art technology and hold a strong reputation in the ecosystem. It supports vast interests of external partners with knowledge exchange, in order to contribute towards problem solving.

The main limitation of this research was the lack of a cross-country analysis, regarding security service in Brazil and other similar emerging economies as Russia, India, and China. Although these economies are considered similar, social, cultural and political issues could be very different and this can influence the innovation success, both in economic and social goals. Social problems could be diverse, considering the variation in relevant social groups, and in this sense the social innovation process could be carried out in a very different way, comparing the BRIC countries.

Another important limitation was that the findings were applied only for the domain of security services, although knowledge-intensive companies could be further explored for the application of this model in other service sectors in the Brazilian society.

The innovation research, as a field of knowledge, could be advanced with the results presented in this research, especially considering that social innovations in emerging economies, must address at least four characteristics:

- **Cope with social problems (e.g., hidden needs of society or social challenges).**
- **Be socially constructed with society (e.g., policy makers and relevant social groups).**
- **In collaboration with knowledge-intensive companies (e.g., ICT-based companies)**
- **With social processes under hyper turbulent conditions (e.g., emerging economies).**

This research represents a new way of exploring social innovation in emerging economies by incorporating the knowledge-intensive network of companies in design process for coping with social challenges. From this perspective the avenues for further research could be addressed to:

- i. Understand the nature of social innovation in emerging economies in domains as: natural resources; renewable energy; social inclusion and public transportation.
- ii. Understand the conflicts of interest in the innovation process, where actors must manage the trade-off between economic and social needs for competitive advantage.
- iii. Explore the pressing social issues that can enable lead-users support companies in the development of sustainable social innovation that cope under hypercompetition.
- iv. Explore the trade-off between competitive choices of companies and social needs, through innovations socially constructed by knowledge-intensive companies.
- v. Analyse the main drivers that enable companies to choose relevant social groups, for the understanding of the latent needs of this groups through the emerging economies.

Acknowledgements

I would like to thank Professor Fausto Giunchiglia from University of Trento for the helpful suggestions of supporting my PhD thesis and especially for the comments about social innovation enabled by ICT. Also thanks to the two *IJSTM* anonymous reviewers for their comments and suggestions which proved helpful for improving this paper. I am also grateful for the financial support by Politecnico di Milano.

References

- Agrawal, G.K. and Berg, D. (2008) 'Role and impact of 'technology' in the service development process: a research study', *Int. J. of Services Technology and Management*, Vol. 9, No. 2, pp.103–121.
- Barczak, G. (2012) 'The future of NPD/innovation research', *Journal of Product Innovation Management*, Vol. 29, No. 3, pp.355–357.
- Battisti, S. (2009) 'The future of innovation is services based on high technologies', in Von Stamm, B. and Trifilova, A. (Eds.): *The Future of Innovation*, 1st ed., pp.382–383, Gower Publishing Limited, Surrey, England-UK.

- Battisti, S. (2012) 'Service innovation: the challenge for management in hypercompetitive markets', *Int. J. Technology Marketing*, Vol. 7, No. 2, pp.99–118.
- Bijker, W.E. (2010) 'How is technology made? – That is the question!', *Cambridge Journal of Economics*, Vol. 34, No. 1, pp.63–76.
- Carbonell, P., Rodriguez-Escudero, A.I. and Pujari, D. (2009) 'Customer involvement in new service development: an examination of antecedents and outcomes', *Journal of Product Innovation Management*, Vol. 26, No. 5, pp.536–550.
- Chesbrough, H.W. (2003) 'The era of open innovation', *MIT Sloan Management Review*, Vol. 44, No. 3, pp.33–41.
- Chiaroni, D., Chiesa, V. and Frattini, F. (2011) 'The open innovation journey: how firms dynamically implement the emerging innovation management paradigm', *Technovation*, Vol. 31, No. 1, pp.34–43.
- Chiesa, V., Frattini, F. and Manzini, R. (2008) 'Managing and organising technical and scientific service firms: a taxonomy and an empirical study', *Int. J. Services Technology and Management*, Vol. 10, Nos. 2/3/4, pp.211–234.
- Chiesa, V., Manzini, R. and Pizzurno, E. (2004) 'The externalisation of R&D activities and the growing market of product development services', *R&D Management*, Vol. 34, No. 1, pp.65–75.
- Cooper, R.G. (2008) 'Perspective: the stage-gates idea-to-launch process – update, what's new, and NexGen systems', *Journal of Product Innovation Management*, Vol. 25, No. 3, pp.213–232.
- Cooper, R.G., Edget, S.J. and Kleinschmidt, E.J. (2002) 'Optimizing the stage-gate process: what best-practice companies do – I', *Research Technology Management*, Vol. 45, No. 5, pp.21–27.
- D'Aveni, R.A., Dagnino, G.B. and Smith, K.G. (2010) 'The age of temporary advantage', *Strategic Management Journal*, Vol. 31, No. 13, pp.1371–1385.
- Dacin, M.T., Dacin, P.A. and Tracey, P. (2011) 'Social entrepreneurship: a critique and future directions', *Organization Science*, Vol. 22, No. 5, pp.1203–1213.
- Dahlander, L. and Gann, D.M. (2010) 'How open is innovation?', *Research Policy*, Vol. 39, No. 6, pp.699–709.
- Djellal, F. and Gallouj, F. (2008) 'A model for analysing the innovation dynamic in services: the case of 'assembled' services', *Int. J. Services Technology and Management*, Vol. 9, Nos. 3/4, pp.285–304.
- Dolfsma, W. (2004) 'The process of new service development-Issues of formalization and appropriability', *International Journal of Innovation Management*, Vol. 8, No. 3, pp.319–337.
- Edvardsson, B., Kristensson, P., Magnusson, P. and Sundstrom, E. (2012) 'Customer integration within service development – a review of methods and an analysis of insitu and exsitu contributions', *Technovation*, Vol. 32, Nos.7/8, pp.419–429.

- Ettlie, J.E. and Rosenthal, S.R. (2011) 'Services versus manufacturing innovation', *Journal of Product Innovation Management*, Vol. 28, No. 2, pp.285–299.
- Franke, N., von Hippel, E. and Schreier, M. (2006) 'Finding commercially attractive user innovations: a test of lead-user theory', *Journal of Product Innovation Management*, Vol. 23, No. 4, pp.301–315.
- Gassmann, O., Enkel, E. and Chesbrough, H.W. (2010) 'The future of open innovation', *R&D Management*, Vol. 40, No. 3, pp.213–221.
- Goffin, K., Lemke, F. and Koners, U. (2010) *Identifying Hidden Needs: Creating Breakthrough Products*, 1st ed., Palgrave Macmillan Ltd., Basingstoke-UK.
- Goldhar, J. and Berg, D. (2009) 'The convergence of factory and service operations in the 21st century: directions for research and education', *Int. J. Services Technology and Management*, Vol. 11, No. 3, pp.223–228.
- Hall, J., Matos, S., Silvestre, B. and Martin, M. (2011) 'Managing technological and social uncertainties of innovation: the evolution of Brazilian energy and agriculture', *Technological Forecasting & Social Change*, Vol. 78, No. 7, pp.1147–1157.
- Hermelo, F.D. and Vassolo, R. (2010) 'Institutional development and hypercompetition in emerging economies', *Strategic Management Journal*, Vol. 31, No. 13, pp.1457–1473.
- Hertog, P.D. (2000) 'Knowledge-intensive business services as co-producers of innovation', *International Journal of Innovation Management*, Vol. 4, No. 4, pp.491–528.
- Hertog, P.D., Rubalcaba, L. and Segers, J. (2008) 'Is there a rationale for services R&D and innovation policies?', *Int. J. Services Technology and Management*, Vol. 9, Nos. 3/4, pp.334–354.
- Hipp, C. (2008) 'Service peculiarities and the specific role of technology in service innovation management', *Int. J. Services Technology and Management*, Vol. 9, No. 2, pp.154–173.
- Hipp, C. (2010) 'Collaborative innovation in services', in Gallouj, F. and Djellal, F. (Eds.): *The Handbook of Innovation and Services: A Multi-disciplinary Perspective*, 1st ed., pp.318–341, Edward Elgar Publishing Ltd.
- Howells, J. (2010) 'Services and innovation and service innovation: new theoretical directions', in Gallouj, F. and Djellal, F. (Eds.): *The Handbook of Innovation and Services: A Multi-disciplinary Perspective*, 1st ed., pp.68–83, Edward Elgar Publishing Ltd.
- Huizingh, E. (2011) 'Open innovation: State of the art and future perspectives', *Technovation*, Vol. 31, No. 1, pp.2–9.
- Lee, C-S., Chen, Y.G., Ho, J.C. and Hsieh, P-F. (2010) 'An integrated framework for managing knowledge-intensive service innovation', *Int. J. Services Technology and Management*, Vol. 13, Nos. 1/2, pp.20–39.
- Lettice, F. and Parekh, M. (2010) 'The social innovation process: themes, challenges and implications for practice', *Int. J. Technology Management*, Vol. 51, No. 1, pp.139–158.

- Lilien, G., Morrison P.D., Searls, K., Sonnack, M. and von Hippel, E. (2002) 'Performance assessment of the lead user generation process for new product development', *Management Science*, Vol. 48; No. 8, pp.1042–1059.
- MacCormack, A., Verganti, R. and Iansiti, M. (2001) 'Developing products on 'internet time': the anatomy of a flexible development process', *Management Science*, Vol. 47, No. 1, pp.133–150.
- Miles, I. (2000) 'Services innovation: coming of age in the knowledge-based economy', *International Journal of Innovation Management*, Vol. 4, No. 4, pp.371–389.
- Miles, I. (2007) 'Research and development (R&D) beyond manufacturing: the strange case of services R&D', *R&D Management*, Vol. 37, No. 3, pp.249–268.
- Miles, I. (2011) 'From knowledge-intensive services to knowledge-intensive service systems', *Int. J. Services Technology and Management*, Vol. 16, No. 2, pp.141–159.
- Mulgan, G. (2006) 'The process of social innovation. Innovations: technology, governance, globalization', *MIT Press Journals*, Vol. 1, No. 2, pp.145–162.
- Mulgan, G. (2012) 'The theoretical foundations of social innovation', in Nicholls, A. and Murdock, A. (Eds.): *Social Innovation: Blurring Boundaries to Reconfigure Markets*, 1st ed., pp.33–65, Palgrave Macmillan Ltd., Basingstoke-UK.
- Nicholls, A. and Murdock, A. (2012) 'The nature of social innovation', in Nicholls, A. and Murdock, A. (Eds.): *Social Innovation: Blurring Boundaries to Reconfigure Markets*, 1st ed., pp.1–30, Palgrave Macmillan Ltd., Basingstoke-UK.
- Pisano, G. and Verganti, R. (2008) 'Which kind of collaboration is right for you?', *Harvard Business Review*, Vol. 86, No. 12, pp.78–86.
- Pol, E. and Ville, S. (2009) 'Social innovation: Buzz word or enduring term?', *Journal of Socio-Economics*, Vol. 38, No. 6, pp.878–885.
- Raasch, C., Herstatt, C. and Lock, P. (2008) 'The dynamics of users innovation: drivers and impediments of innovation activities', *International Journal of Innovation Management*, Vol. 12, No. 3, pp.377–398.
- Schein, E.H. (2008) 'Clinical inquiry/research', in P. Reason and H. Bradbury (Eds.): *Handbook of Action Research*, 2nd ed., pp.266–279, Sage, London.
- Schleimer, S.C. and Shulman, A.D. (2011) 'A comparison of new services versus new product development: configurations of collaborative intensity as predictors of performance', *Journal of Product Innovation Management*, Vol. 28, No. 4, pp.521–535.
- Skiba, F. and Herstatt, C. (2009) 'Users as sources for radical service innovations: opportunities from collaboration with service lead users', *Int. J. Services Technology and Management*, Vol. 12, No. 3, pp.317–337.
- Sorensen, F., Mattsson, J. and Sundbo, J. (2010) 'Experimental methods in innovation research', *Research Policy*, Vol. 39, No. 3, pp.313–322.

- Sundbo, J. (1997) 'Management of innovation in services', *The Service Industries Journal*, Vol. 17, No. 3, pp.432–455.
- Sundbo, J. (2008) 'Customer-based innovation of knowledge e-services: the importance of after-innovation', *Int. J. Services Technology and Management*, Vol. 9, Nos. 3/4, pp.218–233.
- Sundbo, J. and Gallouj, F. (2000) 'Innovation as a loosely coupled system in services', *Int. J. Services Technology and Management*, Vol. 1, No. 1, pp.15–36.
- Sundbo, J. and Toivonen, M. (2011) *User-Based Innovation in Services*, Edward Elgar Publishing Limited, Cheltenham-UK.
- Tether, B.S. (2003) 'The sources and aims of innovation in services: variety between and within sectors', *Economics of Innovation and New Technology*, Vol. 12, No. 6, pp.481–506.
- van Riel, A.C.R., Semeijn, J., Hammedi, W. and Henseler, J. (2011) 'Technology-based service proposal screening and decision-making effectiveness', *Management Decision*, Vol. 49, No. 5, pp.762–783.
- van Riel, A.C.R. and Lievens, A. (2004) 'New service development in high tech sectors: a decision-making perspective', *International Journal of Service Industry Management*, Vol. 15, No. 1, pp.72–101.
- Verganti, R. (2008) 'Design, meanings, and radical innovation: a metamodel and a research agenda', *Journal of Product Innovation Management*, Vol. 25, No. 5, pp.436–456.
- Verganti, R. (2011) 'Radical design and technology epiphanies: a new focus for research on design management', *Journal of Product Innovation Management*, Vol. 28, No. 3, pp.384–388.
- Verganti, R. and Buganza, T. (2005) 'Design inertia: designing for life-cycle flexibility in internet-based services', *Journal of Product Innovation Management*, Vol. 22, No. 3 pp.223–237.
- von Nordenflycht, A. (2010) 'What is a professional service firm? Toward a theory and taxonomy of knowledge-intensive firms', *Academy of Management Review*, Vol. 35, No. 1, pp.155–174.
- Witkamp, M.J., Raven, R.P.J.M and Royakkers, L.M.M. (2011) 'Strategic niche management of social innovations: the case of social entrepreneurship', *Technology Analysis & Strategic Management*, Vol. 23, No. 6, pp.667–681.
- Yin, R.K. (2009) *Case Study Research: Design and Methods*, 4th ed., *Applied Social Research Methods*, Vol. 5, Sage Publications, Thousand Oaks, CA.
- Zomerdijk, L.G. and Voss, C.A. (2011) 'NSD processes and practices in experiential services', *Journal of Product Innovation Management*, Vol. 28, No. 1, pp.63–80.