

Realizing Design Thinking through a Service Design Process and an Innovative Prototyping Laboratory – Introducing Service Innovation Corner (SINCO)

Satu MIETTINEN^a, Simo RONTTI^a, Essi KUURE^a and Antti LINDSTRÖM^a

^a*University of Lapland*

Although service design has been widely recognized as a holistic approach, the methods of service prototyping tend to focus on specific parts of services instead of the entire service experience. The SINCO (Service Innovation Corner) project, started at the University of Lapland in 2009, recognized this problem and began to develop an environment for holistic service prototyping where building a prototype in a “rough and ready” manner, but utilizing quick and agile methods, would be easy and collaborative.

In this paper we outline the benefits of the service design process, especially from the service prototyping point of view. We also introduce the SINCO prototyping laboratory concept, and present the related service prototyping elements, methods and tools. During the development of SINCO, several cases were performed for clients and in this paper we present three of them in order to uncover how service prototyping methods and the SINCO laboratory were used in different phases of the service design process and how this also facilitated design thinking.

Keywords : *Service design; Service prototyping; Design thinking; Prototyping laboratory*

1. Introduction

Service design is a new field of design investigation where the vocabulary and paradigm are still developing. First, the paper looks at the connection between service design process and design thinking and then it discusses possibilities of prototyping in service design. The main focus of the paper is in representing the elements and methods of SINCO service prototyping laboratory and how these can benefit service development in different business cases. In our opinion service design process and our laboratory concept together provide a tool for realizing design thinking especially in multi-disciplinary teams. Conclusion offers brief insights and lessons learnt.

Research data was collected during the SINCO (Service Innovation Corner) project, whose main goal was to build a prototyping lab for service and interaction design at the University of Lapland. SINCO is a laboratory concept consisting of an environment and a set of tools dedicated to service prototyping. In this paper we look at three business cases through which we studied service prototyping methods, the usage of the SINCO laboratory and the role of the service design process in development in action.

2. The Service Design Process as a Design Thinking Tool

Service design is establishing itself as a method for developing services and service businesses (Miettinen, 2011). Service design process has characteristics from both iterative design process goals (Gould & Lewis, 1985) and Human Centered Design (ISO 9241-210, 2010). In service design there is an iterative cycle of design, test and measure, and redesign. The Human Centered Design process model can be applied to involve problem framing, information gathering and interpretation, solution ideation, development and evaluation in developing an existing service or in designing a new service solution. Human-centered design thinking captures unexpected insights and produces innovative solutions that more precisely reflect what consumers want (Brown, 2008).

Service design connects the areas of cultural, social and human interaction. The use of different design methods, design research, design thinking and various visualization techniques link different stakeholders' views during the service design process. Van Oosterom (2009) proposes a five-phase service design process that consists of discovering; conceptualizing; designing; building; and implementing. This is similar to both Engine's (2009) three phases: identify; build; and measure and Mager's (2009) four-phase process: discovery; creation; reality check; and implementation. Service design process is starting to find its form and a variety of different process models can be found in the service design literature and on companies' websites (Mager, 2009; Van Oosterom, 2009; Moritz, 2005).

The different process models vary according to the number of steps or the accuracy and the aspect identified in the phases. The identification and discovery phase is about understanding the service context and the users, as well as the business environment of the client. The building, conceptualizing and creation phase is about visualizing, co-creation, participatory design and prototyping. The main aim in comparing service concepts is to find out what the profitability of the service would be and if the created services would be valuable to customers. The implementation phase, incorporating the IT process, development and training, is also often included in the process (Mager, 2009; Van Oosterom, 2009).

Design thinking, as an integral part of service design, has an ability to create concepts, solutions and future service experiences that are usable and desirable for users and efficient and distinctive for service providers. Designers work as coordinators between all

the stakeholders in service development projects. According to Brown (2008), thinking like a designer can transform the way services, processes or even strategies are developed in companies. The characteristics of a good design thinker are: empathy, integrative thinking, optimism, experimentalism and collaboration.

User involvement in the design process is essential. The users' role may vary from proactive participation, where users contribute to solving and framing design challenges, to an inactive role where designers interpret user data without direct engagement with the user community (Keinonen, 2009). When the customer and the end-user participate in the design process, new ideas, service needs and different ways of utilizing technology are encountered. Service design process and methods can help in innovating customer-orientated service concepts (Miettinen, 2011).

The service design process uses generative, formative and predictive methods (Fulton Suri, 2008). It has the implicit idea of innovation and it can use several methods for concretizing new offerings or innovations even in the same development process. Design thinking uses the designer's sensibility and methods to match people's needs with what is technologically feasible and what a viable business strategy can convert into customer value and market opportunity (Brown, 2008). Designers' tools and the service design process emphasize empathy for the users, creativity, visual thinking and co-design.

Lockwood (2010) defines design thinking as a human-centered innovation process that emphasizes observation, collaboration, fast learning, visualization of ideas, rapid concept prototyping, and concurrent business analysis, which ultimately influences innovation and business strategy. Design thinking also involves consumers, designers, and business people in an integrative process, which can be applied to products, services, or even business designs. Service design definitely offers a tool to design thinking and further service prototyping can benefit both concepts and business strategy development.

Furthermore, Lockwood (2010) emphasizes the role of visualization and hands-on experimentation, and creating quick prototypes, which are made simple enough to get usable feedback as an integral part of design thinking. Prototyping can provide a way for a dialogue to take place. These same elements are the core of the service design process. Service prototyping has the same focus as the purpose of prototypes in the design thinking process: "to make intangible become tangible", using various ways of visualization: concept sketches, rough physical prototypes, stories, role playing, storyboards or any form of visualization.

Services, just as interactions, are ongoing processes and activities where the user is part of creating value. Service design and interaction design benefit from each other; digital interaction design has utilized and adapted ethnographic methods and some of the theoretical frameworks used in interaction design, such as Activity Theory, can support the design of services (Holmlid, 2009).

Interaction design focuses on user-centered design and in service design human-centered design is in focus (Holmlid & Evenson, 2007). In service design, instead of focusing merely on customers, it is important to come together with different stakeholders and co-create value with them. These kinds of processes are clearly linked to cooperative design and participatory design literature (Holmlid, 2009).

3. Prototyping as an Approach to Designing a Service

Service design, as a multi-disciplinary field, has adopted working traditions from several fields. A variety of methods and tools derive from ethnographic research, marketing, industrial design, business and management (Tassi, 2009). In the service design

process, prototyping most clearly represents an activity stemming from (industrial) design. However, the immaterial nature of services, for example their simultaneous production and consumption and heterogeneous production quality, has called for new ways to concretize and illustrate new service concepts (Winhall, 2011). At the same time, many innovating practices and working principles (such as “the Ideo way”) emphasize approaches such as “quick and dirty” prototyping, “failing often and early”, “thinking with hands” and “serious play” (Kelley & Littman, 2001; Brown, 2008). Moreover, the reality of new service development in companies – the competitive situation of the business, time-to-market demands, the unpredictability of customer needs and the business future - set continuous challenges in terms of the speed and agility of the design process.

Our research and development work on service prototyping falls into two different areas: the first area considers how service prototyping can add value at various stages in the service design process to elicit customer insight and help communicate and evaluate new service concepts; the second area focuses on the development of agile technologies used to prototype servicescapes, touchpoints, service moments and paths quickly and iteratively. The use of design methods and agile technological solutions enables the rapid creation of different service environments and interfaces digitally. Experience mock-ups can be tested, saved and developed further during the concept design phase. Technologies also help create contexts for understanding radical innovation opportunities.

The use of agile technologies also builds a bridge between interaction design and service design. Interaction design encounters service design in business innovation, e-government, and a whole range of other settings. There is a range of service settings in which interactive artifacts are used to perform services, and a set of business innovation strategies combining process innovation and interactive technology. In the meeting between these the service perspective becomes a challenge to interaction design, and technology usage becomes a challenge to service design. Interaction design focuses on the design of the interactive artifact, while service design focus on the design of the service that the interactive artifact is a part of (Holmlid, 2007).

Just as it is in other design practices, prototyping is one of the core methods in service design. The main purpose of prototyping is to concretize an idea (Fulton Suri, 2008). Prototypes should represent product, technological and social interactions (Kurvinen, 2007). They can quickly and cost-effectively communicate a service proposition and prompt questions on the technical feasibility, consumer desirability, and business viability (Samaliois, 2009).

The goal of a prototype is not to complete the design. It is to learn about the strengths and weaknesses of the idea and to identify new directions. (Brown, 2008) Service designers find service prototyping central to their work because it is collaborative, makes services visible and helps to communicate service concept suggestions (Blomkvist, 2011). Prototyping enables collaborative work with stakeholders when designing product service systems and multi-channel services. Stakeholders’ participation helps to figure out ways of realizing ideas already at the concept design phase.

The aspects discussed above, together with the nature of the service designer’s role as a coordinator between all the stakeholders, have lead developing the holistic service prototyping laboratory concept and a hands-on working culture. The SINCO prototyping laboratory introduced in the next chapter works in the areas of interaction design and service design and increases the understanding of how they interact and contribute to service development.

4. Service Innovation Corner (SINCO) - a Prototyping Laboratory Concept

SINCO is a laboratory concept consisting of an environment and set of tools suitable for service prototyping and interaction design; it is a facility for service design practice. As an environment, the laboratory could be classified as a mixture of a showroom, theater, craft workshop and a modern meeting room. Culturally, it is a place where you are “allowed” and enabled to do whatever is needed to concretize and test experiences. Whereas traditional mockup workshops used, for example, in industrial design focus on building individual tangible artifacts, SINCO offers tools for concretizing holistic user experiences and scenarios. This is analogous to the design thinking principle: “try thinking verbs not nouns” (Kelley & Littman, 2001).

In SINCO service prototypes can be quickly built, evaluated and developed. Being strongly based on digital prototyping material, such as photos, videos and recorded sounds, the prototypes are quick and easy to develop and vary. This is ideal for hands-on service development, where new ideas are generated while testing existing prototypes, and also supports the co-creational culture of service design, where anyone can build on the ideas of others. The main parts of the SINCO prototyping environment are presented in figure 1.

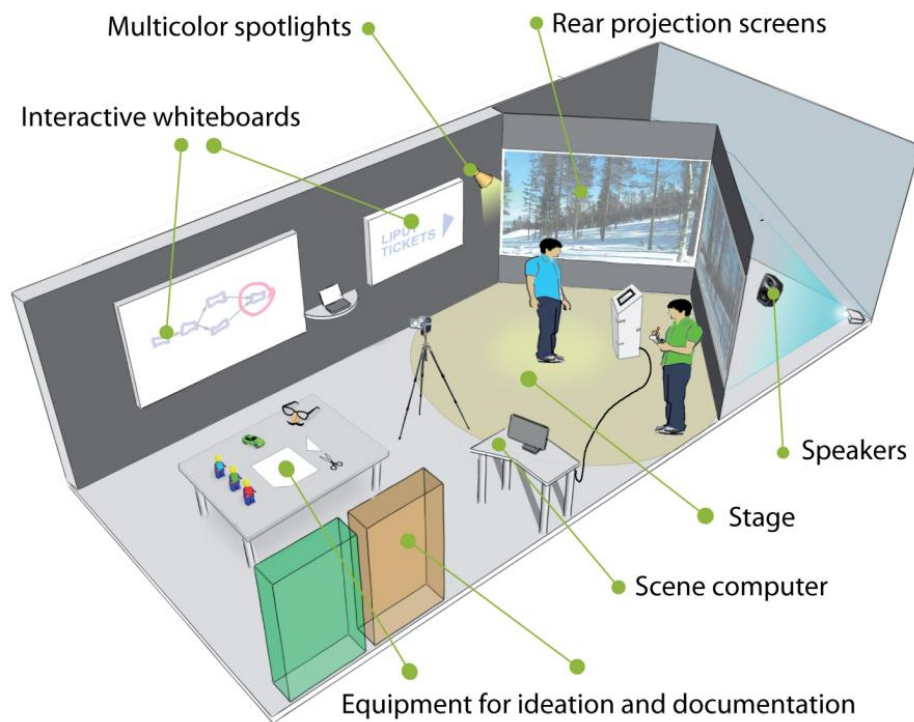


Figure 1. Overview of SINCO service prototyping laboratory

Functionally, the SINCO laboratory can be conceptualized under the following five terms: Servicescape Simulation; Service Stage; Digital Touchpoint Toolkit; Rough Mock-up Crafting; and Teamwork & Documentation Tools. We think none of these in itself is a new implementation - neither in terms of the technology used, nor the prototyping methods or aspects they are facilitating - but together they compose an inclusive laboratory concept for prototyping experiences and supporting design thinking through action.

4.1 Servicescape Simulation

We propose the term Servicescape Simulation to refer to the digitally created service scenes used in experience prototyping. By changing the imagery view, and the lighting

and sounds of the service scenes, the desired location of a service moment can be brought to the service prototype in a matter of minutes and saved for later sessions. A sequence of service scenes can be used as an experiential script by which customer journeys may be prototyped. As the set-up for servicescape simulation, we ended up using a pair of large background projection screens perpendicular to each other to provide the background scenery and enable partial, yet immersive spatiality. Loudspeakers are placed behind the screens to provide sounds that seem to emanate from the landscape. Multi-color spotlights help create the desired ambience (e.g., “blue dusk”).

Servicescape Simulation works as a platform for generating ideas and designing service touchpoints related to the service scenes of the customer journey. Concretizing the environment, where a service takes place, helps the participants to get perspective into the service being prototyped. By empathizing different stakeholder roles in prototyping, designers, customers or end-users can look at a service through different lenses.

Although the imagery is a very central part of the simulation, we have found sounds — even simple, suggestive, looping ones— relevant to immerse the actor into the service moment. PowerPoint™, or similar software, is used to control background images, videos, sounds, and transitions, which simultaneously helps with building an entire service path. Software also enables interaction between the people prototyping and the servicescape simulation; for instance, a queue number change presented as a blinking image and a sound clip for the prototyping customer sitting in a waiting room. Content for simulation is easily available from various internet media libraries, or can be gathered with digital recording devices.

4.2 Service Stage

The Service Stage is the place dedicated to acting out scenarios and experiencing the servicescape simulation. The stage itself has a strong analogy to a theater stage, which allows acting, whether you should empathize with a situation presented with a servicescape simulation or take the role of another user. Role-playing has been recognized as a very powerful method for observing and discovering aspects and elements in the service prototype (Buchenau & Fulton Suri, 2000). We found a service stage with role accessories and prop building blocks to be an encouraging area, even for people with no prior experience of role-playing.

While servicescape simulation with images and sounds effectively activates the user’s schema concerning the situation at hand, the service stage allows the supplementing of the virtual content with concrete spatial elements and interactions needed for prototyping the service. Rough and unfinished tangible mock-up elements support the idea of the service stage as an informal place, where wild ideas can be played out as incomplete experimentation is encouraged. This is important, especially in the early phases of the design process.

During later iterations, or when exploring specific technological opportunities and experiences, the digital prototyping accessories and content become more relevant. Digitally prototyped ideas, illustrated, for example, by analogous YouTube videos or existing user interfaces on the Internet, can be quickly composed on the servicescape simulation or presented separately among the tangible sets on the stage.

4.3 Digital Touchpoint Toolkit

The Digital Touchpoint Toolkit is a set of handheld devices used to prototype ideas with digital content. The Toolkit includes portable video projectors; small speakers; mobile

devices such as an iPad™; cameras; a large touchscreen; and a variety of accessories to mix and use the equipment in a versatile way.

The aim of prototyping with these technologies varies depending on the case and design process phase. At the front end of the process, a typical use is to explore technological opportunities or to reach the realistic “taste” and feeling of a new idea. In many cases, the “taste” is also achieved with an analogous exemplar (see, for example, Blomkvist, 2011). We have found this type of prototyping important, especially with sounds that are difficult to paper-prototype. Various alternative versions of touchpoints can also be quickly presented digitally within the entire service prototype. For example, in an interior-design-focused service design project, a sequence of different table cloth designs were projected onto the table surface while the test users were able to evaluate and compare the effect of each on the dining experience.

The digital toolkit is used in the early phase to transfer the quickly made paper prototypes to the right medium; for example with a web camera onto the screen of a user’s mobile device. In later iteration cycles and for communicating the design solutions to the client, interactive user interfaces can be prepared and tested separately or as a part of the whole prototype.

4.4 Rough Mock-up Crafting

A more traditional, but essential part of SINCO includes facilities for building mock-ups and “quick and dirty” experimentations. Mock-ups are images, models or dummies that illustrate or explain an idea (Moritz, 2005). Mock-up elements in service prototypes enable better realization of the service scene’s physical aspects, such as desks, counters or booths that play an essential role in the service. The idea of using mock-ups in service prototypes is to concretize features of elements from real service situations. They don’t need to be exact copies of elements they represent; mock-ups are meant to help evaluate hidden limitations, as well as the possibilities of a service’s physical elements.

A mock-up can be crafted using various methods and materials. Mock-ups can be made by paper-prototyping, using hot glue and foam materials, or combining existing artifacts and physical props. However, a quicker way to mock-up a vending machine can be achieved through bodystorming, which is a performance and improvisation method for taking the role of both the people and the things involved in services (Burns, Dishman, Johnson & Verplank, 1995). Building the very first idea mock-up is meant to be quick and its aim is roughly to represent a part of the features of the actual service. Depending on the role of the mock-up, its representation level can be visual; behavioral; functional; or any combination of these (Buchenau & Fulton Suri, 2000). If, during the prototyping, the need arises for a better mock-up in order to evaluate the prototype more precisely, a more detailed version of the mock-up can then be produced for following iterative prototyping rounds.

4.5 Teamwork and Documentation Tools

In design thinking principles, collaboration is vital throughout the entire process. Service design and service prototyping in particular are carried out in teams. Communication is essential between the prototyping team and the client, but also between the members of the interdisciplinary project team. Qualitative user study phases and information design are central activities in design calling for facilities supporting easy information visualization, sharing and documentation. The service design process takes place in smaller groups, and therefore constant documentation is necessary throughout the design process. For the SINCO service prototyping laboratory, teamwork and

documentation tools assist this part of the process enabling quick toggling between experience prototyping on the service stage and documenting the findings and ideas.

Digital documentation is optimal for storing, editing, sharing and analyzing the documented materials; therefore the majority of the documentation tools are digital. These tools include interactive whiteboards and a range of video and still cameras. Alongside the digital documentation formats, some of the documented material is still in physical form, such as cardboard and foam objects that have been created to concretize certain elements of the prototype. Therefore SINCO has a storage system, where all the separate projects have dedicated space to keep their unfinished materials safe between teamwork sessions.

5. Three case studies

SINCO laboratory's hands-on experience with service prototyping has come to include the client company's R&D staff more deeply in their service development. As a result, proposed customer experiences and service journeys make evaluating and innovating new solutions more concrete. Including the company's staff in the service prototyping through enacting, analyzing or developing service journeys, has given them the means to evaluate the service experience from the user's point of view rather than from the outsider's perspective.

Three service prototyping case studies with different companies: Lapin Kansa (local daily newspaper), Ranua Zoo (wildlife park in Lapland) and KL-Kopio (digital printing company) were used as research data. The cases were carried out between 2009 and 2011. They were part of courses for industrial design students and documented by them with visualizations, pictures, videos and reports. These three case studies, introduced in this chapter, will uncover how service prototyping methods and the SINCO laboratory were used in different phases of the service design process and how this also enhanced design thinking in the companies.

5.1. Case Lapin Kansa

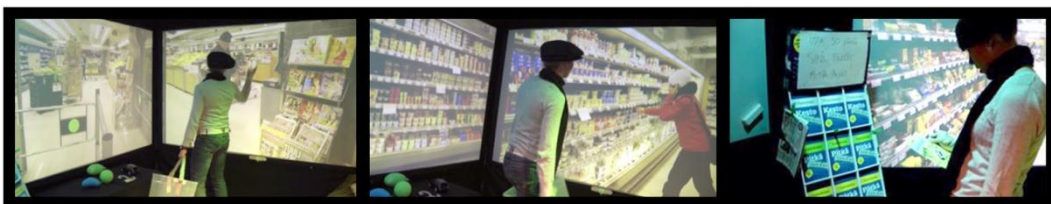


Figure 2. Prototyping the customer journey of a grocery store simulated at SINCO

In a student project for Lapin Kansa (a newspaper company in northern Finland), the aim was to develop the idea of newspaper subscriptions being sold as a concrete package in grocery stores. At the beginning, the customer journey of a store was photographed and illustrated as a servicescape at the SINCO laboratory. This worked as a platform for experience prototyping during the entire project. In the first phase, the student team deepened their customer insight by empathizing with the process of buying groceries and analyzing typical customer behavioral patterns. Various design challenges were identified and examined, such as where to place the sales stand to attract people for impulse buying and what could be the concrete thing to be sold. Several interaction design issues were also examined and solved through iterative prototyping, such as how to register the customer information with as few steps as possible and how to instruct a new customer in registering.

Interaction design appeared to play a key role in various service concepts. For instance, a customizable personal delivery calendar was found as a valuable add-on for a USB stick based subscription package concept. From the early user studies to the final concept, testing different levels of interaction design prototypes was continuously integrated into the holistic experience prototyping performed at SINCO laboratory.

The prototyping based service design process also helped the client company to shift from a product-oriented idea (package to be sold) to thinking about opportunities from the holistic shopping experience. In the follow-up student project this wider out-of-the-box thinking together with the continuous role-playing with the servicescape simulation of the customer journey lead to a subscription kiosk concept idea. In this concept the user interface design and iterative prototyping appeared as a crucial point to enable a quick and easy purchase in a food store as impulse buy. The digital touchpoint toolkit equipment enabled quick experimentations of, for example, an “attention screen” showing daily news or timely campaigns using existing web content as well as quick paper and digital screen mock-ups.

While the service prototypes performed at SINCO worked as tangible experimentations for the design team they also enabled the concretization of the user point of view as an experiential walk-through for the client company representatives. We found it important to take the client company members along the experience prototypes in some of the stakeholders’ roles. It helps the service providing company to better understand the design challenges and new ideas, as well as enabling them to participate in improving ideas rather than following passively alongside.

5.2. Case Ranua Zoo



Figure 3. Designing a tourist experience with service prototyping methods

Ranua Zoo is a wildlife park located in Ranua and it is one of the leading tourist attractions in Finnish Lapland. A SINCO-based student project was conducted with the company, in which the aim was to create a new fascinating service concept for visiting tourist families during the Christmas season.

During the first phase of the project, participating students visited the Ranua Zoo, interviewed employees and took the tour around the wildlife park with other visitors. Students experienced the service environment themselves, but also took notes of other people’s actions during the tour. Lots of material was gathered for ideation in the form of videos, photos and notes. Ranua Zoo representatives also gathered ideas in a workshop before the project, which they shared with the students to aid their ideation.

After the visit, the students started to generate ideas for the new service, and build an experience prototype of it for testing and evaluating. The idea of combining storytelling to this challenging environment to create a fairy tale-like experience was recognized as a new kind of service opportunity for this otherwise strongly traditional service. Not only was the customer journey of the visit in the wildlife park defined, but also interactions between customers and “the story” before and after visiting Ranua Zoo. For instance, the phases taking place in customers’ home before the trip to Finland had even started were connected to the storyline through related marketing material and web content.

During the development process, the versions of the experience prototype served as a platform for developing the concept, but also as a communication tool to discuss with the subcontractors and other stakeholders who played crucial part in producing the new service concept. This also helped Ranua Zoo management to understand the benefits of design thinking and prototyping in creating new service concepts.

The finalized experience prototype of the service concept was presented to Ranua Zoo representatives. After their positive feedback and approval, the concept was further developed with graphic and textile and clothing students of the University of Lapland. Service Stage also had a role in prototyping different design concepts for the restaurant environment in Ranua Zoo. Students used techniques like digital image projection on table surfaces and servicescape images that were modified to match with different settings. This gave a more concrete way to evaluate different options before proceeding to build physical prototypes of the elements for the service concept.

5.3. Case KL-Kopio



Figure 4. Prototyping digital printing services with role-play

While the SINCO facilities can help in developing novel concepts as experience prototypes of different future storylines, we have also found service prototyping a valuable tool for improving already existing and running services. In a student project for the digital printing company KL-Kopio, the focus was on developing the company's existing service. While the service in its present form was running at the company's premises, the students were able to test, record and analyze the current service as a prototype at the SINCO laboratory.

The service prototype made it possible for the students to generate ideas and test them out by themselves, thus developing the ideas through iterative phases. Without any worries of disturbing existing business processes, the students were able to test even wilder ideas. The first prototype was a quickly made, rough representation of the service environment, but the iterative cycles better specified the needs for changes, and so the physical fidelity of the prototype was increased during the process.

Part of the service was also developing user interaction with digital devices incorporated into a service concept. Students also developed mock-ups for the user interface, which would be an essential part of a digital printing service. Requirements for user interaction, in both the digital user interface as well as physical aspects, were recognized through prototyping. Role-playing helped the students and the company representative to change their mindset to watch the service process from a customer perspective.

It was also noticed during the project, that when a company representative participated in the development and prototyping process, his resistance to change from the early stages of the project was transformed into participative co-creation. This was also important, when aspects of an enhanced service were ramped up into production at the company's premises. Prototyping helped company representative to also see the downsides of their current customer services space. Along with the new service concept, the company also gained knowledge about service design methods and tools for prototyping, as well as a better understanding of customer service situations holistically.

6. Conclusions

Through our cases we have found service prototyping to be a useful activity for developing, evaluating and communicating ideas and emerging service concepts. It helps with concretizing immaterial ideas, and facilitates both user-centric thinking and out-of-box ideation of the participating stakeholders, including the design team, company staff, their subcontractors and end-users. A customer journey walk-through augmented with Servicescape Simulation can also awake the entrepreneur to see the undesirable status quo of the customer experience.

We have recognized a need for more suitable software for prototyping, which could be used for controlling the digital aspects of the simulation, comprehending the service process and gathering the results of ideation simultaneously. Now this kind of service prototyping software is under development in collaboration between the University of Lapland and Rovaniemi University of Applied Sciences, and its first version is expected to be released during 2012.

The framework for a service prototyping lab is ready alongside the first built physical environment of it, but we are still continuing the development, investigation and experimentation of the methods, tools and ways of working to increase the knowledge around service prototyping. Regardless of the extensive amount of action research around this topic, it still calls for evidencing through in-depth academic research, both qualitatively and quantitatively.

The common view and practice on how the methods and processes of service design should be used for service prototyping is still lacking, yet a wide range of experimentation can be seen to be going on in this area (Blomkvist & Holmlid, 2010). The SINCO laboratory with both its physical facilities and working principles is an attempt to be an approachable method for both academic and business teams to realize design thinking in practice. It aims to provide a rough but sufficient multi-sensual reference to the authentic environment where the service takes place and where the participants of prototyping can sense the service experience and bring out ideas and suggestions to improve the service, that otherwise might have been left uncovered.

References

- Blomkvist, J. (2011). *Conceptualising Prototypes in Service Design*. Faculty of Arts and Sciences Thesis No. 101. Department of Computer and Information Science, Linköpings universitet. [online] Retrieved June, 2011, from <http://liu.diva-portal.org/smash/record.jsf?pid=diva2:412916&rvn=2>
- Blomkvist, J. & Holmlid, S. (2010). Service Prototyping According to Service Design Practitioners. *ServDes. 2010. Second Nordic Conference on Service Design and Service Innovation*. Linköping, Sweden.
- Brown, T. (2008). Design Thinking. *Harvard Business Review*, June 2008, 84-92.
- Buchenau, M., & Fulton Suri, J. (2000). Experience Prototyping. *Proceedings of the 3rd conference on Designing interactive systems: processes, practices, methods, and techniques, DIS '00*. Brooklyn, NY, USA.
- Burns, C., Dishman, E., Johnson, B., & Verplank, B. (1995). "Informance": Min(d)ing future contexts for scenario-based interaction design. Presented at BayCHI, Palo Alto. Abstract available at: <http://www.baychi.org/meetings/archive/0895.html>
- Engine, (2009, 6 May). Engine Group. Retrieved 6 May, 2009, from <http://www.enginegroup.co.uk/>
- Fulton Suri, J. (2008). Informing Our Intuition, Design Research for Radical Innovation. *Rotman Magazine*, Winter 2008, 53-55.
- Gould, J.D. and Lewis, C. (1985). Designing for Usability: Key Principles and What Designers Think. *Communications of the ACM*, March 1985, 28(3), 300-311.
- Holmlid, S. (2007). Interaction Design and Service Design: Expanding a Comparison of Design Disciplines. *Design Inquiries 2007 Stockholm*. Retrieved 3 January, 2012, from <http://www.nordes.org/data/uploads/papers/143.pdf>

- Holmlid, S. (2009). Participative, co-operative, emancipatory: From participatory design to service design. *First Nordic Conference on Service Design and Service Innovation*. Oslo, Norway.
- Holmlid, S., & Evenson, S. (2007). Prototyping and enacting services: Lessons learned from human-centered methods. *Proceedings from the 10th Quality in Services conference, QUIS 10*. Orlando, Florida.
- ISO 9241 - 210 standard (2010). International Standard: Ergonomics of human - system interaction – Part 210: Human - centred design for interactive systems. First version 2010 - 03 - 15. Reference number: ISO 9241 - 210:2010 (E).
- Keinonen, T. (2009). Design Contribution Square. *Advanced Engineering Informatics*, 23, 142-148. doi: 10.1016/j.aei.2008.10.002.
- Kelley, T., & Littman, J. (2001). *The Art of Innovation: Lessons in Creativity from IDEO, America's Leading Design Firm*. New York, USA: Random House inc.
- Kurvinen, E. (2007). *Prototyping Social Action*. Publication series of the University of Art and Design Helsinki A 75. Vaajakoski, Finland: Gummerus Printing.
- Lockwood, T. (Ed.) (2010). *Design thinking: Integrating innovation, customer experience, and brand value*. New York, NY: Allworth Press.
- Mager, B. (2009). Introduction to Service Design. Digital communications tool. Culminatum Innovation. Retrieved 1 May, 2009, from <http://www.share2solve.org/introtosd/start/Main.html>
- Miettinen, S. (2011). Service Design: New Methods for Innovating Digital User Experiences for Leisure. In M. Lytras, P. Ordóñez de Pablos, E. Damiani & L. Diaz (Eds.), *Digital Culture and E-Tourism: Technologies, Applications and Management Approaches* (pp. 36-47). USA: IGI Global.
- Moritz, S. (2005). *Service Design. Practical Access to an Evolving Field*. Köln International School of Design. Cologne: University of Applied Sciences. Retrieved 20 April, 2009, from http://stefan-moritz.com/welcome/Service_Design_files/Practical%20Access%20to%20Service%20Design.pdf
- Samalioinis, F. (2009). Can Designers Help Deliver Better Services? In S. Miettinen & M. Koivisto (Eds.), *Designing Services with Innovative Methods* (pp. 124-135). Kuopio Academy of Design, University of Art and Design, Helsinki B 93.
- Tassi, R. (2009). Service Design Tools: Tools Provenance Map. [image] Retrieved 20 September, 2011, from http://www.servicedesigntools.org/sites/default/files/TOOLS_PROVENANCE.jpg
- Van Oosterom, A. (2009). Who do we think we are? In S. Miettinen & M. Koivisto (Eds.), *Designing Services with Innovative Methods* (pp. 162-179). Kuopio Academy of Design, University of Art and Design, Helsinki B 93.
- Winhall, J. (2011). Case Study 11 Designing the Next Generation of Public Services. In A. Meroni & D. Sangiorgi (Eds.), *Design for Services* (pp. 131-138). UK: Gower Publications.

Writer Biographies

Satu Miettinen (D.A.) works as professor of Applied Art and Design in the University of Lapland, Department of Industrial Design. For several years she has been studying and developing service design and social design practice in multiple projects. She is actively working with writing and editing service design research literature.

satu.miettinen@ulapland.fi

Simo Rontti (M.A.) works as university teacher of Industrial Design in University of Lapland. Main research and teaching areas are service prototyping, user-driven innovation process and new product development, latter with several years of experience as in-house designer in playground equipment industry.

simo.rontti@ulapland.fi

Essi Kuure (M.A.) graduated from the University of Lapland, Department of Industrial Design. She has worked for several years at the University on multiple service design projects and focused on knowledge and methods of customer insight, concepting and prototyping.

essi.kuure@ulapland.fi

Antti Lindström (undergrad.) works as research assistant in University of Lapland, Department of Industrial design. He has been involved closely in the development of SINCO service prototyping laboratory, focusing on implementation of technical equipment in the service prototyping process.

antti.lindstrom@ulapland.fi