

IT for Good. How Technology Adoption and Technological Artefacts can support a Local Community: two case studies

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ABSTRACT

In this paper we discuss how ecology of artefacts and their design are connected with motivations and values within a community. We consider artefacts both as social constructs and as tools and means by which communities can pursue their goals. The complex intertwining of artefacts creates ecologies made of interactions between communities, humans and technologies. Our focus is on grassroots communities oriented towards sustainability-related goals, where we explore how the nexus between motivations and community goals is embodied (or not) by the technologies chosen and domesticated by communities. Thus, motivational aspects are all but immaterial or fortuitous. Indeed, they proved to be tangible, context-dependent and they work as infrastructures whose shape continuously change according to the necessities of the community members.

CCS CONCEPTS

• **Human-centered computing** → **Field studies; Empirical studies in HCI.**

KEYWORDS

Technology adoption, Community Artefact Ecology

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1 INTRODUCTION

In this paper we discuss how ecology of artefacts and their design can lean on participants' motivations to support community members' initiatives. According to Merriam Webster, motivation is “a motivating force, stimulus, or influence : Incentive, Drive”. Here, artefacts ecologies are framed not just as social constructs [10] but as “those bundles of material and cultural properties packaged in some socially recognizable form such as hardware and/or software” [21,

p.6]. The latter view broadens the reflection, including all relevant material or immaterial aspects, avoiding a mere “technocentrism” and implying that the technology adoption niche should be included as well when reflecting about tech artefacts. For this reason, more than looking at theories about motivation, we use qualitative analysis to look at how motivation is inserted in people's discourses, and how it emerges from practices. Our research questions are: how technological artefacts are adopted, shared and continually negotiated to adapt to value-driven goals in small grassroots associations? what is the role of members' motivation in this frame?

Henceforth we approach technological artifacts in line with structuration theory [8] in which social structure becomes invisible because it is embedded in the tech artefact, and the social actor – even by refusing technology – appropriate or domesticate the social structure itself through the hardware tool. Thus design, groupware, and systems of actors and networks are fundamental in determining the social meaning of a technology [20]. As it happens with pen or electricity, some technologies are so part of the social fabric to become almost “seamless”, while others are perceived as more “external” thus they still need to be cognitively processed to be understood, and require a certain dose of attention to be used.

Communities' restless efforts are recently directed towards the resolution of intractable social problems, which became intractable also due to institutional void and political failure at understanding key needs of local population [17]. For example, in recent years there has been a call to repopulate a number of small villages by rethinking the concept of citizenship, especially in terms of a transition of lifestyles toward environmental sustainability [34]. At the same time, students' collective initiatives related to sustainability are numerous and with a high potential, however, they generally do not attract neither policymakers nor Universities' executive bodies in order to be systematised or have a nation-wide impact. The cases reported in this paper are another example of this trend.

The attempts to structure real solutions to this kind of problems, generate what is called social innovation, which is “The reconfiguring of social practices, in response to societal challenges, which seeks to enhance outcomes on societal well-being and necessarily includes the engagement of civil society actors” [23]. What allowed Social innovation – and generally, grassroots innovation – to be more disruptive than in the past, is the access to and the centrality of digital technologies in everyday life besides the possibility to cut the distances by creating communities of interest [14].

The attention to communities, and in particular to grassroots communities, is an emerging topic in the field of Human-Computer Interaction (HCI). For instance, [1], contextualize social networks in the ongoing housing crisis in the USA, concluding that “current

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technologies are not well suited to the particular practices of activist organizations". Instead [13] posit the activities linked to sharing as an ICT mediated action, describing different local and grassroots initiatives in London which merge the need to share tools and services (whether for sustainability or economic reasons) with the necessity to come back to a genuine community life. These works suggest the rising interest of the research in the democratization and accessibility of ICT and in its use for social good. On the other hand, initiatives like fundraising through social networks, crowdfunding, online shared gift experience, grassroots environmental campaigns, collective actions or flash mobs organized through forums, all denote an awareness as well as increasing experimentation in the approach to (digital) technologies. In these initiatives users creatively adopt strategies to converge technologies for social economic and environmental benefits.

Social good is determined by those who are in contact with the key needs of the area and are actively part of the community, which contributes to leading towards a shared vision [28], "in a context of complexity and uncertainty regarding environmental issues at stake, deliberations are mostly about managing interdependencies, i.e., building agreements and implementing changes so as to reconstruct the links between natural, technical and social phenomena" [32]. In this case it is fundamental that the community's vision is compatible with the common understandings and the actions community members want to undertake [32]. Technological (and less technological) tools are the link between vision and action, sometimes performing as a gateway [9]. This ecology of people, spaces and artifacts is initially shaped by community members' motivations, then it is maintained by the community ecology of artifacts and by the constant community members' routinized (and infrastructured) activity.

We investigated two local communities [36]. The first is an engineering students' association active in sustainability and social aid fields. The second one is a village community halfway between a volunteering-based association and a little enterprise exclusively selling local products. Even if they are very different in composition and administration, they share the same interest in local environmental development and sustainability. Both of them work in close contact with local farmers/producers and promote their area whether through sustainable tourism or through various projects based on IT or technology for collective benefit. When looking at the missions and goals of the two associations, any form of capitalization of good and services or platform economy is inadequate to fully frame their activities. The student association is *Ulisse*, *Union Locale d'Ingénierie Sociale, Solidaire et Environnementale* (French for "local union for social, solidary and environmental engineering"), was created in 2019 and has 90 active members (almost 140 participating in online groups). The village association, *Le Cerf à Trois Pattes* (shortened into *Cerf* in the rest of the paper), was created in 2018 after the failure of the local bakery.

We choose these two associations because they are striving for the same goals, related to the promotion of local products, environmental sustainability of food, and care relationships among community members. Despite their values' similarities, they differ for the way they enacted those values. *Cerf* is low tech, rural-based and geographically localized community, while *Ulisse* is high-tech, university-based and project-based community. Comparing two

"complementary" cases allows us to have better insights on the motivations driving tech adoption in community contexts. Moreover, this comparison underlines the links (or the lack of links) between motivations and the accomplishment of goals through technological and human resources.

The central idea of our work is investigating the adoption and domestication of technological artifacts and their role inside grassroots communities where motivation(s) and values play a key role, sometimes leading to contradictory results (eg: claiming to protect privacy but sacrificing it when it comes about attracting new members). In this context we will focus on the role of "motivation" in underpinning community choices. Nevertheless, digital technologies themselves have proven to create a conflict between dyads of values. In the next sections we will discuss how such conflicts did emerge in the communities we studied. We ground the discussion on the concept of community artifact ecology. This concept focuses on the way a community works with and is supported by technology and responds to social (like lack of money, time or managerial capacities) and technical (as low technical skills) challenges or lack of resources.

2 RELATED WORK

While free market encourages innovation through competition, grassroots initiatives emerge as new source of innovation [14]. According to OECD [19], innovation is also connected with the decrease of social inequalities – progressively increasing in OECD's Countries – and is enhanced by ICT. According to OECD, ICT allows to accelerate and democratize innovation, making initiatives less dependent on central authorities and more affordable.

Even if not all grassroots innovations are committed to principles of sustainable development [30], the unique features possessed by these bottom-up initiatives make them prolific from the point of view of sustainability. In addition, most grassroots initiatives are purposefully sustainability oriented [15, 29] whether in social, economic or environmental field [5]. Besides, it has been explored how grassroots innovations may be contributing even to social justice by expanding the possibility to counteract policymaking and understand public discourses and reasoning [2]. According to [7, 10, 15, 22], motivation should be considered in the decision making processes in which stakeholders are involved when it comes about decision related to grassroots initiatives, local communities and sustainability. Motivations in this context are a mean through which communities focus on shared goals [3, 25].

In our work, we investigate the relationship between motivation and technology within communities [36]. To frame this relationship, we refer to the concept of community artifact ecology. A "community artifact ecology" is defined as "the particular constellation of artifacts that a community owns, has access to and uses in its activities. It is characterized by a high degree of shared understanding of the core activities and the role of the artifacts within the ecology" [3]. In [11], Korsgaard et al. expand the definition using the concept of collective: "The collective artifact ecology resulted from the mixture of different personal practices, organizational governance, and regulatory requirements".

The concept of community artifact ecology, then, includes the idea of a common level of knowledge about the artifacts-in-use.

The introduction and appropriation of technology is particularly interesting to study for “low-tech” communities, in particular the way this appropriation could empower a community.

3 CONTEXT AND METHODS

3.1 Context

The village association, Cerf, was created in 2018 to make a 550 souls village survive, and give opportunities to youngsters between two big towns as Reims and Tours. On the one side there was the goal to avoid that young people felt pushed to abandon their place, while on the other, elderly needed to be engaged with public life and re-create a sense of belonging. After several meetings, the most engaged citizens created Cerf, putting together volunteering and regular employment, also obtaining public funding from the town of Reims. We want to understand how the values of the community are used to explain or justify the technological practices of the community itself. To do so, we use the conceptual frameworks of community artifact ecology [3] and of collectives of artefacts [11]. Our methodology for data collection is based on virtual ethnography and participant observation.

The student association Ulisse, results from a fusion of three non-profit organizations in Aube-Champagne region (FR): two are international organizations, while one has been created by University of Technology of Troyes (UTT) students and was focused on sustainability-centered projects abroad and in France, linked to local reality. The aims of all the three associations were centered on human solidarity, (engineering) support in humanitarian initiatives and on environmentalism. In 2018 they decided to become a single association, Ulisse, partnering with AMAP, the collective of French farmers (www.reseau-amar.org).

The village association, Cerf, was created in 2018, after the failure of the local bakery, to make a 550 souls village survive, and to give opportunities to youngsters living between two big towns as Reims and Tours. On the one side there was the goal to avoid that young people felt pushed to abandon their place, while on the other, elderly needed to be engaged with public life and re-create a sense of belonging. After several meetings, the most engaged citizens created Cerf, putting together volunteering and regular employment, also obtaining funding from the town of Reims.

In Table 1, the main characteristics of the two associations are summarized.

3.2 Data collection

Among participant observation methodologies [18], active participation method has been preferred. Active participation consists in involving oneself in the population’s life, becoming effectively a member, participating to their actions and interaction to fully understand their culture. The first author became a member of Ulisse, actively participating in its initiatives. During the pandemic she also started interviewing Cerf members, and after the lockdown she visited Cerf’s headquarter and then joined its activities for one week of participant observation. In field observation some jot notes (the-ins-and-outs-of-field-notes) have been taken and saved on her smartphone while participating to activities: usually notes mostly included factual data reporting date, place, fragments of dialogues,

and actors present. In addition, a reflective diary was filled, after the observation, usually the night itself.

Alongside with several semi-structured interviews, summarized in Table 2, we also pursued virtual ethnography [24] in both groups. Virtual ethnography consists of integrating ethnographic data gathered offline with online data, applying the same analytic methodologies. The assumption is that offline interactions, are key to understand the online dynamics and, at the same time, online activities shape offline behaviours and interactions.

In our research, we analyzed the groups presence in social media (e.g.: posts, “tags” etc.), as well as their conversations. We analyzed Facebook posts (around 10 posts per week for both groups) and Discord messages during six months (approximately 1600 messages). The COVID-19 pandemic made impossible to keep performing active participation, so we continued with virtual ethnography and online interviews. Semi structured interviews has been led, starting from the broader context then narrowing down to the technology adoption, personal values and motivations. We transcribed the interviews and the notes taken during field observations, and conducted a thematic analysis [4], looking at the motivations of the associates, at the use of personal and community artifacts to realize community aims, and at the connection between motivations and the use of artifacts inside the community. From the six months of data collection (interviews, virtual ethnography and active) the thematic analysis highlighted seven themes with three sub themes each. These themes have also been re-elaborated into personas and brief scenarios of use, based on the personas’ motivations.

Three of themes emerged from the thematic analysis are related with the issue of sustainability, interpreted according to the triple bottom line theory [5], which implies considering economic, environmental and social sustainability as mutually influencing although separated. Thus, the first three themes retrieved has been labelled as “social sustainability, mutual support”, “economic sustainability, local economy resilience” and “environmental sustainability, local wildlife protection” The other four themes emerged are less codified and commonly accepted by the literature yet. For this reason, in this paper (see next Section) we focus on these four.

4 FINDINGS

4.1 The right to abandon technology

Both communities perceived a sort of external obligation to accomplish technological standards, combined with an overall suspicious behavior towards technologies. Ulisse, as Engineers’ association, motivate its suspicions with well-argued reasons related to dark design patterns, addictive design of most popular apps, and data privacy concerns and their political implications. Their choice also had clear political connotations, since members did not separate the environmental issue from the political one: not by chance most of them joined Fridays for future movement. An example is a very detailed Discord conversation on joining a group in Paris actively fighting light pollution. Cerf’s suspicious attitude towards technology was instead based on the idea that technology was distracting people from ‘real’ social relationships. Some members feared to penalize sociality while others blamed their incompetence (“I fear to make some disaster, or do something wrong” said Cerf’s shop assistant). Older members –the core of the association– felt not

Table 1: Characteristics of the two associations

Name	Members	Town	Status	Vision	Revenues	General activities
Ulissee	90 active, 137 in group chat. Everyone can join	Troyes	Student association	Engineers for social economical environmental sustainability. Collective and mutual help, environmental projects	Fundraising initiatives, UTT funds, tips	Creation of project related to social & environmental support. Inform educate, promote and organize events.
Cerf	23 decision making, 7 partners among local producers, 553 natives	Saint Germaine	Social enterprise	Collective for local enterprises and tourism. Promotion of territorial resilience	Commerce, tourism (for profit), donation and public funds.	Sell local, organic, sustainable products from small size independent enterprises. Local tourism.

Table 2: List of interviews

Association	Role	Duration	Aim of the interview
Ulissee	Vice president	30 minutes	General data and facts about Ulisse. His aims in the association
Ulissee	Vice president	75 minutes	Use of technology and apps, Ulisse changes after and during COVID 19
Ulissee	Ridesharing creator	30 minutes	General facts about Ulisse and the University, the ride sharing initiative: problems and ideation phase
Ulissee	Vice presidents, Treasurer and three members	45 minutes	Knowing new projects, 2020 plan and getting in touch with members self-introduction
Ulissee	Ulissee Discord members	N.A.	Knowing motivations, and self-perception as an engineer and University member
Ulissee	Ulissee members	30 minutes	Break the ice, opinions about Ulisse and university association
Cerf	President	75 minutes	General information, the association and the artifacts the association uses
Cerf	President	60 minutes	Visiting the venues, getting in touch with the members, understanding vision and mission
Cerf	Member	Several short interviews	Field observation, technology use from elderly associates
Cerf	Activity owner Worker-to-be	40 minutes	Presentation of his activity, work deontology and why joining the Cerf
Cerf	in the Cerf's shop	20 minutes	Motivation to work in a village, expectations and professional background
Cerf	Website creator	40 minutes	Understanding web design, economical and marketing aspects of Cerf

skilled or “young” enough for any kind of technology or social networks even at their basic functions [11].

Another facet of technology abandon was the “non-use”. As noticed in [27], non-use is a form of use and can have different shades, albeit it is sometimes “labeled” or “pathologized”. In Cerf, some forms of non-use happened because of lagging adoption, namely members were waiting for the “right push” to adopt [27]: “I have WhatsApp just to communicate with my daughter in Scotland, and some younger friends help me with computer and smartphone problems” (Cerf president). Some of them might even be discouraged by illness or physical impairment, falling partially in the category of the disenfranchisement [27]. In fact, Cerf’s website creator said that she wanted a website allowing the possibility to have a paper substitution to online purchases. This intention of “do not press the buttons” [27] has been often encountered among Cerf’s members: businesses dealing with technology were usually delegated to other people or to the web design company, although managed by Cerf’s members and customers.

A more complex example of non-use comes from Ulisse since they actively retain or withdraw from some digital technologies, despite their engineering background. Some decided to avoid internet use because of their awareness on mechanisms and functioning of technologies (especially social networks). With their experience and knowledge in ICT and programming, members have the privilege to run the association while remaining coherent with their

ideals most of the time. In this case, skills are the element allowing coherence with Ulisse’s ideals. Some members are also part of the low-tech movement and actively promote non-use. In a Discord message, the vice president declares: “every message you send (...) with your mobile is part of the mass energy consumption impacting sustainability”. In short, Ulisse non-adhesion to technology is a political action and an act of social and environmental responsibility at the same time [27].

Interviewing members and presidents of both associations, we found that members of both communities neither feel represented by the existing social media and tools available on Google, nor by the sharing economy platforms’ philosophy, or generally any existing profit-based platform [31]. This heavily influenced their non-adoption choices, although for different goals: Ulisse aimed to independent technology, Cerf aimed their independence from technology.

Ulissee’s members wanted to disappear as much as possible from the mainstream platforms, so, they collectively shared (among around 20 members) the official Facebook account where they encourage their followers to keep updated with them on other platforms (eg: Discord or Telegram) or on the university radio. Another example for Ulisse is the collective management of the University 3D printer where they produced objects and tools actually useful for them. Online meetings have been hosted on Discord during COVID pandemic but usually meetings had to be held in person both for

privacy and sociality reasons. There is also an assumption of shared knowledge within Ulisse. Any member of the association can freely use all the available tools without warning or instructions.

The Cerf, instead, since members were mostly motivated by “disenfranchisement” reasons and disaffection towards digital technology, tended to outsource and centralise the digital technologies at the same time. For the e-commerce everything is in the hands of the web agency (or, in case of very old fashioned customers they compiled what correspond to online orders through a paper form to fill in the shop). While in the case of social media the shop assistant managed a little bit of everything during the her free time while at the shop. The concept of “ownership” is blurred and context dependent. Cerf’s members do not completely own the e-commerce website and just the design agency has the expertise to create it, however they fully benefit of the e-commerce’s outcomes, whose results empowered the village-community not just under the bare economical point of view, but also by promoting a certain vision and a precise soft power of their countryside life in comparison with the messy and busy life of the closer cities.

4.2 Politics and activism

Associations’ political activism emerges in three ways: participation to public life through tech artifacts technology use as political act, and private digital platform adoption. “Politics” is a latent theme [4], emerging both from interviews and observations.

Ulisse is aware of the politics embedded in the use (or abandon) of software and tech artefacts. Consequently, members actively try to be independent from the so-called big five (Amazon, Google, Netflix, Facebook and Apple), and attempting to come up with technologically creative – even controversial – solutions to solve everyday tasks like managing social media or recruiting members. Perceived injustice and concerns over the future of the Earth, prompted them to question technological common-sense. For this reason, they co-designed their own community artifact ecology. Small changes and updates in the use of digital tools were part of Ulisse’s ordinary life and more complex changes (such as the creation of new apps) were rarer yet present. Besides, some members are intrigued by the perspective of matching their “nerdy” passion with political activism. “I am very good at coding (...) I think you might find my skills interesting” (Discord). After this message a lot of proposal to create “independent programs” followed. This member declared that s/he wanted to join Ulisse not so much for their project related to sustainability but for the “technological” challenge of creating a data transfer system completely independent from Google.

Even the choices that both Cerf and Ulisse’s members made for their everyday life, both for themselves and inside the associations, suggest a very strong and active political consciousness. As reported by a member of Ulisse “I don’t have WhatsApp, actually I don’t even have internet on my mobile.” Also, all Ulisse’s members agree on “...using Discord. First of all, your data is protected there. (...) The problem is that it is not free and not open source.”

In Cerf, perceived injustice or perceived threat for the future is not emerging as a “political” motivation. There is also no concern for what are the unseen (and political [35]) facets of technological tools. Politics, in this case, is a matter of interactions with “who counts” and not a re-assessment of technologies use [33]. Cerf’s

idea of activism through technology is based on the participation to public life through social networks. For Cerf store, Facebook serves not only to sponsor their products and recruit volunteers or workers, but also to express a certain idea of sustainability and land enhancement. Through their constant – albeit very “basic” – presence over social media, and through their Facebook’s page, they spread an idea that is also political. Differently, Ulisse, has a more collectivist and participated idea of technology: everyone in Ulisse’s group can access to Ulisse socials (as long as they abide by its rules), and everyone can propose a project involving a University’s technology like the 3D printer.

In parallel, for both communities “pooling” a platform or a digital artefact (vs private ownership) –or not owning at all– is a political act against capitalism and progressive “de-localization” of food production and consumption. This commonly agreed use of a precise set of public and private artefact, with a participated and basic knowledge of each of them, are the core of the concept of community artifact ecology.

4.3 Change

The notion of “change of paradigm” is extremely popular among the two associations members: not by chance the word “change” and its synonyms was one of the most present in the Discord group. Environmental motivations, with a decisive push towards social benefits and slow tourism for Cerf, and towards environmental activism for Ulisse. All of them are constantly working to see a real change in society. “Change your habits then change the world” (Ulisse’s Discord conversation) is a profoundly felt concept in the two associations and even their artefacts ecology tended to reflect members’ new awareness or knowledge as well as their improvements with technological skills.

Ulisse’s members for example, developed a coivoturage app specialized for UTT students’ as they improved their developing and design capacities. Changed emerged even as a keyword to describe an external, unpredicted element which forced a massive re-negotiation of community artifact ecologies and related goals. COVID-19 pandemic is an emblematic example. With the forced lockdown Cerf’s most tech-resistant members changed their mind about “isolationism” and technology, while the forced stop to their shop pushed them to reinvent a solution in order to sell their products (and indirectly, strengthen local economies devoted to organic food). As a snowball effect, this lead to a series of consequential changes both in the technologies-at-use inside the community and in the management aspects. This is how, for example, the shop assistant and the president had the idea to use Facebook as a selling channel and then to build an e-commerce website. This substantially increased the interest (and the exchanges) in Facebook among the community of elderly people. Since then Cerf literally had a boom and they reached people they would never met with the bare shop and the use of traditional online ads. After the pandemic, they profit of the momentum gained through social network to organise “events” through the Facebook app and to reinforce their identity based on solidarity and face to face communication, instead of weakening it. The last example shows how what matter for the final purpose of the associations is the online-offline entanglement as a continuum instead as “communicating silos.”

The intertwine between online and offline in both cases points to a general consistency across values chosen, albeit there are slight differences between Cerf's and Ulisse's approaches towards their common objective of sustainability. While Ulisse searches coherence by applying behaviors and choosing products conforming to their ideas, Cerf's pursue for coherence implies more an inner research and educative paths, both personal and collective. For example, they organize educational tours for summer tourists, and they are opening a kindergarten. However, entering in Cerf's shop (*épicerie*) the first thing that might be noticed is the almost total absence of plastic: from wrappings, to bags to containers: this is a hint of a more practical level (Ulisse-like) of engagement.

In Ulisse, the common idea of "transition" is related to members' practical efforts to realize a change from "EGOnomy to Economy" (Discord), to shift from an unsustainable world to a sustainable one. In short, they aim to transpose their goals to a social and economical level: "We are trying to move one step forward." For example, during a meeting it has been discussed a project to make a permaculture field in the University's surroundings collaborating with local farmers' association (AMAP). They currently grow vegetables in the University's yard with University's own compost and they created posters reminding students that they can profit of the compost even for themselves.

4.4 Artifact Use

In their contexts, both communities tailored technologies and real spaces as infrastructures by making possible projects and ideas otherwise unrealistic and allowing authentic communication among physically distant people [16], especially during the quarantine months. In this sense, technology functioned as a double infrastructure inside the community ecology of artifact [9]: it infrastructured on the one hand the communication among members, on the other hand the communities' projects themselves. In fact, what actually allowed some projects to exist and scale up, was their "technological and digital" realization. Cerf deployed Facebook and its e-commerce website, and Ulisse opted for a complex entanglement of apps, software and design toolkits.

Internally, Ulisse's members communicate through Discord, even meetings are hosted there. The main strength of Discord is the possibility to create thematic channels. There, they propose projects, meetings, and thematic conversations: each project has a dedicated channel. Every member of Ulisse has access to the Discord group, and sometimes even non-members can join some channels if they have the possibility to contribute somehow to the association.

As we mentioned in Section 3, Ulisse has an Instagram and a Facebook account accessible to all members. Although they would rather avoid social media, they use them to: sponsor their events (debates, lectures, public speeches, fundraising); invite to "presentation meetings" in which they recruit new members; communicate about social engagement, environment and sustainability. Several times per week, members post posters with useful information related to sustainability, agriculture, social inclusion and volunteering. "We dislike using Facebook or WhatsApp to communicate: we do not see ourselves on the same page of their politics (...) But it's impossible so far not to use them, especially because we are small and we want to be reached by everyone" said the organizer of

coivUTT, a car pooling for UTT students and personnel. In addition, every week a different member records a fifteen-minute podcast. The podcast is available as a downloadable file on Facebook and it is on air by the university radio. Besides, since most of Ulisse's members are familiar with coding, they often gather to develop tools for Ulisse's projects. An example was the attempt to create an app for coivUTT, starting by mapping the places where most UTT students used to live, party, and study. However, the project failed due to the pandemic outbreak.

Cerf has a Facebook profile "for visibility, to reach young people and to create events" (Cerf President) and a newsletter sent each two weeks to keep the most affectionate customers informed. Facebook is mainly used to sponsor events and the touristic or educational activities. The final aim, however, is "to meet in person, help each other (...) We want to keep the people united and not to let anyone alone." Special announcements are made for last minute sale and special offers: this proven to be extremely efficient and effective. The page is run by members who have access to the shop's laptop and by the closest associates. Enthusiasts of local products and sustainable tourism very often stumble upon Cerf's website or Facebook page. Paraphrasing what the associates said in their meeting, they do not share page management but they share the involvement, the values and the knowledge (especially related to local economy and environment) among whoever is interested in. The use pattern for Cerf's Facebook page emerged from the data are:

- It was used like a newsletter among association' member. Some members consulted the page just to remember about special offers, events and things they "have to do" for the association;
- Low activity level on Cerf's Facebook page did not correspond to an equal low participation in events and activities taking place offline. The President himself stated that their events ranged from 50 to 120 participants and their touristic events are as well very popular, while very few responded "I participate" in the platform;
- Job offers (mostly seasonal and/or part time) used to be published in the Facebook page instead of using more "appropriate" social networks (like LinkedIn) or newspapers or recruitment agencies.

A Google folder is used for listing the available products; the association's administrators in charge of selling the products are the ones who manage this folder. Customers who see these announcements, online documents, or receive the newsletter and want to buy some products, can put an order by sending an email and paying by transferring money to the bank account of the association. The website was created by a web design agency and is now run by the President and the most motivated and expert associates. The agency followed the directions given by the President and tried to create a website that is easy to run. The website gives the possibility to get in touch with Cerf's staff, ask questions, and know the events hosted by the association (Facebook posts about the events are depicted). But the aim of the website is mostly to sell the products from the little autonomous local enterprises that cooperate with the association.

Broadly speaking, technology was generally considered either an opportunity or a threat to association identity. For the Ulisse, members capacity to easily handle complex software and programming

languages was a matter of collective pride, distinguishing them as a “nerdy” sustainability association. As a consequence, the way they designed and personalized their community artifact ecology conformed consistently with their identity.

Counterintuitively, Cerf considered technology as a threaten to its identity, fearing that it would disrupt one of association’s milestone: solidarity. This determined a generically suspicious attitude and reluctance, especially towards social network. Most of them believed that “yes, technology is useful but...” it’s not worth the trouble.

In this frame, we can include motivation as a part of those “unorthodox”, low-effort strategies used by communities to reach their goals. Goals, in turn, are based on (community) values. This is particularly true when there is at stake something very relevant for the community’s members: in the cases explored, the border between values and motivations is blurred and often they both overlap, giving a complex picture of what satisfies the basic needs of autonomy, competence, and relatedness [26]. Motivation, which is social and spontaneous, becomes part of the strategy, which is planned, through artefacts and a shared and accepted knowledge of them inside an agreed –and negotiated– framework: in short, through a Community Artefact Ecology (CAE), whether formal or informal. CAE emerge out of technology use and not out of (tech) tool features, although the latter in turn may suggest different affordances (or conversely encourage abandonment). Thus, CAE, are community led and bottom up, standing at the opposite pole of a framework, that is predefined and top-down. CAE consequently involves a dialectical and multi-actor process, emerging on the go (design-in-use) and through collective practices (design with vs design for).

5 CONCLUSIONS

Starting with the consciousness that we “need a way of talking about collectives that can consider the objectives, tools, values, and motivations as more than a sum of its activities” [11], we investigated through observational and qualitative methods two communities of interest: Ulisse, an Engineering student association for solidarity and sustainability, and Cerf, a social coop promoting local organic products and slow tourism. The rationale was understanding how technological artefacts are adopted by the community, shared, and continually adapted. We questioned how the goals of the associations are shaped by the dialectic between values and artefacts. We collected data with interviews, virtual ethnography, and most of all participant observation. Our main finding is that meanings of technologies in use (and sometimes not in use) were dialectically constructed or negotiated, as long as this could happen within a system of few, precise values (sustainability, proximity, and solidarity) shared, recognized and understood by the entire community. Technologies were treated (or negotiated) as tools that could change values of the Association. Members recognized the technological artifact neither as neutral nor as socially given, but as the bearing values. An example is the Cerf, whose members at the very start of their activities, generally believed that technology would disrupt the solidarity spirit which distinguish them from the big towns mindset. However, despite this held some truth, they realized that through social media, they were able to “match” with the

youngsters looking exactly for what they were able to offer. Since collectives are mostly determined by collective activities, identity relation and a future positioning [11], the meaning of values, has never been explicitly discussed or negotiated, since they were part of the social fabric of which the same communities were made.

The idea of referentiality [11], was fundamental in both collectives albeit it did not imply excluding members from community nor giving less accessibility according to their abilities. Interestingly, the members of Cerf decided to “outsource” their referentiality, giving the responsibility of the most technologically complex output (the e commerce) to an external stakeholder, and leaving members out of the association to teach how to use some apps from scratch. In Cerf a “most capable person” has not been recognised in the name of its absolute horizontality and since members were very aware of the specific “special tech-ability” of every single member. In Ulisse instead roles emerged according to participation level and to the quantity of time each person was able to devote to the association.

The reason why “value based” motivation encompasses “skill based” motivation to run social media and Association’s account, relies on the identity of the associations themselves. From the interviews and the analysis of group conversations, Identity for them is linked to what motivates their member – in a nutshell, sustainability and local people’s solidarity – instead of what members can do (abilities or job), own or how they think to achieve association’s goals. Which part of the identity is technology dependent and which context dependent and technology comes as a consequence?

Artefacts and pattern of use of technological artefacts are the gateways to recent grassroots innovations, as it has been proved by the two case studies. As we can outline from the findings, on the one hand technology is needed for accomplishing community goals while on the other hand it represents the community values themselves. This confirms the idea that technology is neither neutral nor disembodied from the community itself: it is instead like a “connective” organ (like arteries and veins) of the several organs (long term goals, short term goals, values...) which makes up the whole community body. On the top of that we found that motivation is like the fuel that determines how the community body works. Consequently, a design work should take into account not only the technological or the innovation element by itself. It should be connected with community dynamics and members’ motivations, also welcoming conflictual elements and contradictions (eg: big tech or privacy?) as opportunities to give room for sociotechnical innovation, new scenarios of artefact use and different community organization [32].

Both associations have local empowerment and sustainability-oriented goals, students of Ulisse were highly skilled in informatics and were equally cognizant on sustainability and politics, whereas Cerf members used almost only face-to-face interaction, low technology deployment and negotiation with local politicians. For this reason, even if both associations have almost overlapping values, they deploy very different artifacts ecologies, and different approaches. Ulisse uses less accessible technologies and constantly update their knowledge and their (already high). Knowledge of key characteristics of software, apps and websites is crucial for them. On the other hand, Cerf looks at technology as something

necessary to reach their aims or to keep the contact with other people (somehow a “necessary evil”), preferring delegating what they can delegate and lagging before adopting. Motivations, whether related to members’ values, goals or personal capacities, were what determined the artifact used and how members approached them.

The refusal of the Big 5 from Ulisse, is interesting because, despite Ulisse’s strong motivation of being “independent” they had to accept some tradeoffs to reach their goals. Even if they had potentially the capacity to create acceptable software for almost every need, following such approach they would be unable to reach other UTT student’s and the rest of the citizens. At this point conflicting aims emerged: independence from Big tech and Association’s growth. How is the boundary defined that makes use of some tech legitimate? How are changes and overages negotiated?

As discussed in [32] values are negotiated in a symbolic arena, where the context needed to be redefined among differently motivated stakeholders (in this case, students driven by different motivations). The aim is to share this re-defined meaning of the context among all Ulisse’s members in order to allow values’ negotiation, namely to define the boundary that make legitimate a certain technology adoption or use. In practical terms, the border between values and motivation is often blurred and, sometimes, instrumental motivation to reach desirable goals override values related to sustainability and political activism. Consequently, what shapes artefacts’ use is defined more by motivations, rather than by values. While values shape the purpose (strategy), motivation is an instrument for the purpose (tactics).

Both associations had the common idea that technology should be used just when necessary, and generally, not too much. For Cerf this was due to their fatigue and skepticism when using technologies, while for Ulisse’s engineers, the reason was a mixture of environmental concerns and political awareness. At the same time, both of them really wanted to give priority to ‘in person’ social interactions. These values related to environmental, political and strongly social motivations, led members to a continuous and balanced back and forth of virtual and real life [36].

The use of “alternative” search engines, apps and data storage methods has an extreme political relevance for Ulisse’s members, and they were encouraging others to follow their examples. Cerf instead was not politically active, but their member claimed the right to abandon technology as well. To do so, they adopted two strategies: delegating and optimizing time/effort ratio spent on social networks. For the first case they paid a design agency for their e-commerce, while some of them gave the responsibility to solve technical or “social networks” problems to younger relatives. Keeping informal relationship with all those people capable to use technologies come out to be fundamental for them.

In both contexts tasks, practices and artefact adoption are constantly negotiated, while the subjective experience with an artefact is brought on a collective level in order to build a shared knowledge of the artifact at use [3]. Values and commitment are instead non-negotiable. The two communities reach their own value-based goals through the continuous co-creation of solutions by merging online and offline activities, spaces and objects whose meaning is shared and accepted [25]. Digital objects here assume the meaning of “Things” [12]: sociomaterial situated ensemble that conveys even emotional values.

The understanding of motivational mechanisms and the centralization of human values and experience in HCI, shifted designers’ and researchers’ concerns from technological to social and human factors, questioning “how digital technologies could help shaping positive human functioning, strengths, personal empowerment at the individual level, and of groups and organizations, from a social/interpersonal point of view” [6]. In this paper we discussed the patterns of technology use and adaptation in connection with political awareness, right to abandon technology. The experience of the technology adopted/used are mediated by internal or external factors. For Ulisse, technology is a very well-known topic on which they perceive to have a good expertise and (shared) knowledge (internal factor) and members can benefit of the knowledge and Professors’ advices at University (external factors). In Cerf’s case, technology is perceived as something very difficult to handle albeit extremely useful. As Cerf’s member declares “our e-commerce and our Facebook page are what made us survive during the pandemic, avoiding what happened in 2018 with the bakery”. In both cases, technology-is perceived as a threat to sociality and for this reason they both try to tailor technology use in order not to impact their community and the human and empathy mediated interaction.

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