# Making Service Design in a Digital Business

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**Abstract:** Digital businesses involve multiple stakeholders, each with their own distinct sets of values. In addition to the business value of the global digital ecosystem, a complex web of socio-cultural human values has emerged from digital development. In this research paper, this ecosystem is examined in a Finnish context, through business-led research and development consortia (Nee d for Speed, N4S). The aim of the paper is to present insights into a more socio-culturally sensitive research framework for a digital service development through three experiments using participatory and co-design tools: a stakeholder mapping tool, a value network mapping tool and a design game. The experiments follow the framework of three approaches to making the co-designs (i.e., probes, toolkits and prototyping) presented by Sanders and Stappers (2014). The theoretical framework is pragmatic, developing the process holistically through trial and error or, as a pragmatist would say, through the experience of disruption and crisis. (Kilpinen 2012).

**Keywords**: Service Design, Digital Economy, Participatory Tools, Pragmatism

## 1. Introduction

This research examines the digital ecosystem in a Finnish context through business-led research and development consortia (Need for Speed, N4S). During a two-year period, a service design approach was familiarised with the technologically led discipline and field of business. Starting to construct a common language, revealing and showing the complex interdependencies in digital service ecosystems and finally focusing on one genre in digital service design—the internal marketing and communications efforts of a large software-intensive company—were done to enable the familiarisation. Service design as a mindset and a multidisciplinary methodology has a new perspective to offer for digital ecosystem development, one that is at the intersection of technological systems development and

socio-cultural process management.  In this study, we have chosen a very practical and pragmatic approach to focusing on this kind of multidisciplinary digital service design.

The aim of this research is to present insights into a more socio-culturally sensitive research framework for digital service development, especially in the context of the Finnish software-intensive industry, through three exploratory cases using participatory and co-design tools: a stakeholder mapping tool, a value network mapping tool and a design game played with cards.  The experiments follow the frameworks of three approaches to making co-designs (i.e. probes, toolkits and prototyping), as presented by Sanders and Stappers (2014), resulting in a supportive proposition.  The probes (value network mapping) are designed *for* users' purposes in mind, the toolkits (stakeholder mapping) are designed *with* users' purposes in mind and the prototyping approach is adequate for both purposes (Sanders & Stappers, 2014).

The focus is neither to offer new methods into the service design methodology nor to highlight any particular method over another on the basis of their in-built socio-cultural sensitivity.  Instead, the aim is to emphasise and fortify the social basis of existing design methods through the notions presented in pragmatist philosophy.  The three experiments presented in this paper serve as descriptions of how community-led communicative action results in shared knowledge, a sensemaking truth approved by the participants of the situated practice (Jensen, 1991).

In the context of the Finnish software-intensive industry, customer insight is still heavily based on technical value propositions, such as the new product features offered to the customer.  The service design approach, which aims to achieve end-user understanding, including a common ground of experience that the customer (the utterer) and the manufacturer (the interpreter) share, i.e. situational and contextual *commonage* according to Nöth (2011, p.180), is basically the same within any organisation where co-workers and colleagues are looking for collateral experiences to strengthen their communication.

The aim and focus of the N4S research consortia is to create shared knowledge (eco)systems instead of developing further the specialised silos of knowledge.  The challenge is in the definition of knowledge, which, in our suggestion, is all about communication, communities and a common ground.  A general definition of knowledge is quite static, hierarchical and related to the conception of truth. In relation to knowledge, this conception often refers to a one-way transfer of valid information, which thus neglects the discursive nature of such knowledge.  A social pragmatist perspective of the concept of knowledge refers to an ongoing process of action that is essentially active meaning making in everyday situations (Kilpinen 2012).

A more comprehensive solution to the problem of the silo mentality within organisations starts from acknowledging the current practices in the separation of two types of knowledge: a) the technical comprehension of knowledge as expertise and typically accumulated in silos, and 2) common ground knowledge collectively experienced and shared.  In fact, knowledge as human ideas and cognitive competencies is largely social

inasmuch as experiences are felt to be collective (Bergman 2006).  When the focus is on building structures and systems supporting also the discursive practices of knowledge creation, an organisation is more capable of becoming more transparent to its own staff and other stakeholders.

Service design tools, especially rough prototyping and mock-ups, serve as effective signs in "establishing a *commonage* of signification" (Nöth 2011, p.178).  Prototyping, for example, is an approach that enables designers to focus intensively and holistically on touch points, on moments of the use of material and artefacts during the service design process, according to Sanders and Stappers (2014) and on the "alteration of habits", according to the pragmatist approach (Kilpinen 2012, p.62).  In this sense the service design process is a constant procedure of change and meaning making and developed holistically through trial and error.

## 2. Methodology

The methodological and ontological perspective follows a service design definition taken from the pragmatist perspective of this paper.  As a practical social process, service design calls for constantly reconstructing itself in a qualitative way.  The empirical data gathered for service design research purposes is quite similar to case study research, action research and the principles of data triangulation, which all are sensitive to social and cultural representations of the on-going process.  The new "things" and "changes" acquired during the cases were constantly changing the service design process itself: new challenges emerged, whereas the old ones were declared irrelevant for the development process, thus the new knowledge was acquired.  This research approach has the ability to focus on actual practices on the spot; is reliable through the systematic transcription of data; is context-based; uses methods that reveal insights that are not quantifiable; actively involves researchers; constructs aims that are negotiated with the entire group; and creates context-dependent insights as an outcome. (Yin 2014; Denzin & Lincoln, 2003; Silverman, 1998; Greenwood & Levin, 2003)

In this paper, the participatory design tools and methods are applied inside a research consortia, as well as for developing more fluent internal communication channels inside larger companies.  Participatory innovation gathers theories and methods from across different academic fields to describe and construct models of how people outside an organisation can contribute to its innovation (Buur, Ankenbrand, & Mitchell, 2013; Koskinen, Zimmerman, Binder, Redström, & Wensveen, 2011).

In addition to qualitative design research methodology, this research paper leans toward Peircean pragmatism, as illustrated by Kilpinen (2012).  According to pragmatist process ontology, human activities during the service design process, such as end-user orientation and involvement, collaborative workshops and co-prototyping, serve not only as empirical data-gathering procedures from the classical research point of view, but also rise to the challenge of the limits of knowledge.  Kilpinen (2012, p.47) defines social action as follows:

> "Action is to be taken as a process but not as a linear process, rather as one with a cyclical structure. This is because action is supposed to meet unforeseeable problems and hindrances that can stall its course. These problems, however, can usually be solved insofar as the acting subject makes use of her or his reflective resources."

The excerpt defines action in a way very similar to how action is used to treat and reflect design research, including the service design approach (Archer, 1995; Miettinen, 2009b). The recent effect that service design has had on the design research tradition is, for example, in bridging design to anthropology (Otto & Smith, 2013). Service design applies qualitative research approaches, such as anthropology, ethnography and social science methods (Sanders & Stappers, 2014). In addition, service design is implemented very often in instances of case study research, intervening action research, and in participatory action research – all descendants of the "[G]ood old Participatory Design," as Bjögvinsson, Ehn, and Hillgren (2012) have stated. Both design and anthropology refer to "a process character of human action" (Kilpinen, 2012, p.45).

In this research paper, the service design dimension is brought forth by bridging design research to social pragmatism. It has similar aims to anthropology, which is to involve everyday human activities in the design process, but in a way that emphasises the social aspects of the process character of action. This notion to action as a social process contributes to the prevalent perceptions of design thinking as an individual and inner process of a designer (Cross, 2006), but at the same time it pilots the theory of design thinking towards the fields of user-centred design, participatory design, co-design, service design and social design (Miettinen & Valtonen, 2012; Sanders & Stappers, 2014; Sangiorgi & Prendiville, 2014).

## 3. Making in Digital Services

The research frame in this paper is part of a larger ensemble of service design, development and research projects designed and implemented at the University of Lapland, Faculty of Art and Design since 2009. The programmatic nature of this research is constructive (Koskinen et al, 2011), and the research has progressed piece-by-piece, becoming a culturally sensitive approach to service design. The service design team at the University of Lapland has systematically collected qualitative research data from projects utilising a SINCO (Service Innovation Corner) laboratory, where service design has been strongly integrated into business development through observations, videotapes, questionnaires, and other documents (e.g., meeting notes, invitations and workshop outcomes), and always in collaboration with the real companies (Rontti, Miettinen, Kuure & Lindström, 2012). Since the beginning of this programmatic research ensemble, which began in 2009, the general research frame has mainly followed a qualitative design approach, including multiple case studies and iterative action research (Yin, 2014; Greenwood & Levin, 2003). Company case studies aim at service design concepts, and are carried out through service prototyping and other participatory and collaborative workshops with the company representatives involved.

The results of previous research projects also served as the basis for the research implemented in the N4S consortia presented in this paper.

Recent research interest at the University of Lapland is directed towards digital service design research and development, together with the major software intensive companies in Finland.  The built-in aim has been the development of digital service design tools and methods as an iterative process in a four-year time frame in the N4S research programme, starting with problem-based and end-user-oriented service design briefs (2014) forging ahead with in-depth service design thinking among partner companies (through 2017). Throughout the program, service design tools and methods will be developed for the digital economy, and the partner companies are directed toward an in-depth understanding of customer-oriented, explorative and real-time value creation on a case-by-case basis (Miettinen, Rytilahti, Vuontisjärvi, Kuure & Rontti, 2014).

## 3.1 Probes in Mapping the Value-Network of Digital Ecosystem

A metaphoric example of the best work practices used in the software-intensive digital industry is to copy commando procedures: Successful companies parachute their design teams into the emptiness, leaving them to survive in completely new business and design contexts.  To survive, the commandos have a set of basic tools to use in their new environment. In this paper, these tools are service design and design tools such as prototyping, probes and stakeholder mapping (Stickdorn & Schneider, 2011).  These tools are used to support interaction and communication between people such as humanists, scientists, engineers, business people and ordinary end-users who do not share experts' terminology and language.  But what are those tools, and how is the toolbox assembled for the expedition to an extended digital ecosystem?

In Finland, the digital technology, software engineering and expertise are excellent, but the assimilation of a more user-centred approach to developing digital products and services is comparatively slight.  The development processes are technology-led, and the relevance of the end-user and research has developed from decades of empirical research conducted on information systems (IS), human-computer interaction (HCI) and design research.  The common aim of these design science fields has been to use the latest technological solutions to design, redesign and improve an organisation's functioning (Kuutti, 2007). In the early 21st century, this is still a problem, and large companies and corporations have started to look for added value from human-centred design and service design perspectives.  Service design methods offer ways of analysing end-users' and customers' motivations and emotions and tools for constructing internal organisational processes in collaboration.  A main finding is that service design serves as a platform on which the company's values, customers' needs and motivating emotions meet (Miettinen & Valtonen, 2012; Stickdorn & Schneider, 2011; Stickdorn & Schneider, 2011).  This visualized mapping is based on studying end-users' and customers' values and value networks (Heinemann, Mitchell, & Buur, 2009).

A participatory design tool, a silver set, a collection of silver-coloured bric-a-brac, developed by Heinemann, Landgrebe and Mitchell (according to Heinemann, Mitchell, & Buur, 2009),

was tested as a tangible and collective mapping tool among the N4S consortia partners (Figure 1). The workshop and the new tools experiment had three aims. The first was to get to know each other in smaller groups, since about 150 people participate in the trimonthly consortia meetings. The second aim was to familiarise company representatives with an actual end-user of their products and services. In this workshop, the real end-user was an 80-year-old woman, "Granny", who was presented to the group by replaying an edited video profile of her. In the video profile, she talked about her everyday life, personal contacts, values and challenges. The third aim, and the final result of the workshop, was a visual and tangible network of values from the end-user's point of view, a perspective not very familiar to the company partners of the consortia.



*Figure 1   Tangible value network mapping with the 'silver set' tool. Research and company partners of the Need for Speed (N4S) research programme think out loud about how digital services are experienced by the potential end-user.*

The "silver set" experiment was used so the people invited to the workshop could come up with the need to build something especially for the use of the whole consortia, a tool to which everyone can contribute and a tool for constructing a common language for the collaboration.

> "Who is that 'Granny'?" asks the moderator of the workshop after replaying the video profile. She continues, "She is a real person."

> The three groups start discussing "Granny." They stand still, their hands in their pockets or with their hands on their hips.

> "What are her values in her everyday life? Who are her family members, friends and who belongs to her circle of acquaintances?" asks the moderator. After a while, she

asks the groups to move on to fiddling with the pieces of silver bric-a-brac on the table in order to get familiar with the objects:

"What are the bits of silver bric-a-brac like? What are the features of those things? What do they feel like?" she asks.

The group members end up picking one or two items from the table. They start to describe the features of those things. Everyone has something to say about the piece she or he has chosen. People start to "think with their hands," as one of the participants stated. [Excerpt from a video analysis]

After participants began "thinking with their hands", the groups discussed the values that the end-user, "Granny", appreciates.  With or without the silver pieces, the participants shared their ideas about her values and value networks.

The next phase called for thinking about these values from the value proposition, or from the business point of view: How can your company, whose business is in software-intensive digital technology, serve Granny and help her sustain her value network?

The first notion of this kind of tangible mapping of values was how the values that Granny mentioned were not the values she was granted.  There were many reasons for this: The value offerings by the companies did not match older people's values; or the values that Granny appreciated are dissimilar to the values of the other stakeholders involved in the value network (i.e., family, relatives or service workers at the retirement facility).  As a result, the participants emphasised a service broker whose assignment was to create a digital service offering that Granny and others involved in her value network would value.

In the final discussion, three value network maps, in which the core value propositions for the digital business were freedom, security and support, were presented.  For example, the silver and metal bric-a-brac were taken as more serious and professional tools for use than items made of Plasticine, paper tubes, wooden building blocks or disposable paper and plastic ware (Buur et al, 2013).  The participants felt it was easier to collaborate with people from different fields of expertise.  An example of the most frequently used "blocks" or things were the chains used to illustrate the connections between different factors and values and the distances between them.  In general, the notions concerning the task and tools were positive, and the three final presentations of value networks provided a general view at the latest shared comprehension of the real user-value.

## 3.2 Toolkits in Designing with the Stakeholders

The reputation of a solid, secure Finnish software technology expertise is being challenged by global stakeholders proposing open-source and open-data approaches.  The preliminary data collected and analysed for the service design cases through teleconferences, focus group workshops, stakeholder maps and participatory design methods have yielded a more defined research framework.  The structure of the research frame from the on-going company cases is relevant, since the approach for a longitudinal, iterative case study on the Finnish digital ecosystem requires a multidimensional perspective from the business point of view.  This multidimensional perspective reaches all the way to the end-users of the digital

products and services.  The research framework also caters to socio-cultural perspectives related to Finnish digital business development as a central focus of service design research.

The focus group method is a tool for organising a group discussion under a predefined issue or theme. In the cases presented in this paper, the focus is defined through the actual company cases, the design briefs from the service design and the research point of view. One general advantage of these small-scale and company-specific case studies is the opportunity to interact and communicate with each other in consensus, and to construct a common language between the consortia partners from various fields of expertise.

The first stage result of a company case is a stakeholder map constructed by analysing the data collected in the focus groups (Figure 2).  The internal processes of the company and the company's relationships with external stakeholders was made visible through this visualisation.



*Figure 2   A stakeholder map visualised based on a focus group analysis (H.-R. Vuontisjärvi).*

"One really smart visual form can change everything," noted a focus group member, when he saw the first layout of a simplified stakeholder map of the organisation.  Specifically, large corporations in the software-intensive industry are fulfilling and communicating their systematic and efficient work methods by making technical and other details more visible, instead of decreasing the details and simplifying the ones left visible.  A simplified visualisation or a map of a company's stakeholders represents an efficient tool for increasing the transparency of the organisational processes inside the company and outside for business customers and other stakeholders.

Service design tools are used for design thinking (Miettinen, 2009a; Miettinen & Valtonen, 2012; Sangiorgi, 2012).  These tools support designers' methods of thinking or design knowledge as a research locus originating from three sources: people, processes and products (Cross, 2006).  In addition, the designers' methods of knowing, or the mode of designers' thinking, is solution-focused problem solving, since the designers' main tasks are solving and tackling "ill-defined" problems.  In addition, a key skill in design thinking is the

ability to use 'codes' that translate abstract requirements into concrete objects. This requires metaphorical, iconic, indicative, and symbolic skills of reading and writing, (i.e., visualising in "object languages") (Cross, 2006).

## 3.3 Prototyping Internal Communication

During the summer 2015, a service design experiment aimed at experience prototyping was launched together with a large software intensive company as part of the N4S consortia. The goals for the collaboration were organisation and business oriented: to facilitate and implement a service design case to firm up the image of the knowhow, processes and business potential situated in teams inside the corporation. One team (made up of approximately 13 people) inside the company enrolled as a focus group for this agile service design case after the first kick-off meeting. The service design team of the University of Lapland constructed a service design brief, and the agile case, in collaboration with the focus team, started. From the research perspective, the aim was to collect data on the lean and agile development processes in digital business, especially from the service design point of view.

Coughlan, Fulton Suri and Canales (2007, p.133) are convinced of the value of prototyping as an organisational development and change method: "Not only does prototyping change the conversation, it changes behavior", they say. In prototyping, the time and energy otherwise spent discussing and planning future visions verbally with abstract meanings is now employed in creative, collaborative and constructive activities. Prototypes give people permission to act differently (Coughlan et al, 2007). According to Bruce and Wyman (1998, 169), the role of the prototype is to be "an actual implementation of the critical parts of change", and this also seems to apply to changing organisations by design (Coughlan et al, 2007).

In summary, the main results of the agile case are applicable to business, organisation and service development, since the service design prototype was actually a concept developed the furthest ever by the service design team at the University of Lapland. In addition, the prerequisites for a successful case were the commitment to the case by the focus team. This was a 'thank you' to the prototyping approach, which gave the participants a comfortable feeling when participating to the case. The knowledge the company's team possessed was enough for participation, and there was no need for a "prolonged analysis of existing or historical practices" or managing the company's strategy or other definitions of policy (Coughlan et al, 2007, p.132). Also, the face-to-face collaboration during the multiday workshops in the team's open-plan office was a factor that supported the faster progress of the service design case.

A straight result after the first multiday workshop with the focus team was a map or visualisation (i.e., blueprint of the communication channels and procedures used by the company team in relation to their customers inside and outside the company) (Figure 3). The blueprint was the first act ever accomplished inside the team as it tried to build an internal communication progress into a concrete format of any kind.

*Figure 3   First blueprint constructed in collaboration with the focus team.*

Five other prototypes for internal communication were produced during the same service design case: a service catalogue, a card game, a service tool proto, a service guideline and a marketing campaign.  A common benefit of all the prototypes constructed was quite basic and necessary in every communication, yet still clearly less obvious inside the company: The knowledge possessed by the team and the objectives of the work performed by the team was now transparent and easily available to the other teams and units inside the company.

The card game was an interesting, easy and motivating prototype from the company's point of view (Figure 4), though designing its content and rules was not an easy task to pack up, and it demanded three iteration cycles of testing and development in collaboration with the focus team.  The first sprint of the game prototype was designed to be as real as possible, aiming to reproduce communication procedures and customership actions.  During the subsequent iterations, the game was simplified piece-by-piece by using the tangible elements to guide the proceeding of the play as much as possible.  The card game was designed to improve internal communications and to demonstrate internal services. In addition to the aim of introducing the actions and services offered by the team for the internal customers of the company, the other aspect was to present more clearly how services are delivered.

*Figure 4   A prototype of a card game for the company's internal communication.*

As opposite to a common conceptualisation of the neatly engineered service systems, this paper presents a slightly "messier view of services" (Sangiorgi & Prendiville, 2014, p.69).  The card game is a prototype constructed by the service design mindset, illustrating that service design ought to be viewed even "less designed and more assembled from fragments of practices, institutions, life-styles and networks" than before, a kind of a conceptualisation of services that is consistent with the anthropological perspective of services as part of the human historical and localised conditions, or organisationally historical conditions, in this case (Blomberg & Darrah, 2014; Sangiorgi & Prendiville, 2014).

The results of this experimental case are parallel with the view of Coughlan, Fulton Suri and Canales (2007), suggesting that prototyping is a powerful means to "facilitate organizational development and change".  Especially, the value of prototyping as an action of "building to think" seemed to start to contribute not just to the process development of the team, but also to the more general thinking from the organisation's point of view (Coughlan, Fulton Suri & Canales, 2007).  Also, as a focal result of this case, we noticed the growth in motivation and commitment when being able to participate in a process whose progression is made so visible and tangible.  This is the pragmatist perspective to social innovation.  Social relations in a team, unit or more generally at the organisational level still emerge through social action, not just through social being (Kilpinen, 2012, 63; Kurvinen, 2007).

## 4. Conclusion

Service design for and with Finnish digital businesses starts with the construction – or designing – of a common understanding of the digital phenomena, including equally the technological, economic and socio-cultural perspectives to digital development.  At the moment, the digital business is developed the technologically led, forging close ties between technology and systems development whereas collaborative, motivational and creative small-scale processes inside companies are not very well plugged into the corporate level management.  The inconsistency in the scalability between the large-scale and the small-scale processes and innovations lies in the direction of the processes (from technology to service orientation), as with the character of the innovations developed, or undeveloped, the main emphasis is still on technical innovations at the expense of social innovation.

The methodology used in this research is coming from the service design, design anthropology and constructive design research, with an ontological twist toward pragmatism.  The exploratory cases have constructive aims, and as a type of an action research approach these aims are enacted through company-specific case studies.  Therefore, we have chosen a very practical and pragmatic approach. Three exploratory case studies are presented, aiming to evoke a discussion and to create a more common understanding of the digital business ecosystem in Finland.  As a preliminary result, a preliminary framework for more user-oriented Finnish digital business research and development, in which the discussion of the values offered to business development through participatory design tools, is presented.

According to the pragmatist perspective of the process character and design-based approach to organisational change, we propose that large technology and software intensive companies take action inside their organisations, and especially in the field of down-top social innovation.  This does not mean they should make a move towards technology, but rather that they should make a move towards internal (and external) logics and tools of social actions.  Maybe the teleconferences, intranets or e-mails are just part of a larger system of social interaction still undermanaged in the large companies.

The question of further research is what we have learned about the logics of processes in a small-scale (i.e. at the team and community level), and how these findings are applicable to large scale (i.e. at the corporate level).  How can service design help various types of processes and their realisers to keep pace with the development (i.e. to give tools to notice and address the possibility "for new grooves" in existing processes)?  However, to give a reminder of the pragmatist perspective to process character of action, the question is also how service design is able to give tools and mindsets to treat the process as an integral whole, not only as separate actions or problems to be solved.  Digital service design is taking place at the intersection of technologically led development and customer-focused service thinking (Vargo & Lusch, 2008).  When the software systems' designs and the human-centred orientation of service design have proper instruments to merge the technical and social features into a common and a transparent whole, though a much more simplified

conception of a serviceable process, the results are to be inevitably supportive of new digital economic growth.  This is also what 'agile' and 'lean' could mean in a social pragmatist sense: there are also 'little', incremental moves in a joint process of material (technical) and social actions.

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