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ServDes.2012

CO-CREATING SERVICES

Edited by

Päivi J. Tossavainen, Milla Harjula and Stefan Holmlid



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The 3rd Service Design and Service Innovation Conference,
ServDes.2012 CO-CREATING SERVICES

Edited by
Päivi J. Tossavainen
Milla Harjula
Stefan Holmlid

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Snowy and freezing weather did not numb the ServDes enthusiasts! **Laurea University of Applied Sciences** hosted the 2012 edition of ServDes Conference. Laurea SID Leppävaara campus is located in World Design Capital 2012 area, Espoo, next to Helsinki. This year the theme was co-creating services. The Service Design and Service Innovation Conference, ServDes, is the premier research conference within service design and service innovation. The 3rd Service Design and Service Innovation Conference was held on 8-10 February 2012. The snowy Finland provided new experiences for some of our participants. As a part of World Design Capital activities and one of the biggest events in the category of Encounters (“Kohtaamisia”), ServDes.2012 practically kicked off the World Design Capital Year 2012 in metropolitan Helsinki.

Following the traditions of Laurea, we threw ourselves into service design and innovation world with high hopes and optimistic expectations. And we succeeded: We have experienced from the first hand a service design and experience journey of all times! Based on the happy faces, co-creative atmosphere, and vivid discussions during the conference, we think, we had quite a many happy co-travelers during this journey. Our small but energetic conference Organizing Committee started the work in early 2011. The team was supported by the ServDes program committee. Further, we got a lot of support from the Laurea UAS. The organizing Committee decided at very early stage to co-create our own unique design for the conference program: Preconference day, Research day and Business day.

The first day, the preconference day, provided experiences of a service design journey (workshops tour) with pre-selection from nine interesting workshops. Each group was led by B.Sc. students throughout the metropolitan area. We thank our partners in co-creating these workshops: the starting point was WeeGee Exhibition Centre, followed by TBWA, Design Reform Ltd, Atwork, Terveystalo Ltd., Aalto University, Aleksander theater & Workplayexperience, Hanken School of Economics, and Hanasaari. We appreciate the time and effort of the workshop organizers. The Service Design Journey ended at BioRex @ Lasipalatsi, where participants gathered to share their experiences and enjoy refreshments. The second day, the research day, followed the more traditional aspects of the academic conferences. The day started with key note on introduction to Cambridge Service Alliance network presented by Chris Pearson. Then 3 selected research papers were presented for the whole audience. After lunch, the audience broke into parallel tracks. Altogether, 79 submissions were received for the conference, and some 40 accepted. Acceptance rate was 65%. A large body of reviewers (see the list at the end of the proceedings) selected the papers to be presented. We appreciate the work of volunteer reviewers! Gripping Martti Vannas, the Master of Ceremony hosted the GalaDinner @ very special location of Ritarihuone, The House of Nobility. The House of Nobility keeps personal data of all Finnish noblemen from the Middle Ages onwards. In all 357 noble families are registered. Of these 148 families, are represented today.

The assembly hall of 464 square metres provides a magnificent setting with walls of coat of arms (shields). The evening ended at dance floor with the rhythms provided by captivating Jumpers –band.

The third day, the business day, was our approach to combine more business oriented matters and professionals interested in service design. And to create a practice-makers and academic researchers an option to share information and discuss. We had three excellent Scandinavian key note speakers in the morning: Professor Evert Gummesson from Stockholm University School of Business talking about designing a Complex Service System. Then Anne Stenros, Vice President Design at Kone Corporation talk about Emotional Engagement & Consumerisation of Innovation. This was followed by Anna Thygesen from Prime Time Kommunikation sharing her experiences with customer-centricity. Further, we had several workshops the participants could select and interactive Business Bazaar.

ServDes.2012 interested 276 registered persons. Over 20 different nationalities worldwide were present. Over 40 Laurea BSc students supported the event by planning, preparing, hosting, and helping throughout the conference. Crowsorting platform “Presemo” was tested during the conference. We had also one book launching. And one snowball fight! We experienced unparalleled social media coverage throughout the conference activities! Thank you all for posting info on social media. On behalf of the organizing committee, we express our humble thanks to everyone supported or participated ServDes.2012. We also appreciate the continuing work and support of ServDes Program Committee. Let’s all meet in Lancaster 2014!

SID Leppävaara campus, March 2012

Päivi J. Tossavainen, D.Sc.
ServDes2012 Organizing Committee

Milla Harjula, BSc.
ServDes2012, Project Manager

| Index of papers¹ | page |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| <i>Aro, P., Heinonen, M., Parkkola, T., Vironmäki, E., Ahola, H., Iso-Aho, J., Järvelä, M-L., Kerola, R., Reijonen, K. & Vuorela, T.</i> Co-Learning Service Design within the PALI Project | 1 |
| <i>Agudelo, N., Flechas, A. & Antolínez, L.</i> Co-created tools for teaching, learning and designing services in Colombia: Facilitating interdisciplinary learning in service design innovation | 9 |
| <i>Arvola, M., Blomkvist, J., Holmlid, S. & Pezone, G.</i> A Service Walkthrough in Astrid Lindgren's Footsteps | 21 |
| <i>Bailey, S., G.</i> Embedding service design: the long and the short of it: Developing an organisation's design capacity and capability to sustainably deliver services | 31 |
| <i>Blomkvist, J., Åberg, J. & Holmlid, S.</i> Service Walkthrough to Support Service Development | 43 |
| <i>ten Bhömer, M., Tomico, O., Kleinsmann, M., Kuusk, K. & Wensveen, S.</i> Designing Smart Textile Services through value networks, team mental models and shared ownership | 53 |
| <i>Cantù, D., Corubolo, M. & Simeone, G.</i> A Community Centered Design approach to develop service prototypes | 65 |
| <i>Carlsson, B.</i> The Ethical Ecology of Service Design - an explorative study on ethics in user research for service design | 71 |
| <i>Guseynova, N.</i> Emotions in design process: How to find an emotional touchpoint with the user | 77 |
| <i>Henze, L., Mulder, I., Stappers, P., J. & Rezaei, B.</i> Right Service & Service Right: How collaborating heterogeneous networks at the front end of service development benefit the process to get the service right | 83 |
| <i>Holmlid, S.</i> The first case experience of designing for service | 93 |
| <i>Kaptelinin, V. & Uden, L.</i> Understanding delegated actions: Toward an activity-theoretical perspective on customer-centered service design | 101 |
| <i>Kim, Y. S., Lee, S. W., Kim, S. R., Jeong, H. & Kim, J. H.</i> A Product-Service Systems Design Method with Integration of Product Elements and Service Elements Using Affordances | 111 |
| <i>Kronqvist, J., Järvinen, M. & Leinonen, T.</i> Games as Design Medium: Utilizing Game Boards for Design Enquiry with Cancer Patients | 121 |

¹ We apologize for the variation in templates and formats used

| | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <i>Kwon, O., van Boeijen, A.</i> Co-designing an SMS service for London's homeless people: Considerations for designers engaging with a vulnerable user group | 133 |
| <i>Molinari, F.</i> User Experience Analysis in Service Co-Creation: A Living Lab Approach | 147 |
| <i>Negri, A-L., Trousse, B. & Senach, B.</i> Ideation of IoT services with citizen: coupling GenIoT and AloHa! methods | 157 |
| <i>Nisula, J-V.</i> Searching for Definitions for Service Design – What do we mean with Service Design? | 171 |
| <i>Näkki, P.</i> Service co-design using online ideation and face-to-face testing: Case City Adventure | 177 |
| <i>Patrício, L. & Fisk, R. P.</i> Giving Voice to Service Design in the Management Boardroom: Strengthening the Connection between Service Design and Management | 189 |
| <i>Peethambaran, A.</i> Developing ICT based services for Intellectually Disabled People | 199 |
| <i>Pries, J. F. F., van Boeijen, A., G. C. & van der Lugt, R.</i> Deep inside friendly territory: Involving remote co-researchers to understand global users | 205 |
| <i>Rasila, H.</i> Using employee insights in fine-tuning the customer experience | 217 |
| <i>Rontti, S., Miettinen, S., Kuure, E. & Lindström, A.</i> A Laboratory Concept for Rapid Service Prototyping: Service Innovation Corner (SINCO) | 229 |
| <i>Sandberg, F-</i> Co-creating service opportunities through work context maps | 243 |
| <i>Sangiorgi, D., Fogg, H., Johnson, S., Maguire, G., Caron, A. & Vijayakumar, L.</i> Think Services: Supporting manufacturing companies in their move toward services | 253 |
| <i>Takeyama, M., Tsukui, K., Yamaguchi, H. & Motai, G.</i> Open Experience Journey Design: Developing an approach to the collaborative user-driven ideation for innovative services | 265 |
| <i>Tanghe, J.</i> The rebirth of the SERVQUAL gaps model in service design | 273 |
| <i>Trischler, J & Sinnewe, E.</i> The concept of on-going interactions in co-design: Insights from three different disciplines | 277 |
| <i>Yip, M., H., Phaal, R. & Probert, D. R.</i> Value co-creation in early stage new product-service system development | 287 |

Cases presented

Patrik Axelsson, Jonathan Hise Kaldma, Rasmus Sellberg: Designing the Future of Broadcasting

Robert Grossi, Christopher Ferguson: Co-Creating A Customer-Centric Commercialization Strategy For A New Soile Juujärvi, Minna Hägg: Change Laboratory as a method of co-creation for community development

Henna Kärkkäinen, Lotta Hassi: Case: Instant experimentation of Services - Co-creating a better user experience in a public park

Reetta Maila, Jussi Ekqvist, Sara Ikävalko: How the utilization of lead users changed cashier service

Liliana Rodriguez, Ellie Lockley: Interdisciplinary working in service design: case studies for designing touch points

Minka Rössner, Annika Hertz-Schlag, Christian Junker: Join to Create - Hybrid value creation through partnering

Andrew J. Sedlak: Discussing Service Design within "Group Genius" Blockbuster Drug

Workshops in main schedule

Robert Bau: Strategy Paradoxes in Services

Bernhard Dusch : From attitude to action - co-creating sustainable products and services

Krista Keränen : Value Co-creation:

Menno Manschot, Froukje Sleeswijk Visser: Involving users: worth your money

Vanja Misic, Minka Rössner, Fabian Segelström: Sdnext - Moving towards the creation of a PhD network in service design:

Marc Stickdorn, Marcus Hormess: How to design a service business model

Sebastian Tauciuc: Workshop: Design for Social Impact

Hazel White, Stefan Holmlid, Katarina Wetter Edman, Elena Pacenti, (tbc) Birgit

Mager: What Do Tomorrow's Service Designers Need to Know?

Gijs van Wulfen : The FORTH innovation method: Creating Innovative Services for Sanoma

Other workshops

Pre-conference day

Creating service ideas for WeeGee: Creative and guided brainstorm with participants

- WeeGee Exhibition Centre & Laurea UAS/Fjord

Hospitality case - Hanasaari & Laurea UAS

Theater methods - Aleksander theater & Workplayexperience

Designing public services - Aalto University

Service design health care case - Terveystalo Ltd.

Fast from ideas to practice - TBWA, Marketing agency

Public services - Design Reform Ltd. & Zone Interactions Ltd.

Interaction analysis and implementation for service encounters – Atwork

Service stories - Hanken School of Economics

Friday

SINCO lab: Servicescene simulation in action: Essi Kuure, Antti Lindström, Simo Rontti

Solving wicked challenges by co-design: Culminatum Innovation Oy Ltd/Jussi Sorsimo

Ruukki Case: TBWA/Lauri Toivonen

Helping people and companies to like each other: 358/Anton Schubert

Mapping Critical skills for designers and researchers: Karen Miller

Theater Methods: Workplayexperiences/Markus Hormess

Finnish Nature case: Visit Espoo: Jaana Tuomi

Personal Public Transportation: Ajelo & Aalto/ Petri Tolppanen, Timo Halko

Customer Skill and Activity in service usage: Jacob Mickelsson

What to do and don't do in service design: Palmu/ esa Rauhala

Anticipation of Service 2.0: In Exploration of the next Generation of Services: Mahmoud Abdel-Rahman, Mr. Abdalla

Co-Learning Service Design within the PALI Project

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Abstract

Small- and medium-sized enterprises (SMEs) rarely apply the methods of service design in developing their businesses. In part, this arises from the shortage of available service design expertise. Universities of applied sciences (UASs) have acknowledged the need for service design education, but do not yet have enough experience and practical knowledge to include the studies into curricula.

The PALI project (Competitive Advantage through Service Design) facilitates co-learning of service design amongst UASs. The project is a collaborative effort of HUMAK, Novia, Oulu and Savonia UASs, which form an interdisciplinary environment with several educational fields; tourism, cultural management, design and business administration. Co-learning in the project is based on real-world service development cases implemented in co-creation teams of UAS staff, UAS students and SME representatives.

This paper looks at how the co-learning environment has been constructed throughout the project. The most crucial question turned out to be knowledge transfer, which has been based on an iterative cycle consisting of three phases; progressing, learning by doing and reflecting. The challenge of integrating teaching and research has been addressed by creating a Broker model in which each UAS has a service design expert acting as a project generator between the UAS and SMEs.

KEYWORDS: service design, case study, learning, knowledge transfer, interdisciplinary

Introduction

Small- and medium-sized enterprises (SMEs) are faced with a need to develop their business operations and service innovation activities towards a more customer-oriented direction. This may be achieved with the help of the methods of service design, which are presently rarely applied by the SMEs. At the same time, service design has not yet established itself as an operational tool kit for business development in the Finnish universities of applied sciences (UASs). There is a growing interest in the methods, but not yet enough experience and practical knowledge of the best ways to include them into curricula.

PALI (“PALvelusta LIiketoimintaa”), or Competitive Advantage through Service Design, is a research project funded by the Finnish Funding Agency for Technology and Innovation (Tekes), and the participating UASs and SMEs. In this one-year project, HUMAK, Novia, Oulu and Savonia UASs joined their forces in 2011 to explore with service design methods together with their students and with 20 SMEs from different parts of the country operating in different fields of business. In the PALI project, the following research questions were tackled:

- What is the present level of service know-how in the Finnish SMEs?
- How to increase the SMEs’ know-how in the field of service business?
- How to strengthen the role of UASs in providing SMEs with know-how in the field of service business?
- How to construct an interdisciplinary service design clinic to manage the transfer of know-how from UASs to SMEs?

The approach used is a combination of qualitative and quantitative methods. In addition to the approaches of learning by doing and co-creation, a quantitative survey on service know-how among SMEs nationwide was conducted to provide background information. As a whole, the research strategy is based on case study methodology.

This paper looks at how a co-learning environment has been constructed throughout the project. What are the elements and processes when implementing service design methods through a learning by doing approach? In other words, how do we identify the “pain”, what kinds of “painkillers” should we use, what are the benefits and how are the actors reacting in the process? This will include the perspectives of all the stakeholders; UAS staff, UAS students and company representatives. What are the lessons we have learnt?

Methodology

The study is conducted using case study strategy, as case studies may offer insights that might not be achieved with other approaches. We are at an exploratory stage of our study, and case studies have often been viewed as a useful tool for the preliminary stage of a research project, as a basis for the development of more structured tools. We also need answers to ‘How?’ and ‘Why?’ questions. Furthermore, our case is a contemporary event where the relevant behaviour cannot be manipulated. Typically, case study research uses a variety of evidence from different sources, such as documents, artefacts, interviews and observation. In a case study, an investigation into a phenomenon in its context can be undertaken; case study research may be based on any mix of quantitative and qualitative approaches. (Rowley, 2002.)

The research context in our case study is the above in section 1 described PALI project. Research design is the logic that links the data to be collected and the conclusions to be drawn to the initial questions of a study, or an action plan for getting from the questions to conclusions. It should ensure that there is a clear view of what is to be achieved by the case study. This involves defining the basic components of the investigation, such as research questions and propositions. Theoretically, our research phenomenon relates to value creation and services marketing (Edvardsson, et al., 2011; Grönroos, 2010; Grönroos and Ravald, 2011). In our project, we have a project plan with goals, which define the previously presented purpose and questions for our study. The study’s unit of analysis is the project itself. It is a unique case.

Data collection was guided by a case study protocol defined in the project plan including an overview of the project, field procedures, such as use of different sources of information, and access arrangements to these sources. In this case study, multiple sources of evidence (data) were used. These include documents, archival records, interviews, direct observation, participant observation, project meetings, workshops, and physical artefacts. For example, a research report on the present level of service know-how in the Finnish SMEs, and also process descriptions on the service development cases have been used. These different sources yield different kinds of insights. Whatever the sources of evidence that are used, there are three key principles of data collection that need to be observed; triangulation, case study database, and chain of evidence (Rowley, 2002). We need further work on analysing our exploratory results by examining, categorizing and tabulating. In exploratory case studies, an alternative analytic strategy is to develop a descriptive framework for organizing the case study (ibid). The descriptive framework for our case study of Co-Learning Service Design within the PALI Project consists in brief of the following themes:

- knowledge transfer
- co-learning amongst the UASs and within each UAS
- co-creation teams of UASs and SMEs
- “lessons learnt” or propositions for further research

According to the research approach defined by moderate constructionism and abduction (Järvensivu and Törnroos, 2010), we are in the phase of finding the research focus. The next phase will be extending the research framework, case analysis, and finally assessing validity and transferability.

Implementation

The project is being implemented in four work packages, as presented in the following Figure 1. In the first three work packages, both quantitative and qualitative data has been produced to be processed into a service design how-to guidebook for SMEs, intermediary umbrella organizations and UASs. At the end of the project, a national seminar will be organized for the purpose of experience and know-how distribution.

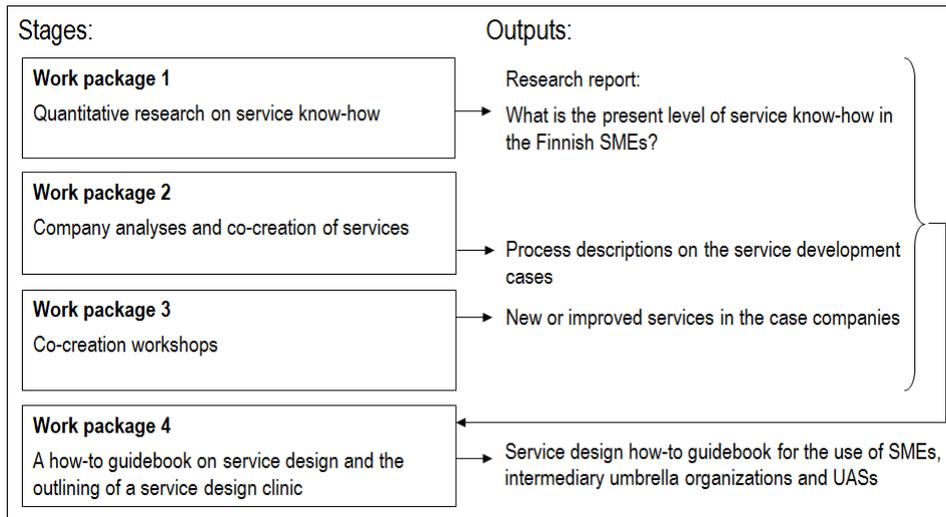


Figure 1 Project stages and outputs

The first work package produced background information for the forthcoming business development cases. The quantitative survey concentrated on the following research questions:

- How do Finnish SMEs perceive the significance of service competence for their business operations (product orientation vs. customer-driven service orientation)?
- How do Finnish SMEs perceive the level of their service competence?
- How do Finnish SMEs utilize their customers in developing their business operations?

Altogether 104 company representatives from a wide range of industries responded to the electronic questionnaire. The results suggest that service competence is perceived to be slightly more important than product know-how for SMEs' business operations. The subjective perception of the present level of service competence in terms of SMEs' service preconditions and service quality settled above average on a scale from 1=poor to 4=excellent. As for customer-oriented development, as much as over 70 per cent of SMEs seem to utilize their customers in developing their business operations. Service design was reported as a familiar concept by 31 per cent of the respondents.

The second and the third work package involve co-learning amongst the participating UASs and within each UAS, as well as co-creation of services in teams of UAS staff, UAS students and company representatives. The related activities have run parallel throughout the project.

Co-learning began with a kick-off meeting in January 2011. In the meeting, the project plan was reviewed and the principles of project work were established. In addition, Professor Satu Miettinen introduced service design as an approach to the project group. The next face-to-face project group meeting took place in March 2011 in a service design workshop instructed by Professor Satu Miettinen. The goal was to further familiarize the project group with the service design methods and tools. After the workshop, the actual hands-on work in the case companies was launched. Later in the year, two more face-to-face meetings were organized; the project group met in September 2011 at the Service Design Conference in Tallinn, and again in November 2011 to conduct further work on the project's business development cases in the University of Lapland's SINCO (Service Innovation Corner) prototyping lab. Besides the face-to-face meetings, the project group has had monthly telephone meetings, which have been planned and recorded.

The main means of co-learning, however, have been the service co-creation activities. The hands-on work in altogether 20 case companies began with defining the development target in each SME. The next phase, identification and discovering, focused on understanding the customers, the service contexts and the business environments. The process continued with concepting and designing phases, which involved visualization, co-creation and participatory design. As a result, a new or an improved service was designed for each of the case companies. In some case companies, the process is still on-going. Due to the limited project duration, the phases of building, implementing and measuring were excluded. Thus, the project has concentrated especially on understanding and generating.

The "pearl" of the co-creation activities have been the total of 18 co-creation workshops co-directed by Service Designer Reetta Kerola. The focus of the workshops has been in teaching the UAS staff, the UAS students and the company

representatives how to apply the methods and tools of service design in their own projects, and to show them how these projects can benefit their customers. The framework for the workshops is presented in the following Figure 2.

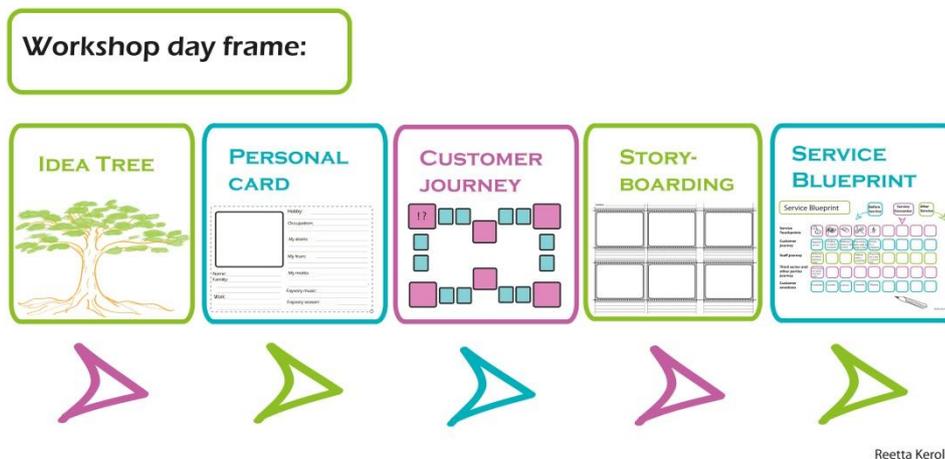


Figure 2 Workshop day frame

All of the selected tools are based on visual understanding, as visualization is a key tool in service design. Visual presentations help in bringing together the different ways of discussing the subject at hand. Ideally, the group of workshop participants includes company staff with diverse positions and responsibilities, and a varied mixture of present and potential customers. An expert on service design guides the group through the goal of processing existing ideas into new ideas for service concepts. In the process, a relaxed atmosphere is important to ensure that every participant's voice is heard.

The first of the tools selected for the workshops, Idea Tree, presents the thoughts of both the company and the customer representatives, and thus gives a solid background to the challenges at hand (Johnson and Shneiderman, 1991). A large poster with a picture of a tree is used with branches spreading on both sides; one side is for the thoughts of the company representatives and the other for the customers' opinions. The branches are named with different topics, which encourage the group to think of the various values, needs and challenges of both parties. (Hyysalo, 2009; Hämäläinen, Vilkkä and Miettinen, 2011; Miettinen, 2011.)

The next tool, Personal card, is commonly used in service design to map the different customer journeys. In using the tool, the first step is to define the target group, after which three to four different customer profiles are created. This may be done either by interviewing one person at a time or by interviewing several people and hence getting an idea of a target group's needs. Besides factual information, the "soft" emotions-related values are considered; e.g. the lifestyles the customers prefer, and the kinds of dreams and fears they may have. (Mager, 2009; Miettinen, 2009; Hämäläinen, Vilkkä and Miettinen, 2011.)

With the fourth method, Storyboarding, comic strips are used to express story-like scenarios of enhanced customer profiles and service situations. The task is to visualize how the service could be improved, if there were no limitations, but anything was possible. This method is most effective when working in small teams where everyone can express their ideas freely. (Kelly, Raijmakers and van Dijk, 2010.)

The last method selected for the workshops, Service Blueprint (see Figure 3 below), can be used to fill the storyboard scenarios with more detail. The purpose is to understand the different levels of each step on the service timeline; service touchpoints, or the tangible aspects involving spaces, objects, people and interaction, customer journey, staff journey, and the journey of other parties. (Miettinen, 2009; Kelly, Raijmakers and Dijk, 2010; Koivisto, 2009.)

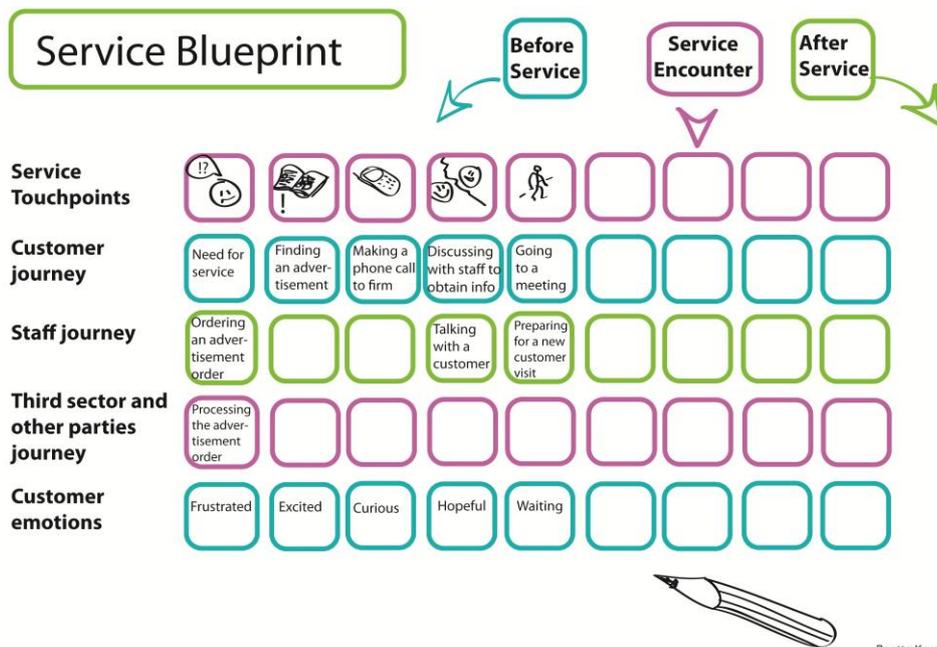


Figure 3 Service Blueprint

Reetta Kerola

As a whole, the co-learning and the co-creation activities have involved a large group of people, as illustrated in the following Table 1. The participants varied in their educational and professional backgrounds, as well as in their relationships with the development tasks at hand. Thus, the platform for co-learning service design within the PALI project has been genuinely interdisciplinary.

| | |
|----------------------------------------------|-----|
| Total number of UAS staff involved | 31 |
| Total number of UAS students involved | 105 |
| Total number of SME representatives involved | 37 |
| Total number of customers involved | 53 |
| Total number of participants | 226 |

Figure 4 Table 1 Scope of the project activities

From the viewpoint of UAS education, the project has produced 366 RDI-related credits (ECTS) constituting 9 772 hours of effort by UAS students. The total number of publications that are in progress is 11.

Conclusions

The most crucial question in learning service design within the PALI project turned out to be knowledge transfer, both between the participating UASs, and from them to the participating SMEs. The process of knowledge transfer was based on the knowledge transfer model summarized in the following figure 4. In the model, there are three phases to systematically increase the participants' service design competence. The foundation of the model lies in a cycle of continuous development.

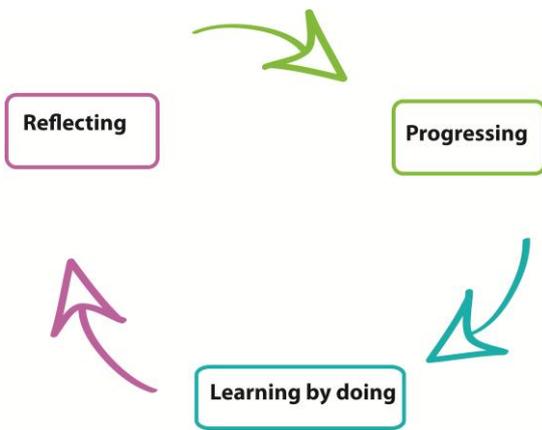


Figure 5 Knowledge transfer model

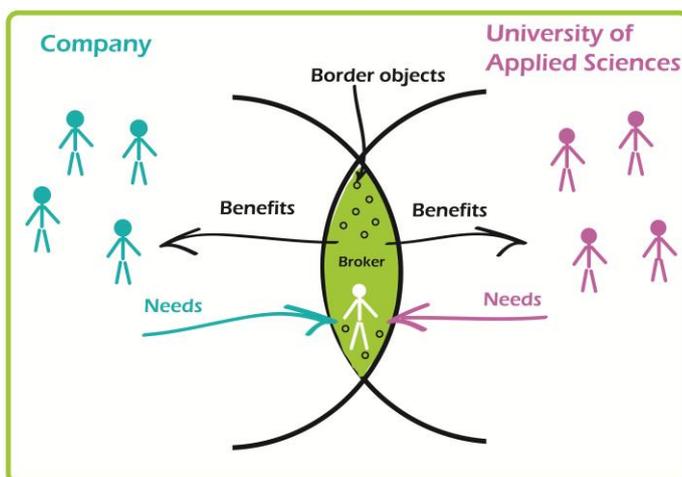
In the first phase (see Progressing, Figure 4 above), the project group was familiarized with the methods and tools of service design, and they learnt to select suitable ones for different cases. In addition, the project group discussed the different ways to integrate the service development cases into UAS studies. Each UAS applied different practices, but the challenges were the same: How to integrate teaching and research, and how to ensure the quality of student work?

Second phase (see Learning by doing, Figure 4 above) was about addressing real-world service-related problems in teams of UAS staff, UAS students and company representatives. The focus was on increasing the competitiveness of the participating companies while at the same time learning about the methods and tools of service design.

Third phase (see Reflecting, Figure 4 above) gathered all the lessons learnt in the previous phases. Experiences were discussed with the focus on detected best practices and possible failures. The lessons learnt were taken aboard when moving on to the second iterative round. Within the PALI project, the second round means two more practical service development cases into which the increased competence will be applied.

To tackle the challenges of integrating teaching and research, and of ensuring the quality of student work, a Broaker model (see Figure 5 below) was created. According to the model, each UAS has a service design expert who acts as a broker between the UAS and SMEs. The broker understands both perspectives and thus, is able to generate projects that benefit both parties. From the viewpoint of the UAS, the role of the broker is to change service opportunities into actual services. These changes from opportunities to services may be called border objects. The model has not been adopted into practice as of yet.

Figure 6 Broker model for integrating teaching and research



The further project activities include producing a practical service design how-to guidebook for SMEs, intermediary umbrella organizations and UASs, and the outlining of a service design clinic, or an interactive, hands-on platform for knowledge transfer between UASs and SMEs. The intensive workshops worked as a prototype for the forthcoming business clinic. In addition, a national seminar will be organized in order to share the experiences and lessons learnt. As for the research at hand, the next phases include extending the research framework, analysing the case study materials, and finally assessing the validity and transferability of the RDI that has been undertaken during the PALI project.

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Co-created tools for teaching, learning and designing services in Colombia

Facilitating interdisciplinary learning in service design innovation

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Abstract

This paper resumes an on-going research project that is developing and prototyping an improvement on the learning experience for students in design innovation. For this project the key components of the Innovation Workshop's learning experience have been considered, evaluated and adjusted. Among these elements are the tools that have been adapted to facilitate the design and learning process of multidisciplinary teams, composed by designers and non-designers, which work collaboratively through a semester-long project with a company brief. This paper presents and describes three tools from successful student's experiences, why they have been chosen, and how they have been adapted to be integrated into the set of resources for the *Innovation Workshop* learning experience.

KEYWORDS: Innovation workshop, Human-centred innovation, design thinking, service design, service design tools, service design in Colombia.

1. Introduction

Background and origins. In recent decades both the Design discipline and its practice have experienced a great transformation all over the world; the connection between Design, services, value and innovation, by means of interdisciplinary and human centred approaches, have redefined the way in which Design is nowadays understood, valued and implemented, and Colombia has been no exception to this change. However, as it is an ongoing global transition, the effects of this mindset change are just being recognized in Colombia.

With the potential that Service Design has now in developing countries, it is not only important to educate Design professionals in this approach, but also to share this way of thinking with other disciplines. In this attempt it is important to consider that the way in which design methodology is taught has to be adapted, designed and documented for people with different academic backgrounds, in order to make this process explicit, transparent, appropriable and replicable.

Innovation workshop. Working in the context of a multidisciplinary effort by the schools of Design and Management of Los Andes University in Bogota – Colombia, a semester-long course for undergraduate programs was created three years ago. The course objectives are: to develop a concise methodology for conceiving and executing innovation projects, to transfer this methodology to students (both designers and non designers), and to engage company managers throughout this experience.

The course, named *Innovation Workshop*, is offered as a fourth year studio for the design program and as an elective for the entrepreneurship minor offered by the Management school. This structure allows the course to integrate design students with students from all the programs offered by the university, and in this way develop the projects from multidisciplinary groups. During the course the teams, with the coaching of the teachers and the information given companies, apply the methodology of the class, based on the paper: “Innovation as a Learning Process: Embedding Design Thinking” (Beckman & Barry, 2007) for the development of projects that can be either products, services or product/service challenges.

Although during the years that the course have been implemented several adjustments have been made to the contents, the activities and resources; today, more than 3 years with the course, around 54 projects and 228 students from different backgrounds, it is possible to reflect about the experience. Consequently, with the objective of documenting, codifying and improving the learning experience and practice of the course, an ongoing research is being conducted.

This paper presents preliminary results of the research related to the experience of the students around the following questions: how students (designers and not designers) understand service design concepts and methodologies and incorporate them along the different phases of their projects? How to make use of good practices of students and build on their adaptations? What are the barriers that students face when trying to understand and design a service? If any, how can we help students overcome this barriers?

2. Methodology

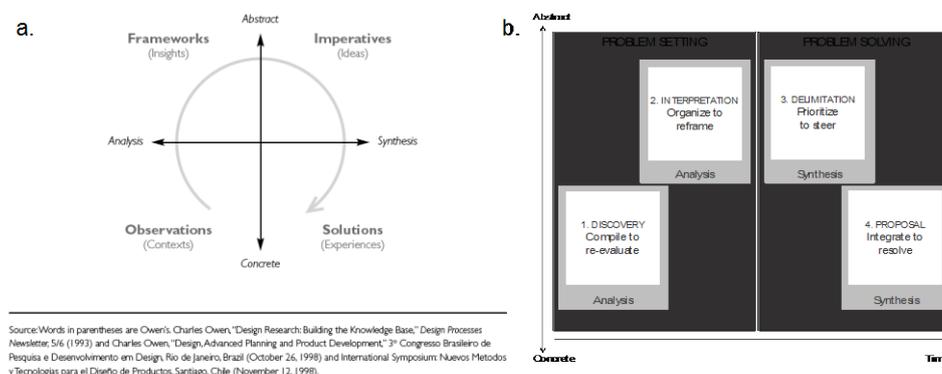
Since the students' and professors' engagement and participation determine the experience, the evolution of the methodology and the materials developed by both professors and students were examined, with a particular emphasis on tools and resources related to the research questions. Extensive interviews and work sessions were performed with former and actual students, conducted by researchers who were not involved in the original workshop sessions. Emerging patterns about service design concepts, tools, and methodologies were identified and analyzed. Tools from successful experiences were assessed, adjusted and redesigned to be tested during the second part of the research.

3. Tools for service design in the Innovation Workshop learning experience

From this research, the components of the Innovation's workshop learning experience were identified as: human factor elements (teamwork, coaching of the teachers and interaction with companies), methodologies, concepts and tools.

- *Human factor* is the main and most important component. It is divided in teamwork, coaching by professors and interaction of students and professors with companies. *Human factor* is related to the complex experience of working collaboratively with people of different backgrounds to develop a project, thus it was considered as one of the most important indicators for the development and co-creation of the tools presented below.

- *Methodology* is the compass for the learning process and the project development process. For the Innovation workshop the model presented by Beckman & Barry (Figure 1a) has been adjusted (Figure 1b), the phases have been re-named and adapted to the needs of the students, the companies they work with, and the local context in which projects are developed. The graphical representation of the model has been changed as it was found that is clearer for the participants to understand the methodology in relation to its development over time.



a. Beckman & Barry Innovation Model

b. Innovation Workshop model

- *Concepts* are the abstract elements of the methodology that frame and support the process. From the research within multidisciplinary teams, one of the main barriers to assimilate design thinking and service design approaches was the lack of a shared language and comprehension of basic concepts between designers and non-designers. Therefore, it was fundamental that the resources enabled the comprehension and integration of concepts such as *stakeholder*, *touch-point* or *front-stage* through the project, as this integration builds a common ground for a fluent communication

- *Tools* are the component that articulates the concepts' implementation throughout the methodology, and integrates all the components of the learning experience. Tools (guides, to do lists or printed forms, among others) have shown to be a key element of the learning experience as they support designers' practices by making them tangible and communicable, plus they guide non-designers and firms throughout the project phases by making assignments feasible.

When assessing the development of the projects in teams of students from design and other fields, complications emerged frequently when the groups were moving from one phase to the other, especially in those paths from concrete experience observation to abstract conceptualization (from discovery to interpretation in our model) and from abstract conceptualization to abstract conceptualization (Interpretation to delimitation in our model). These were the moments where non-designers were more likely to feel lost and disengage from the group, often because they were unfamiliar on how to conceptualize and organize qualitative information with graphical analysis such as profiles, journeys or blueprints; or because they didn't feel comfortable with setting the problem in an intangible connection path (from insights to benefits, to value proposition, before defining the solution attributes).

It was also found that both designers and non-designers tended to use the tools presented in *This is Service Design Thinking* (Stickdorn & Schneider, 2011), *IDEO HCD toolkit*, *IDEO Method Cards*, *Bootcamp Bootleg* (Stanford University, 2011), and those from their previous experiences, in an unconnected manner within and between the different phases, leading to confusion and frustration when trying to make sense of loads of, sometimes inutile, information.

On the other hand, successful initiatives of groups coping with these complications were identified and analyzed. There were communication strategies related to the human factor mentioned before, such as teams that defined clear roles and activities based on each participant's abilities; but there were also tools designed or adapted by the group to overcome their difficulties.

Tools appear to be a manner to codify, share and transfer practices; therefore tools from the state of the art can evolve and be adapted to specific environments. The following parts describes three tools from successful student's experiences, why they have been chosen, and

how they have been adapted to be integrated into the set of resources for the *Innovation Workshop* learning experience.

All the tools presented below have been adjusted and translated into an instruction-template format. *Instructions* convey considerations related to: objectives, outcomes, participants, key concepts and implementation activities. Instructions have been thought to be shared grounds for the team to discuss and take into account basic elements that can help them overcome the barriers. *Templates* were designed to facilitate dealing with the organization and visualization of the information (specially for non designers), and to focus the designers' attention on the content rather than on the layout's design.

3.1 Service Experience

Origins: A team had to understand how was the experience of an Asian restaurant in Colombia, since the restaurant wanted to develop a more sustainable utensil to eat without affecting the experience. After gathering information from different sources they decided to place images on a piece of paper and write down what elements composed every image, as a step between gathering and analyzing the information. With this tool the team was able identify differences between the way waiters attend the customers, the way chopsticks were on the table from the beginning or not, the way forks and spoons were offered depending on the waiters perception of the customer and the way customers changed depending on the location of the restaurant.

Appraisal: Although the results of the tool were relevant, in order to replicate the group's experience with other projects, it was necessary to codify this process in a template that could assist data sorting and analyzing. Additionally, tools such as this one that includes large amounts of information tend to be complicated when the team faces the analysis stage, therefore requesting the integration of, at least basic, guidelines.

What has been added? The instruction format (figure 2) integrates detailed descriptions of the tool, the skills, key concepts and references. However, the main addition was to include in the instruction format suggestions on the actions that have to be done before, during and particularly after gathering the information and filling the templates. These instructions are meant to be a guide that integrates the most common tips and feedback given by the professors in the coaching sessions related to these activities. The template (figure 3) includes definitions and questions to trigger the discussion when filling in the information.

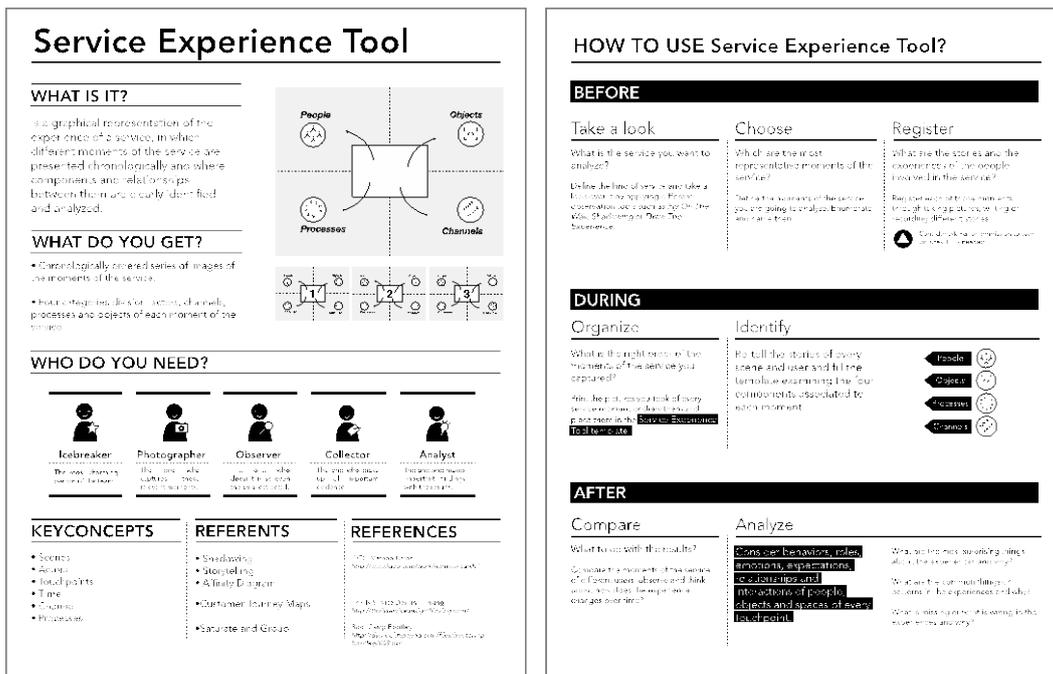


Figure 2: Service Experience Tool instructions

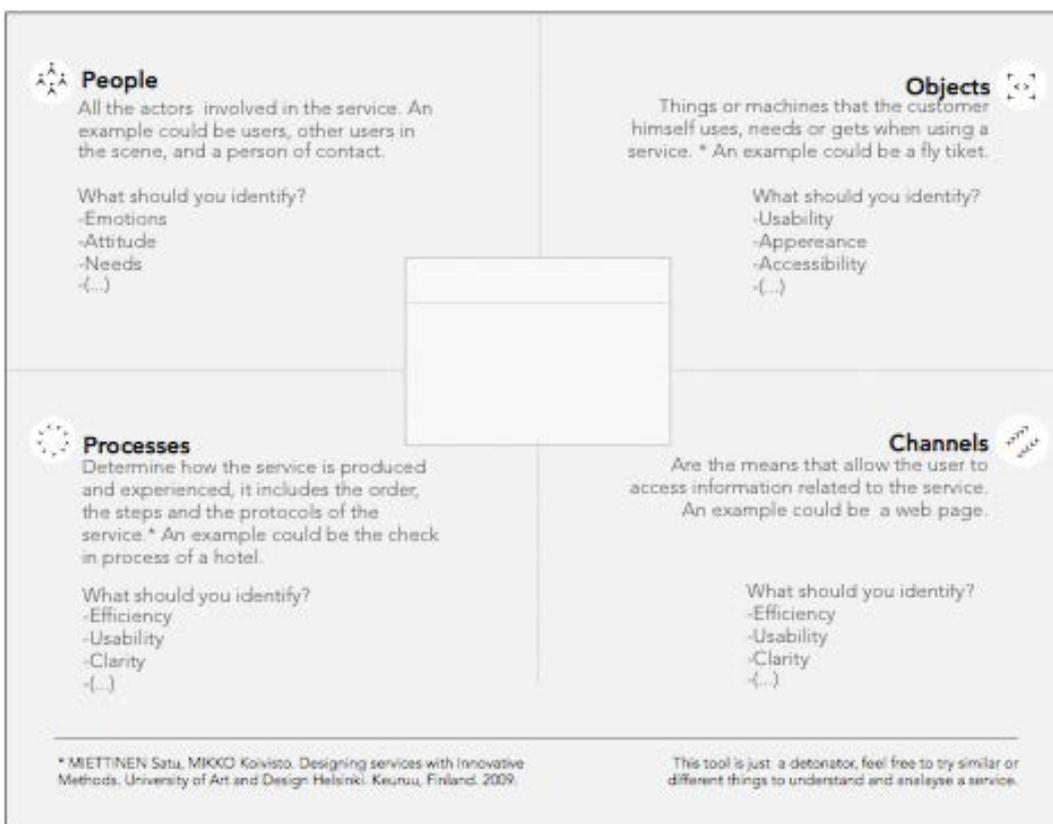


Figure 3: Service Experience Tool Template (adjusted from the A4 original size).

3.2. Behind the service

Origins: When evaluating the ways teams dealt with the problem of trying to decompose and analyze service related projects, it was found that very often they tend to centre their attention on the user's experience and find it complicated to relate this experience with the provider's perspective. Blueprinting was used for a general overview of the service but led to a rather superficial backstage understanding since the graphical piece integrates a lot of information that, again, was mostly focused on the user experience. In a project that was taking care of the lack of university services for the disabled community, a close assessment was made to the current university offerings, formal and informal, from all the stakeholders involved in the backstage of the service. This approach led to understand that there were several initiatives with the question on how to integrate the disabled community, with platforms and resources that were available but disjointed. Afterwards, it was understood that framing the attention on the backstage only could give a complementary perspective of the service offering that complements the user experience's perspective.

Appraisal: Blueprinting might be the tool that is more clearly related to service design, both for understanding and designing services. However, for groups of students unfamiliar with service design concepts it can be cumbersome, leading often to a simplification where only those elements occurring "on stage" are taken into consideration. With a close and focused look to backstage current activities insights, patterns and opportunities can be integrated to the observations of the user's service perspective.

What has been added? Detailed instructions (Figure 4) aim to lead the team to be aware of the key elements and define a starting point before initiating their activities. The template (figure 5) seeks to induce the capture of observations and notes related to the backstage actors and relations in a systematic fashion.

This tool is meant to be used together with the service experience one for the process of gathering, organizing and analyzing the information of the problem setting phases of the model; although they are also suggested as a resource to define and communicate design proposals.

Behind the Service Tool

WHAT IS IT?
It is a graphical organization of the components of the backstage of a service, in which different backstage scenes are analyzed having in mind the system support, the management support and the physical support.

WHAT DO YOU GET?

- An organized list of the backstage of the service components.
- Clear relations between the backstage and the frontstage of the service.
- A list of problems and successful situations of the service.

WHO DO YOU NEED?



Photographer
The one who observes the service.



Observer
The one who directs the service.



Collector
The one who collects the information.



Analyst
The one who makes the backstage.

KEYCONCEPTS

- Backstage
- Line of visibility
- Actions
- Touchpoints
- Processes

REFERENTS

- Activity analysis
- Affinity Diagram
- Shadowing
- Service Safety
- Contextual interviews

REFERENCES

2002. <http://www.ericsson.com/ericsson/ericsson/ericsson/>

2003. <http://www.designthinking.com/>

HOW TO USE Behind the Service?

BEFORE

Take a look

What is the backstage of the service you want to analyze?
Define the kind of service and take a look over its backstage by applying different observation tools such as Fly On The Wall or Shadowing.

A A good recommendation will consist in organizing the backstage with the Service Backstage Tool.

Choose

Which are the most representative moments of the backstage of the service?
Define the moments of the backstage of the service you are going to analyze. Prioritize and name them.

Register

What are the process, the resources, the activities and the experiences of the people involved in the backstage of the service?
Register each of those moments through using photos, writing or recording different stories or processes. Prioritize these activities in different moments during the day and during the week.

DURING

Classify

In Behind a Service template, identify and classify the information obtained on the backstage in:

System Support

Management Support

Physical Support

Organize

Organize service backstage moments chronologically.

AFTER

Compare

What to do with the results?
Compare the results of different moments during the day and during the week.
If you analyzed the backstage before, compare those results with these results.

Analyze

How does the backstage influence the frontstage and vice versa?
What problems are related?
What successful situations are related?

In what moment is the service provider failing?
What is missing in the service?
What is the most surprising thing about the backstage of the service?

Figure 4: Behind the Service Tool instructions

The scene number is _____

The scene title is _____

| System Support Technology, Systems and Know How | Management Support Managers and Supervisors | Physical Support Support functions and Support Persons |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>System support is composed of investments that the service organisation has made in infrastructure, technology and system know-how. Buildings, offices vehicles, machines, tools and template documents are examples of system support*</p> | <p>Managers and supervisors are responsible for supporting and encouraging the contact personnel to perform well. Management creates the service organisations values working methods and prevalent service culture.*</p> | <p>Contact persons are often dependent on support persons' work-input when serving customers. For example, without the support people's contribution airplanes would not be cleaned, passengers on the flight would not be served any meals, and the flight crew would not be trained for their work tasks.*</p> |

* MIETTINEN Sari, MIKKO Kolvito. Designing services with Innovative Methods. University of Art and Design Helsinki. Keuruu, Finland. 2009.

This tool is just a detonator, feel free to try similar or different things to understand and analyse a service.

Figure 5: Behind the Service Tool Template (adjusted from the A4 original size).

3.3. Needs, benefits and opportunities

Origins: A group of students was working with small-retail food stores in low-income neighbourhoods. The task was to find a way to use the relationship between the tradesman and the people from the community as a channel to inform about nutrition and healthy eating habits. After gathering information of the community and defining profiles such as “the spoiled”, “the piggy”, “the pigeon” and “the tetrapack”, the group used the question ¿what are their particular needs? to start the conceptualizing process. They found that “the spoiled” needed to be coddled because he found in the tradesman more a friend than merchant; “the piggy” needed to be surprised because this was the case of little kids with few coins left from a big purchase that their mothers did; “the tetrapack” needed to be recognized because he knows how to buy nutritive groceries, and “the pigeon” needed access to low prices, because he prefers to fly instead of paying a high price. From these benefits the students defined that the proposal had to include a personal treatment, a surprise factor, recognition, and low prices of the products.

Appraisal: As it was mentioned before, groups find hard to handle the transition between abstract stages of the model (from interpretation to delimitation). For students unfamiliar with qualitative processes these stages are complicated, and when the group lacks sufficient communication skills these are the points in which they tend to separate. With the connection between profiles, needs, benefits and opportunities being visible, teams are given a means to organize and discuss their findings.

What has been added? Starting from the students experience mentioned above, the instructions of this tool (Figure 6) guide the students on how to extract from the analysis phase needs, benefits, and opportunities in a systematic way. The template (Figure 7) is thought to facilitate the information capture. From this point brainstorming sessions can be conducted to start defining ideas on how the service provider can satisfy the needs, deliver the benefits, or take advantage of the opportunities related to each actor or profile.

Needs, Benefits and Opportunities Tool

WHAT IS IT?
Is a graphical representation of the information found so far, based on the user profiles or on those actors involved in the service.

WHAT DO YOU GET?

- A list of the opportunities to propose.
- Comparing needs and benefits of the stakeholders involved in the service.
- Related needs and benefits of the stakeholders involved in the service.

WHO DO YOU NEED?



Observer
The user who doesn't see and doesn't feel.



Collector
The user who acts as an important witness.



Analyst
The one who makes important things visible to others.

KEYCONCEPTS

- Value proposition
- Needs
- Benefits
- Opportunities
- Profiles

REFERENTS

- Personas
- Why How Laddering, Point of view matrix.

REFERENCES

Design for Innovation of Dan Saffer

Real Time Strategy: How to Achieve Superior Performance in a Hypercompetitive World

HOW TO USE Needs, Benefits and Opportunities?

BEFORE

Take a look

What is the service you want to analyse?

Tip: Start by considering one element of your organization. The findings are the Service Experience tool findings with no link to Service Tool.

Define

What are the actors that are involved in the service that you would like to analyse?

Choose the actors of the service from a previous investigation.

What are the profiles of the service users?

Deepen

What is the relationship of the actors with the service?

Take a look if the actor is satisfied with the service, what are the gaps related to the service of these actors?

Investigate each of these questions if all you do not have the sheet.

DURING

Choose

Choose if you are going to apply this tool with profiles, personas or stakeholders of the service.

Complete

Fill in the boxes of the **Needs, Benefits and Opportunities tool template** with each actor asking about his or her:

- Needs
- Benefits
- Opportunities

AFTER

Compare

What to do with the results?

Compare the results of the needs, the benefits and the opportunities of the different actors or the user profiles.

What needs and benefits of the stakeholders involved in the service are competing or related?

How can you combine different needs, benefits and opportunities?

Analyze

Consider what is the most appropriate part of the service where you can participate considering the needs, and the benefits of the pursuing the stakeholders of the service.

What is the most important opportunity?

What is the most important benefit?

How can you combine different need, benefits or opportunities?

Having in mind the specific of the service which is the most important opportunity?

Figure 6: Needs, benefits and opportunities instructions

1. User's Profiles
These are the users profiles that resulted from the Service Experience Tool.

This part can also be filled with the service actors identified in Service Experience tool or people belonging to management support or physical support identified in Behind the scenes tool. (service actors)

2. Needs
These are user's profiles or service actors' unconformities, concerns, objectifs and also the desire to satisfy them.

3. Benefits
These are the true profits or advantages pursued by users profiles or service actors.

These should be reflected in the final proposal.

4. Opportunities
These are identified situations or service moments that are more conducive to propose.

| | | | |
|--|--|--|--|
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| | | | |
| | | | |
| | | | |

This tool is just a detonator, feel free to try similar or different things to understand and analyse a service.

Figure 7 Needs, benefits and opportunities template

4 DISCUSSION

A multidisciplinary course dealing with User Centred Innovation, and Service Design is a complex system where each component alters the outcome of the learning experience. As it was mentioned in the components section, the human factor regarding both the interaction between professors and students (coaching), and the interactions that occur within groups through the project, is a central element of the learning experience. Supporting these interactions with tools derived from students' successful practices appears to be a way to facilitate those moments where groups frequently face difficulties.

Service design and user centred methodologies are extensive in qualitative data gathering, sorting, and visualization; and for these activities several tools are available in the state of the art literature. However, there is still room for adaptation of these tools regarding the particularities of a learning environment where not all designers are able to communicate and instruct on their practices to non-designers, and where non-designers are faced with a different way of dealing with projects. Having said so, it is clear that the tools presented in this paper don't intend to be "new tools"; they are rather a complement to widely known ones, such as story boards, blueprints, profiles or probes, and are proposed to be in one hand a means to elicit designers' skills, and on the other hand to provide resources and frameworks to non-designers, in the process of understanding, analysing and communicating the information gathered and processed as a group along the project.

4. Conclusions

This project has shown early results in general and specific aspects. Tools from the student's practices have shown that the attempt to make the process explicit for non-designers is a need when working in multidisciplinary groups.

The three tools with the instruction-template format described in this paper are currently being tested, to be integrated as part of the resources of the course. Although this is an ongoing project, preliminary results show that our tools can be useful resources that can help to close the gap between designers' language, practice and activities within multidisciplinary groups. The overall research project about the *Innovation workshop* learning experience presents evidence of the positive effects of an interdisciplinary approach to innovation; while designers are discovering the multiple applications that their knowledge and skills have in organizations, non-designers are learning the processes and disciplines of creativity as they seek to integrate innovation into their activities. These tools, their following versions and adaptations aim to lead designers to reflect and communicate better their practices, and to bring non-designers closer to design concepts, methodologies and procedures.

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A Service Walkthrough in Astrid Lindgren's Footsteps

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Abstract

How can service prototypes be created and evaluated? This paper describes how methods like bodystorming and experience prototyping can be used in combination with pluralistic walkthrough in an evaluation method we call 'service walkthrough'. We put the method to test in the development of augmented tourism services at the author Astrid Lindgren's childhood home. After initial design work, a mock-up and roleplay of a treasure hunt in the garden of the childhood home was made. It was evaluated using the service walkthrough method. The most important lesson learned was that a service walkthrough can be used to evaluate service prototypes and that it reveals information about practical as well as experiential issues for users.

KEYWORDS: service prototyping, evaluation, bodystorming, experience prototyping, pluralistic usability walkthrough, service walkthrough

Introduction

How service prototypes can be created and evaluated is one important area of research within service design. Prototyping services is different from prototyping physical products (e.g. Blomkvist & Holmlid, 2010; Parker, 2009; Nesta & thinkpublic, 2011, Holmlid & Evenson, 2007) and an area that requires more research (Ostrom, et al., 2010). One aspect of our research agenda is to explore what a service prototype might be, and how service prototypes can be evaluated. To understand service experiences, designers need to capture both physical and immaterial qualities in service representations. In addition, a sequence of interactions between a service provider and customer, mediated by different artefacts, need to be taken into account. The challenge of doing this lies at the heart of the service prototyping challenge, and to make realistic predictions based on service prototypes, designers arguably need to understand services in an embodied and holistic way that emphasise empathy for the experience of the intended customers and other stakeholders in the service.

In the following section a background to prototyping in service design is described. Following that, a case study of using what we have called a service walkthrough as a method for evaluating service design prototypes is presented. Finally some lessons learned are given and discussed.

Background

When dealing with service that can be described or understood as a journey, with a clear temporal and sequential nature, there are some interesting ways to approach prototyping. For this type of service we have seen much knowledge about visualisations generated within service design (Segelström, 2010; Parker & Heapy, 2006), and representing service as journeys is one of the ways in which service designers' work distinguishes itself (Kimbell; 2009). How these journeys can be prototyped and tested, as whole service experiences, is an area that still requires further investigation (Blomkvist & Holmlid, 2010). A number of approaches that increase designers' ability to empathise with target groups have however been suggested in other design fields.

Prototypes in service design can focus on one touchpoint or service moment, or it can describe in detail what kind of information should flow through it, and what behaviours or interactions should occur at various service moments. The fidelity of prototypes can range from rough sketches to prototypes carried out with the actual customers in the actual implementation context (Blomkvist, 2011). In this paper the focus is on the level of a walkthrough of the service.

A service walkthrough is performed with a physical representation of how a service unfolds over time. It allows designers to explore, evaluate, and communicate service concepts in an embodied and holistic way. By embodied we mean that actual people take part in the service representation and understand the service by being physically and emotionally present. By holistic we mean that the service parts, the service moments and touchpoints – when understood and experienced as a whole sequence – will reveal something about the service that cannot be accessed through the individual service constituents. A service walkthrough should thus be understood as a way of increasing empathy with the potential customer group.

A number of techniques with a similar purpose have been suggested before. The techniques Bodystorming and Experience Prototyping advocate embodied prototyping that allow designers to get an understanding of experiences. These techniques have usually not been used to understand whole service experiences, but rather focus on single touchpoints. Bodystorming as a technique was termed by Burns et al. (1994), as a part of their Informance design approach. Informance is an approach quite similar to service walkthroughs where scenarios are acted out using low fidelity prototypes as props. The idea is that these sessions open up “informed dialogues” (p. 119) between designers and audiences (Burns et al., 1994). Bodystorming and its application in Ubiquitous Computing have been more thoroughly explored and reconfigured by Oulasvirta, Kurvinen, & Kankainen (2003). Bodystorming is a contextual way of exploring and understanding design problems. A session is carried out by gathering a group of people that explore a number of design problems related to a specific situation. The problems should be based on user research and the location in which the problem is explored should in some way resemble the intended use context to provide useful and reliable results (Oulasvirta, Kurvinen, & Kankainen, 2003).

Experience prototyping is an approach that attempts to understand the experience of interacting with an artefact, system, or a service (Buchenau & Fulton Suri, 2000). This approach is similar to bodystorming in that it tries to replicate an existing situation or construct a new one, in which participants can understand, in an embodied way, what it feels like to interact with something. Buchenau & Fulton Suri (2000) also showed how information about goals and needs were introduced to the participants of the prototype to produce certain behaviours and test certain aspects of the experience. This requires a measure of roleplaying from the participants, something that is not always experienced as easy or natural (Oulasvirta, Kurvinen, & Kankainen, 2003; Brandt & Grunnet, 2000). Roleplaying, drama and design games are popular techniques in design used to explore interactions and facilitate communication between stakeholders (see e.g. Brandt & Grunnet (2000)). A key in roleplaying situations is the props and setting, affecting the possibility for the participants to understand the situation and make relevant choices and actions.

Another technique with similar objectives and motives is pluralistic walkthrough (Bias, 1994). The technique was initially intended for usability inspections of user interfaces. This kind of walkthrough includes three types of participants: representative users, developers, and human factors professionals. Each participant takes the role of a user. The walkthrough starts with a brief overview followed by all participants going through the interface, represented with hard copy scenarios, and writing down their actions. After each scenario the participants have a semi-formalised discussion. A session administrator facilitates and moderates the session to keep users' willingness to comment the actions and avoiding developers biasing users.

The common theme in these techniques is that they are all concerned with empathy for target user or customer groups, and how a design contributes to an experience. In the case of bodystorming this is achieved by going through the service in an embodied way, and experience prototyping also increases the understanding of what kinds of experiences can be associated with interactive elements. In the case of pluralistic walkthrough, empathy is increased by including potential users together with the developers and human factors professionals, who are asked to put themselves in the shoes of the users. According to Bias (1994) this was a way of increasing "inspector empathy" (p. 64). In addition, in the case of bodystorming the situated experience is emphasised – only by exploring prototypes in contexts that resemble the intended implementation context can we understand the end-users or customers. This is an important aspect of service prototyping as well, since a service experience cannot be separated from its location and contextual factors (Bitner, 1992).

We suggest that in service prototyping, a combination of these three techniques, where the whole service is walked through using "props" and "real people", is a useful approach. In the case described below we will use an instance of a service walkthrough technique with props in the form of mock-ups of all the touchpoints that were considered meaningful for the prototyped service.

The Case of Astrid Lindgren's Näs

The case is built on the development of augmented tourism services at the author Astrid Lindgren's childhood home. The term 'augmented' refers to 'augmented reality' (AR), which we explore in the context of tourism services. We use smartphones that allow us to create mobile AR-applications. Such applications "superimpose virtual information over the real world (as seen through the camera and display of the phone)" (Nilsson, 2010, p. 1). As a start participatory design

workshops were held where concept ideas were developed. Personas were created and bodystorming sessions were held, after which detailed storyboards for a treasure hunt was developed. Based on this work, props for all touchpoints and a storyboard for the role-play of a treasure hunt in the garden of childhood home were created (Figure 1).



Figure 1 Some of the props for the service walkthrough.

The Pluralistic Walkthrough Adapted to Service Design

This section of the paper describes how we performed the pluralistic walkthrough, what kind of results it provided, and a validation of the methodology.

Participants

One of our designers facilitated the walkthrough together with two assistants. There were also one human factors specialist, two developers and two user participants. The user participants were married and had two children together (2 and 5 years old).

Procedure

The facilitator and the two assistants met before the workshop to set up all the props in a physical environment, the garden outside our offices, that was similar to the garden outside Astrid Lindgren's childhood home Näs (Figure 2). Key places were identified according to the spatial relations between important places in the garden of Näs. The distances between places were not completely correct, but the overall positions of the important places were represented in our mock-up service walkthrough.



Figure 2. Figuring out what should happen during the walkthrough.

The walkthrough started when all props were set up. The facilitator then introduced the participants to the project. He asked them to fill in a screener questionnaire to gather general information about them (age, gender, children, education, experience with mobile technology etc.). Permission to record the session on video was also asked for and granted.

The participants were then given printed instructions that explained the scenario they were to go through, with all the important places, objects and buildings to keep in mind during the walkthrough. They also read the introduction to the treasure hunt, as they would have done in the reception of Astrid Lindgren's Näs. They were given the treasure map and a mock-up of a mobile phone, as they would have received it in the reception. The mock-up of the phone was made in transparent plastic and you could slide panels into it. Transparent panels were used to represent objects in the augmented reality world, and white paper panels were used to represent application screens.

During the service walkthrough the facilitator introduced the participants to the steps that were to be performed in the treasure hunt. He tried to get their comments and opinions, managed the session and made sure it progressed. The human factors specialist managed a detailed description of where to present the participants with what props, including what panels to insert into the mobile phone mock-up. One assistant kept track of all props and made sure the human factors specialist had the right props ready at the right time and the right place. The other assistant recorded the session on video.

The participants walked through the treasure hunt step by step. In the original pluralistic walkthrough method it is specified that the first to execute the steps always should be the users, followed by the developers, and finally the human factors specialist. In this case, the human factors specialist also managed the props, and this made us divert slightly from the specified method.

After each step of the treasure hunt, a short briefing was performed with each participant individually in order to investigate ideas, comments, problems and misunderstandings. Users were also encouraged to explain during the session why they took certain decisions or behaved in certain ways. When everybody had completed a step, a group discussion was held to highlight problems, raise criticism, and suggest improvements. At this stage it was important that the users got their say before anyone else. A cooperative atmosphere was essential at this stage, and the developers and designers were not allowed to become defensive. In order not to miss details of importance the participants were asked to take

notes during their own performance of the steps. These notes were also used in this group discussion.

A final group discussion was held when all steps had been performed in the walkthrough of the treasure hunt, and concluding evaluative questionnaire was handed out. The walkthrough was over after one hour and forty-five minutes, and the facilitator and the assistants then thanked the participants and removed all the props that had been placed in the garden.

Results

The main results of the service walkthrough were related to a set of different areas.

There were several occasions during the treasure hunt, where users were unclear about what they were supposed to do. This pointed towards the design of the touchpoints of the treasure hunt, which needed redesign, in terms of content as well as form. Moreover, there was a clear need to develop better posters and information for the guides at the reception, to better explain the steps and sequences and to manage the expectations and structure of the treasure hunt.

As the treasure hunt is an immersive self service to learn about Astrid Lindgren, there is a distribution of co-creation of the experience that leans towards the visitor. In this case, the managing the complexity of co-creation, with a map, a cell-phone, children and parents, was perceived as difficult to the participants.

During the treasure hunt we were made aware that better use of media such as audio and video might be useful in addition to text. In turn this gave us guidance to more clearly specify content development.

There was also discovered some needs to redesign the technological user interface.

Validation

In order to validate the procedure of the method, we later asked the participants in the walkthrough a few questions about their experiences. The questions included what they thought about the test in general, if they had any issues with the test, and what they got out of participating.

One of the developers stated:

Actually we saw a lot of problems with the interface when he took us on the little test tour. Made us think about how to solve different issues that we had not really thought about before.

The other developer agreed that they found mistakes in the design during the pluralistic walkthrough. They also got suggestions from the other participants on how to include audio. The walkthrough contributed with things to add (especially sound) to make people more immersed in the treasure hunt.

The walkthrough was also experienced as slow compared to what the developers wanted to do on the mobile phone. Since all transparencies for the mock-up had to be managed the process became sluggish and participants could get the concept, but not the experience. One of the developers suggested that video and audio could be used during the pluralistic walkthrough to increase the understanding of what the final experience would be.

The user participants in the walkthrough expressed similar issues. One of them said:

It was rather fun to do something practical, but I was surprised that it wasn't a real mobile phone I was testing with. I think it would have been a different effect if you had seen what happens on the phone.

Another problem experienced by one of the user participants was that you overheard what the others were talking about. This may have influenced the ideas that came up.

For the user participants the most rewarding part was to learn that you could augment the real world using a mobile phone, and that a treasure hunt would be a really fun game for both children and adults.

Lessons learned

The service walkthrough gave us feedback on the design that was important for the project. Having the developers participate in the walkthrough gave them first-hand understanding of the experience they should contribute to. This was critical for the future development of the service, including the required technology.

One of our designers facilitated the walkthrough together with two assistants. The amount of panels that was needed for the AR-application required order of all props and very clear descriptions of the steps involved. A service without these detailed interaction steps would perhaps not require two assistants.

The walkthrough was conducted in a location similar to the real servicescape. It was important to represent the spatial relations of the important places for the service. That is, the fidelity of the servicescape was kept, while validity was not.

The results of the walkthrough prompted us to avoid text and make better use of video and audio. This contributed to a more clear specification for content production. Here we see how the service walkthrough can tie the service design activities to other design domains like media design and interaction design.

We could also see that it was difficult to manage both phone and map, while also keeping track of your kids. This is an example of how a service walkthrough can help designers feel empathy for the users and contextualize their design decisions in relation to the physical, the social, and the technological context.

Overall we realised that there were several places in the treasure hunt where it was unclear what people were supposed to do, and this made us make many changes to printed media, video, audio and guide instructions.

We also noted some problems in the way in which we made the walkthrough. Despite having two assistants it was sluggish to manage all the props. This meant that participants got the concept, but not the experience. This means that the service walkthrough as we carried it out tested the logics behind all the steps of our treasure hunt, but it did not really convey how it would feel like to go through the gardens at Astrid Lindgren's Näs hunting for hidden treasures.

Discussion

Designers need to capture both physical and immaterial qualities in service representations to understand service experiences. They also need to take a sequence of mediated interactions between service provider and customer into account. To accomplish this in a service prototype is a challenge. We set out to find ways of evaluating service prototypes using what we call service walkthroughs. We found the inspiration for the method in bodystorming, experience prototyping, and pluralistic walkthrough. Combining methods like this seemed a viable way to make a contextual, experiential, and empathic evaluation of the proposed service design.

Bodystorming aims at opening up informed dialogues between designers and audiences. It provides a contextual way of exploring design problems since you conduct the session in the situation of use. This idea was brought into the service walkthrough evaluation method. We did however, not situate it at the real location, but used a similar location. From the results we collected it is not possible to say anything definite about the effects of not using the real location. However, in the setup we used, it seems not to have affected the participants of the walkthrough. Exploring these effects is an important area for future research.

Experience prototyping aims at getting designers to understand, in an embodied way, what it feels like to interact with something. This is also an important part of our service walkthrough. The pluralistic walkthrough also have the goal of including designers and developers in evaluation to give them inspector empathy (Bias, 1994). This method also gave us a protocol to follow for the evaluation.

All these methods require roleplaying from the participants and this does not always come naturally. This was also the case in our service walkthrough. Our props were not the real thing, and it was difficult to get the feel for how a customer journey would be experienced. Films and sound could perhaps be used in the walkthrough for this purpose. On the other hand we got feedback on sequencing and evidencing within the journey. The trade off between fidelity, media and evaluation results is also an interesting venue for future research.

Conclusions

This paper has described an evaluation of a service prototype where the ideas of bodystorming, experience prototyping and pluralistic walkthrough were combined in an evaluation technique we call service walkthrough. The bodystorming and the experience prototyping methods bring with them a focus on the context and experience of a customer journey, and the pluralistic walkthrough method gave us a protocol to follow. We observed that the complexity of the props can impede on the evaluation of the experiential aspects, while still giving good feedback on the logics of the steps involved in the journey through a service.

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Embedding service design: the long and the short of it.

Developing an organisation's design capacity and capability to sustainably deliver services.

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Abstract

What are the factors affecting how service design methods and practices are embedded within an organisation? How can embedding of design methods be done sustainably, providing lasting benefits? Over a four-year period, the author observed and studied a large public sector organisation as it developed in-house service design capabilities and strove to embed design thinking and processes within its business culture and working practices. The conditions necessary to enable innovation to take place within an organisation are not so dissimilar to those observed for embedding design, and for enabling design to be used effectively in the development and delivery of services. As with any innovation, the introduction of the practice of service design within an organisation requires a change in culture and behaviour: in this case, a shift in focus from the mechanics of delivery to include the experience of the customer. The in-house service designer is required to juggle long-term delivery of business strategy while creating short-term value to the business through project outcomes. A balance must be struck between the dissemination of design methods and processes within the organisation while keeping an eye on the long-term business strategy. The eventual goal being to effectively modify the organisational DNA of service delivery, where design methods are sustainably applied at various levels throughout the organisation.

KEYWORDS: service design, innovation, embedding, capability, sustainable

1. Introduction

What factors affect how service design methods and practices are embedded within an organisation, and how can it be done in a manner that is sustainable? That was the question posed in this study. There is little available research literature on what happens within an organisation when undergoing embedding of design capabilities and it was found during this study, that some of the most relevant research literature published on the topic was regarding innovation and innovating public sector services (Mulgan & Albury, 2003; Halvorsen et al, 2005; IDeA Knowledge, 2005; Taylor & Tofts, 2009). There are examples of professional cases where service designers have worked with clients to build design capabilities within an organisation and some of these were explored through interviews with Joe Heapy of Engine and Julia Schaeper at the NHS Institute for Innovation and Improvement.

Developing design processes and practices within an organisation requires a degree of innovation in the way it organises itself and goes about its daily business. It was found that the conditions necessary to allow innovation to take place within an organisation are very closely related to that for enabling design to be used effectively in the development and delivery of services.

The dissemination of design thinking and practice within an organisation requires a change in culture and behaviour: shifting the focus from the systems, processes and mechanics of delivery to take in the experience of the customer. The in-house service designer is required to juggle delivering input to the business strategy in the long-term, while also delivering value to the business through projects in short-term. For large organisations innovating change and new practices takes time and this can lead to frustration within the service design team: the long and short-term outcomes require balancing, and the resistance within staff to adopt change in working practices requires managing. This paper will discuss observations on the tensions created internally for a service design team, between the short and long-term goals, and will show how a balance has to be reached between delivering corporate strategy with running projects and internal workshops; where the designers can facilitate dissemination of design methods and processes. The eventual goal lies where personnel at various levels throughout the organisation are applying design methods, thus creating a change in business culture; essentially modifying their DNA of the service delivery.

Offering a critical reflection of the observations and findings generated over a four-year relationship with a public sector organisation this paper discusses the current insights generated from this study. The work presents findings on the conditions and practices that take place within an organisation during the process of embedding design thinking and methods to improve the design and delivery of services. The findings of this study have been generated from observations, critical engagement and reflections on the outcomes from a number of projects undertaken by the Product Design department at Glasgow School of Art with Skills Development Scotland, supported by interviews conducted with personnel within the organisation and external service design professionals.

2. An investigative journey

Skills Development Scotland (SDS) is a public sector organisation created in April 2008 amalgamating Careers Scotland, Scottish University for Industry (learndirect scotland) and the skills intervention arms of Scottish Enterprise and Highlands & Islands Enterprise. SDS aims to deliver a range of services that will help change the way people in Scotland learn, develop and utilise their skills, and to help businesses build their own capabilities to put these skills to productive use. Embedding design within SDS has been a journey involving support from the Glasgow School of Art (GSA) as well as service design consultancies, but most importantly through the development of an in-house Service Innovation Team within the Service Design and Innovation Directorate. This journey of investigation and innovation began when the organisation was still being conceived back in 2007 when the now Director of Service Design and Innovation, Jonathan Clark, approached the Product Design department at Glasgow School of Art to investigate using design methodology to improve customers experience. Thus began the journey from a commitment to the value of design and a conception of how it might be used, through the use of service design in different ways, to deliver a better understanding of how design should be implemented and what the organisation requires from it. The creation of the Service Design and Innovation Directorate within SDS reflected the commitment to implement a design approach from the outset.

Since 2008, the relationship between GSA and SDS has involved a number of student projects, internships and continuing professional development (CPD) (Bailey, 2010) and it is by critically reflecting on the outcomes of these engagements that has informed, developed and evolved our thinking on how design is embedded within an organisation. When considering which factors might affect how well the organisation embraced the introduction of design thinking and methods, some initial characteristics and behaviours were proposed to look for in the management and practices of the organisation. Initial hypotheses were proposed based on observations and from parallel examples of innovation in the public sector in published literature (Mulgan & Albury, 2003; Halvorsen et al, 2005; IDeA Knowledge, 2005; Taylor & Tofts, 2009). These hypotheses can be re-phrased in the following questions:

1. Is design readiness, the measure of how ready the organisation was to absorb design thinking principles and practices, sufficient to ensure successful embedding of design capabilities?
2. Is having an in-house 'design office' essential to disseminate design thinking and practices?
3. A change in business working practices and organisational behaviour are required to implement design thinking and methods. What mechanisms are required to facilitate dissemination of design practices throughout the organisation?

2.1 Design readiness

Absorptive capacity, as described by Halvorsen (2005, p.3), is the ability of an organisation to assimilate and make use of transferring technology. Halvorsen goes on to discuss how organisational absorptive capacity tends to develop cumulatively and that the process of innovation is likely to have begun before the introduction of the new technology and that the organisation will likely have had to procure, or develop, specialised skills in order to

integrate, or embed, the transferred technology. When discussing an organisation's capacity to absorb design thinking and methods during this study, we described it as *design readiness* - an organisation's capacity to absorb design thinking and methods. When trying to define design readiness the comparison with absorptive capacity was made; especially when design thinking and methods are substituted for technology. The cumulative absorptive effect described in Halvorsen's paper is necessary within an organisation to effectively disseminate service design thinking as similarly as if it were a new technology. In turn, this would hopefully lead to a change in business culture within the organisation by integrating design thinking and methods into their practices.

Initially it was considered that design readiness might be a measure of how successfully design could be embedded within the organisation but it became clear that, although there has to be an element of design readiness at the outset, this is not sufficient to determine whether design is embedded sustainably, enabling it to develop over time. Design readiness can be a measure of awareness and the potential to embed design, but design readiness also needs to become design practice and develop cumulatively within the organisation if it is to change the working behaviour in a sustainable manner.

To transform design readiness into qualities that can be actioned, design methods and practices must be disseminated throughout the working practices of the organisation. However there is a barrier here - *vocabulary*. It is insufficient to introduce design tools and methods without equipping people with a common vocabulary and with it the confidence to understand and communicate the use, process and outcomes of using these new tools. This finding parallels our experience at GSA when developing the teaching of service design within the product design programme. When the students were equipped with the necessary vocabulary to communicate their service design propositions effectively, they gained confidence and were able to discuss and defend their proposals. Similarly, the design tutors were better equipped to critique and assess the work and to provide feedback that was commonly understood.

Design readiness on its own is therefore not a sufficient measure of an organisations capacity to disseminate design thinking and embed design methods.

2.2 Dissemination of design thinking and processes

Innovation makes use of learning (Halvorsen et al, 2005, p.1) and it is through the application of teaching and learning methods in parallel with business practices that design thinking and methods can be more effectively disseminated throughout the organisation. It is often assumed that when consultants hand over a service design blueprint, or an in-house service design team delivers a set of tools, that the recipient staff will be able to apply them in a meaningful way, or that they can translate the service blueprint into appropriate project plans. It has been observed that the application of tools or methods is not enough without the appropriate design thinking that underpins them. Mulgan and Albury (2003) discussed how integration and implementation of an innovation often fails to achieve the anticipated results when delivered by an external agency, or that the understanding of user needs was not shared or clearly understood by the rest of the organisation attempting to implement the strategy. This can often be a source of frustration to the service designers (in-house and external) when delivering a service proposition and seeing the implementation stall. This source of resistance emphasises the importance of developing innovation and design capabilities within the organisation and not solely with the in-house service design team. Mulgan and Albury (2003, p23) go on to argue that generating new propositions and

processes for testing new ideas is generally not a weakness within the public sector, but that it occurs in the dissemination, replication and scaling-up of pilot projects and prototypes. Design for services has particular value here in being able to support the innovation process, providing the tools and methods to visualise strategies and develop service prototypes for user testing.

Within the context of this study, successful dissemination of service design capabilities was observed when in-house staff passed on their knowledge and processes through projects and workshops. By teaching others, they in-turn were reinforcing their own knowledge base and building confidence in applying design thinking, tools and methods in their everyday work practices. As workshops are usually designed to be hands-on, participants gain first-hand experience of the application of design thinking and in the tools and methods used in the process.

Another effective method of raising awareness was found to be through communicating design processes via communal spaces, posting work on walls of offices, etc, to encourage debate and discussion amongst colleagues. It seems appropriate, therefore, to utilise in-house service design teams to engage relevant staff members in workshops and projects to facilitate the dissemination and practice of design throughout the organisation.

2.3 Designing for behavioural and cultural change

Halvorsen (2005, p.10) observes that 'although institutions are the result of human activity, they are not necessarily products of conscious design.' This hints at an opportunity to develop in-house design capabilities able to apply design consciously to achieve targets set out in business strategies and, more importantly perhaps, influence the creation of the strategies themselves.

As discussed above in 2.2, behavioural change can be initiated through raising awareness of design practices and disseminating design tools and methods through projects and workshops. During the course of this study, further development of staff knowledge and learning was supported through Continuing Professional Development (CPD). It was observed that when members of staff shadowed projects, or were mentored through projects they were working on by tutors from the design school, that there was a greater confidence shown by staff in the use of service design terminology and in the communication of their thinking through design tools and methods. CPD also helped provide some of the theory underpinning what the service design staff were practicing and providing them with techniques and tools with which to run workshops of their own. The knowledge and skills developed during CPD courses were brought back into the organisation and passed on through collaborative working practices.

Although training and development of skills is valuable, it was also recognised that it would be easy for staff to revert back to previous behaviour patterns and business practices if they were not encouraged to continue applying these newly acquired design methods, or rewarded for doing so, by their line managers. This is one of the barriers cited as affecting innovation within public services (Mulgan & Albury, 2003; Halvorsen et al, 2005; IDeA Knowledge, 2005). Support has to come from all levels of management if a change in culture is to be achieved and sustained.

Design provides tools that encourage visualisation and communication of ideas as well as methods for clearly engaging with users and other staff members. However, due to the pressure service managers find themselves under dealing with the day-to-day delivery of services they often have little space to think about doing things differently (Mulgan &

Albury, 2003, p.31). It is important therefore that managers are afforded the time and space to develop an awareness and understanding of the use of design thinking and methods in order to support their staff. This will also enable managers to report efficiently to senior management and to directorate level on the processes used by their staff and the outcomes achieved; further disseminating appropriate design language and methods.

3. Reflections, propositions and conclusions

In section 2, initial assumptions were proposed and investigated for what might constitute the factors and conditions affecting how successfully design is embedded within an organisation. Through critical evaluation of the projects undertaken and reflection on the work being carried out by others within the organisation it became clear that there were more factors to be considered. The key findings from this study, as currently understood, are presented here. The three research questions posed earlier in section 2 have been developed into the following propositions for conditions required to disseminate and embed a design culture within a service organisation.

3.1 Design readiness

Recognising that design has a place and that it will be useful as part of a suite of business tools to improve delivery of services is a crucial step for an organisation. It requires vision and support from top-level management to recognise the need for a design approach, and to put in place the factors that will allow it to happen. Similar to the case for Skills Development Scotland the organisation needs to develop a business strategy that places innovation and design at its heart and putting in place in-house champions, the people that will make it happen, and recognising what external input is required to support the in-house personnel. In this case, SDS built innovation and design into the business model from the beginning, leading to the creation of an in-house service design and innovation team.

The NHS Institute for Innovation & Improvement whose purpose is 'to support the transformation of the NHS, through innovation, improvement and the adoption of best practice' promote design-led working practices. Their stated mission 'to enable and support the NHS system to transform health and healthcare for patients through a strategy of creating inventive, clinically-led and tested practical ideas which will build skills and capability for continuous improvement and support for leaders to drive real and lasting change'. Similarly to the set-up of SDS, the NHS Institute embodies a Design and Innovation team to support innovation. Early in their development the NHS Institute worked with IDEO to develop design-based, human-centred innovation work processes.

For both these organisations, design thinking has been at the forefront of their inception. Similarly, both organisations have specialist design teams to support the dissemination of design practices in the development of innovation in service delivery. For both cases there is directorate support for design readiness, but from interviews with Tony Coultas (SDS) and Julia Schaeper (NHS Institute) it could be seen to be difficult to keep design methods at the core of daily work practices where employees would prefer to return to their old familiar practice which may be more system-led than design-led. Also, even if the original intent was to have an integrated design team, it was noted that the design team could often feel apart from the rest of the organisation. The feeling of *alienation* for the designers was often a result of a resistance to adopt or encourage design thinking and processes within the organisation.

However, the perceived separation of the design team can also be of some benefit, allowing them a certain degree of objectiveness within the organisation.

Having design-led thinking instilled in the business plan does not necessarily translate in the short-term into a design ready organisation without continued support and encouragement from top-level management. It takes time to disseminate design processes and methods.

3.2 Common vocabulary and language

As discussed earlier, design readiness in itself is not enough to sustainably embed design thinking and processes. A common design vocabulary and language is required if people within the organisation are going to be able to understand and communicate what they are doing, why and how. It is the scaffolding upon which to build the culture of design within the organisation. Design vocabulary might use terms that sound familiar, but the meaning can be subtly different. Dissemination of a common vocabulary of service design, and the concept of what it is, is important if design tools and methods are to be used and applied consistently. To be integrated effectively, a design vocabulary and language should also respect the business language currently being used and provide a bridge between the two, thereby tailoring it to the organisation.

When those within the organisation know how to communicate what they are doing, it builds self-confidence and they are more likely to continue applying these new tools, methods and processes. As familiarity with the use of a design language grows it will become more integrated into the business language and practice of the company. At this point, it begins to become part of the business culture.

3.3 Dissemination of design thinking and processes

Once a common working vocabulary has been acquired, the dissemination of design thinking, the use of tools, methods and practices becomes much easier. Discussions and debates become more meaningful and insightful and the translation of service design propositions and blueprints into practical projects becomes more effective. Tools in themselves are insufficient; they need to be contextualised within projects where their use can be understood through the process of application.

The visual communication of processes, the introduction of the use of tools and methods in workshops, the experience of design processes within projects, all help to create the conditions where the dissemination of design thinking essentially goes viral within the organisation.

3.4 Getting and keeping management on-board

As discussed earlier, management can have a large influence on how effective design thinking and practices are disseminated across the organisation. If there is a sense of a lack of trust in the value of design and support in the use of design from management then it will not be long before design practices become nothing more than an add on, if they remain at all. By integrating design thinking into their management style, managers encourage the use of design amongst their staff.

When under pressure, it is all too easy for managers to revert to the business practices they were trained in and to neglect the value and use of design thinking. Managers can use design methods alongside other management tools as part of their planning and implementation and for communicating strategies to staff.

As a way of facilitating the uptake and embedding of new working practices across the NHS Institute for Innovation and Improvement they have produced a set of guidelines and information detailing the NHS Institute's *Work Process* that it aims to embed as the norm across the institute. In this way the organisation is validating the use of the new design-led processes.

3.5 Re-interpretation and development of tools and methods

When staff are confident in applying design thinking and the use of design tools they will naturally begin to re-interpret and re-design the tools and the application of them as required to fit new situations. At this point, staff members are no longer following guidelines but responding to the needs of each situation, adapting and designing the tools they will need and how they will be used to achieve a proposed outcome.

The replication of design tools and methods should be encouraged to include the necessary mutations required for their application under new conditions. Like DNA the tools need to evolve.

3.6 Functional learning and delivering value

During this study and through interviews with Tony Coultas at SDS, it became clear that it is important for an organisation to develop what we termed 'functional learning' - the ability to deliver value to the business while learning how to deliver and develop the service offerings. This in turn requires the service design team to rationalise the short-term delivery of value with the long-term delivery of business strategy. There is an essential need to balance these potentially conflicting points of view.

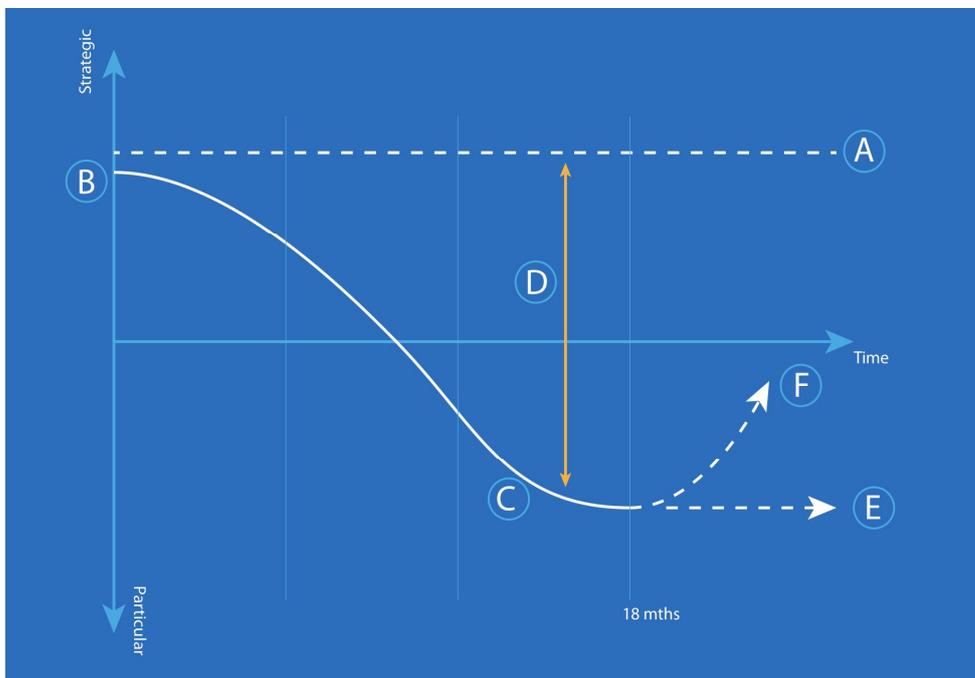


Figure 1. Rationalising the balance between 'strategic' and 'doing'

Service design straddles both the strategic (theoretical) and the particular, or practical, approaches. At directorate level, the organisation would like the service design team to

operate at the strategic level (A). When created the Service Design & Innovation (SD&I) team within SDS developed strategies for how they might develop and deliver services (B). After some time it was also important for the SD&I team to deliver value to the business by supporting the delivery of project outcomes (C). The tension between the two (D) can breed dissatisfaction in staff being pulled in two directions. Some designers are comfortable working at a strategic level while others prefer to be doing but often the organisation will make demands to do both. After a period of 18 months, it was recognised that a crisis point was being reached - how to switch back efficiently to develop strategy (F) without dropping the practical delivery of projects (E). The SD&I team realised that they would have to design a good, clean exit strategy to be able to return to developing business strategy while using any spare design capacity to support the practical projects.

By doing, evaluating and reflecting the service design team learned from these experiences and were able to adapt the way they delivered value to the organisation.

4 Building capacity and embedding design

Being able to interpret a service blueprint is not enough; you have to be able to make it happen. Developing the skills and knowledge of service design thinking, tools and methods within the in-house service design team is not enough to embed design within an organisation. It was not sufficient for the service design team to simply translate service blueprints into project plans, the service design team also had to treat other departments within the organisation as service users as well as service providers. They recognised that they were delivering a design service in addition to helping develop service provisions with these other departments.

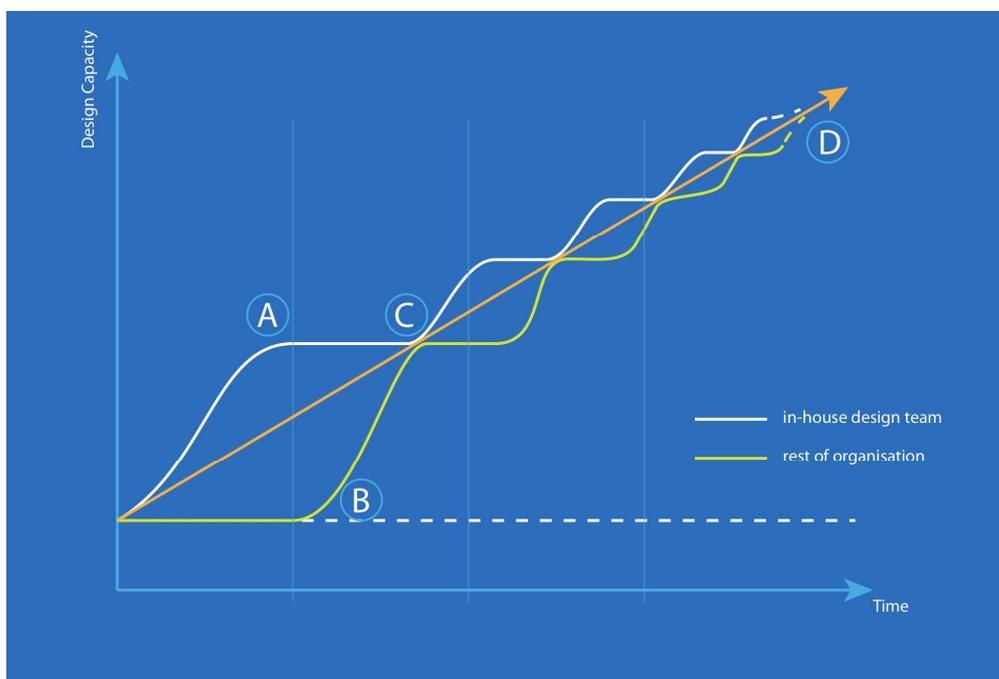


Figure 2. Building capabilities of in-house design team and the organisation

As the in-house design team developed their own design capabilities (A), they soon realised that the organisation was not yet developing its own design capacity (B). At this point the SD&I team within SDS engaged with other project teams to develop their service offerings.

The team ran workshops and training sessions with project groups within the organisation. These workshops not only helped disseminate and embed service design thinking and methods, they also allowed the service design team to learn more about how the organisation really worked, what needed to be done and how it could be improved. Having reached a convergence of capability at (C) the service design team was able to re-evaluate their strategy for moving forward. The goal eventually would be that both the in-house team and the rest of the organisation would continue to develop and embed design capacity but without as great a lag as in the initial phase. In time achieving a convergence and a fully embedded design culture within the organisation (D).

4.1 Moving forward

The journey has now reached a point where the Service Design and Innovation team understands that it has to ensure that the service design capability throughout the organisation is developed to a level that allows them all to move forward together. Not just developing the in-house service design team and leaving the organisation behind.

A key factor in the successful development of service design within SDS so far has been that the team has been allowed to *fail*. Support from director level has enabled the service design team to develop and innovate how service design is embedded within the company. Furthermore, the in-house team has developed the ability to deliver value to the business while learning how best to deliver and develop the service offerings - what has been termed here as 'functional learning.'

The designers, as well as the organisation, have had to remain patient and work the long strategy game while engaging with short-term projects that help disseminate design thinking, methods and processes. Disseminating an innovation culture while gaining insights into what innovation means within the organisation.

Embedding a design culture has a long gestation period - it takes time!

Acknowledgements

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Service walkthroughs to support service development

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Abstract

Service design is said to be a holistic design approach. This is evident in most service design literature and textbooks but still services are prototyped by focusing on separate parts rather than whole service journeys. In this paper we propose a technique called service walkthrough that can be used to represent whole services. We explore what information can be generated using the technique and how useful it is. We found that the technique helped identify the flow of information, problematic areas, and design opportunities. The prototype was generally well received by the participants. In addition to learning about information, the technique also revealed insights about time and interdependencies of the various parts of the service. Some remarks are also made about when the service walkthrough can be used in the service development process and considerations concerning the fidelity of service walkthroughs.

KEYWORDS: Service Prototyping, Service Development, Home Delivery Service

Introduction

How can whole services that do not yet exist be represented in prototypes? In current service design, prototyping is conducted in a quite “traditional” way, focussing on specific parts rather than whole coherent services (Blomkvist & Holmlid, 2010). While this traditional approach is probably useful, since prototyping in design has such a long and successful tradition, there is however a potential value in representing whole services rather than separate parts. The experience of a service may be seen by its customers as a whole experience (Goldstein et al., 2002) rather than single events, which has also been noted in disciplines with similar challenges (Pasman, 2011).

Also, contrary to current service prototyping practice, service scholars see services as a design “object” to be approached holistically. The manifesto of the Service Design Network, e.g. states that service design “is a holistic approach, which considers in an integrated way strategic, system, process and touchpoint design decisions.” (Service Design Network, n.d.).

The holistic aspect is also emphasised in a textbook on service design thinking where Marc Stickdorn have listed five principles of service design (Stickdorn, 2010). The five principles say that service design thinking is; user-centred, co-creative, sequencing, evidencing, and *holistic*. In 2009, Kimbell wrote that a service design approach “would see all /../ interfaces or ‘touchpoints’ with the customer (or other end users) as something to be thought of holistically, and it would seek to offer an intentionally-designed experience of the organization” (Kimbell, 2009, p.2-3). Service designers no doubt consider whole services in the front end of service development, but for some reason the practice of prototyping services has not been developed in this direction.

Based on the assumption that additional insights can be generated by developing the service prototyping practice and considering whole services, we propose the service walkthrough prototyping approach. The suggested service walkthrough approach attempts to use existing prototyping knowledge to support a more service-specific prototyping practice. We assume that service walkthrough can be used to address issues such as how different touchpoints of a service work together, how information travels through the service, and the general experience of the service. Potential candidate techniques that support a service walkthrough approach include roleplaying, acting, and drama (Brandt & Grunnet, 2000), bodystorming (Oulasvirta, Kurvinen, & Kankainen, 2003), and experience prototyping (Buchenau & Fulton Suri, 2000). Bodystorming and experience prototyping in particular are techniques that benefit from being used in real contexts, or situations that are as similar as possible to the intended final context (Oulasvirta, Kurvinen, & Kankainen, 2003). The service walkthrough approach uses a combination of the above techniques that traditionally has focussed more on single touchpoints rather than whole services. By utilising the mentioned techniques, and other existing prototyping knowledge, whole services can be enacted and walked through with little investment in terms of money and time. Here we try to explore what such a technique might contribute by asking what information can be generated and how useful the approach might be when developing new services.

Different service contexts

Services can take many shapes and forms. Some services are best described as trans- or crossmedia services that utilise a multitude of different service delivery platforms. Other services are mainly product centred with traditional perspectives on value and production. Platform services, that allow other stakeholders to contribute with content, is another type of constellation where the underlying business model many times is essentially different from that of other services. Services that can be described as journeys is the most prevalent kind of service as service designers are concerned, based on service design literature and tools that focus on customer journeys and how to visualise them. Regardless of how a specific service can be conceptualised, it will pose challenges for designers because the object of design will be different from traditional design objects.

In crossmedia and platform services many times it does not make sense to describe the service as a journey, or no journey can be identified because the service is totally dynamic, i.e. no sequence can be practically described. Crossmedia services are basically services than can be delivered through different kinds of media; the web, smartphones, television, games and so on. In such services, the experience of the service will change depending on how and where the customer is interacting with the service provider. Service journeys on the other hand, can be understood as journeys because a chronological sequence of interactions between customers and service provider can be identified. This makes the design object very

different from traditional design objects. To date, approaches that address these differences are scarce, as are documented practices of designing and prototyping in these settings. In crossmedia design, the issue of how experiences in these service constellations should be understood has been highlighted (Pasman, 2011):

“As a consequence the current design process will most likely be a pragmatic mix of the principles and characteristics of the design disciplines that constitute the individual platforms, such as web design, mobile design, game design, or graphic design. Real crossmedia design, however, should go beyond the individual disciplines and platforms in order to create fully integrated interactive experiences. Smooth, meaningful and logical transitions from one platform to another should take place, stretching and blurring their respective boundaries.” (ibid., p. 176)

When it comes to services that can be practically described as journeys, the issue of understanding the service as a whole, or unity, is equally relevant, and understanding how to make “[s]mooth, meaningful and logical transitions” (ibid.) between the different steps in the sequence should be considered as well. So far though, examples of service prototyping have more of the characteristics of a “pragmatic mix of the principles and characteristics of the design disciplines that constitute the individual” (ibid.) *touchpoints*. This line of thinking motivated the service walkthrough approach.

In this paper we show how a service walkthrough was utilised to represent the whole service journey in a relatively quick and inexpensive way. The technique is especially interesting when a service can be understood and practically described as a journey, and after a sensible beginning and end of a service has been decided upon. Service walkthroughs are also more relevant when new services are developed, since there is no existing service that can inform the design process about the behaviour of the service system. Walkthroughs can then potentially serve as shortcuts into a better understanding of how the service will perform and be experienced.

Describing the context

In this case, the service was intended to deliver food to peoples’ homes, based on a digital meal planning tool. The tool should help suggest a more varied and healthy diet, while the service as a whole also helps save money for the customers, as well as decrease the amount of food being thrown away. The project started with a number of people with some ideas about how to develop the service. The service was named PlanEatSmile, and had a network of stakeholders involved (**Error! Reference source not found.**). The tool contained a database of food recipes and restaurant menus, including information about ingredients and preparation instructions. Users were able to construct individual food preferences, including allergies and goals (such as eating more fish or eating more vegetarian food), and get recommendations for suitable meal plans as well as feedback on meal plans created by the users themselves. The user could construct a meal plan for the coming days and place an order for having the included food articles and restaurant menu items delivered home (or to the user’s work place).

Different parts of the order would be transferred to the grocery store, the restaurant, and the delivery company. The grocery store would then pack the groceries and store them in separate compartments for cold and warm groceries until the delivery service arrived to take the food to the customer. The restaurant would cook food based on the orders from the tool, that would later also be picked up by the delivery service and delivered to the customer. The meal planning tool was developed at the Department of Computer Science at Linköping University in collaboration with a diet and nutrition researcher. See e.g. (Aberg, 2009) for an

evaluation of an early system prototype. The main target group was career families with two working parents with children living at home.

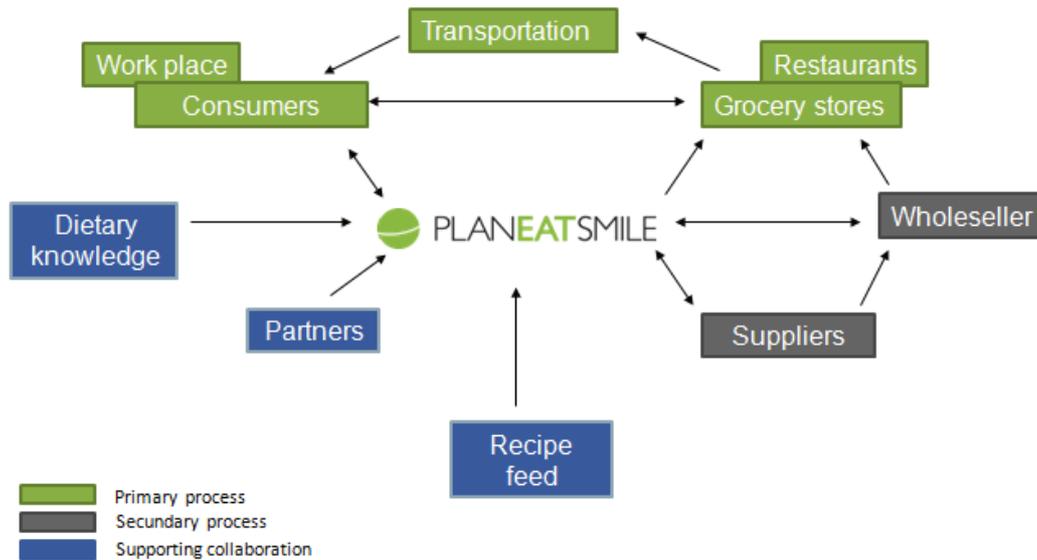


Figure 1: Collaboration plan

Representing the service

After a service journey had been identified and visualised, the service walkthrough was planned based on the current understanding of the service. Five persons were needed to represent all the relevant stakeholders. In addition to the people participating, see Table 1, a paper prototype (Ehn & Kyng, 1992) of the planning tool, props such as notes, receipts, fake food, bags and so on, paper and pens for all participants, and a serving trolley was used to represent the service.

Table 1: The prototype participants, their roles and level of involvement.

| Role in project | Designation | Type of involvement | Involved since | Role in prototype |
|-------------------|-------------|---------------------|----------------|-------------------|
| Researcher | R | Part time | 9 months | Delivery |
| Designer 1 | D1 | Full time | 4 months | Planning tool |
| Designer 2 | D2 | Part time | 9 months | Customer |
| Product Manager | PM | Full time | 6 months | Grocery store |
| Managing Director | MD | Full time | 6 months | Restaurant |

The walkthrough started by a short briefing about the service and how the service journey was supposed to be played out. D1 had prepared most of the prototype with guidance from the researcher (R). After the brief the participants chose what stakeholder to play, except for D1 who was in charge of representing all the actions of the planning tool. We all watched as the customer placed an order using the paper prototype. During the initial placing of the order all participants were present and one designer was in charge of all the actions of the meal-planning tool. We wanted everyone to have an idea about what the system did before going to separate locations. After the order was placed we moved to different rooms, see

Error! Reference source not found., we had a restaurant and a grocery store set up in really low fidelity with small pieces of paper representing ingredients and groceries. The serving trolley represented the delivery truck. It had two levels, one to represent a refrigerated area and one to represent a “normal” temperature area. The customer was located in a “house” and waited there for delivery.

The planning tool then provided the participants with information about the order and continuous updates about what day and time it was. The restaurant, the grocery store, and the delivery firm all received information about their parts of the service. D1 wrote down day and time on a piece of paper and walked around to all the stakeholders to synchronise time. All food needs to be picked up and delivered as quickly as possible so the timing was a challenge to prototype using our virtual time but at some point when they saw fit, the grocery store started packing groceries and the restaurant started cooking. The delivery firm

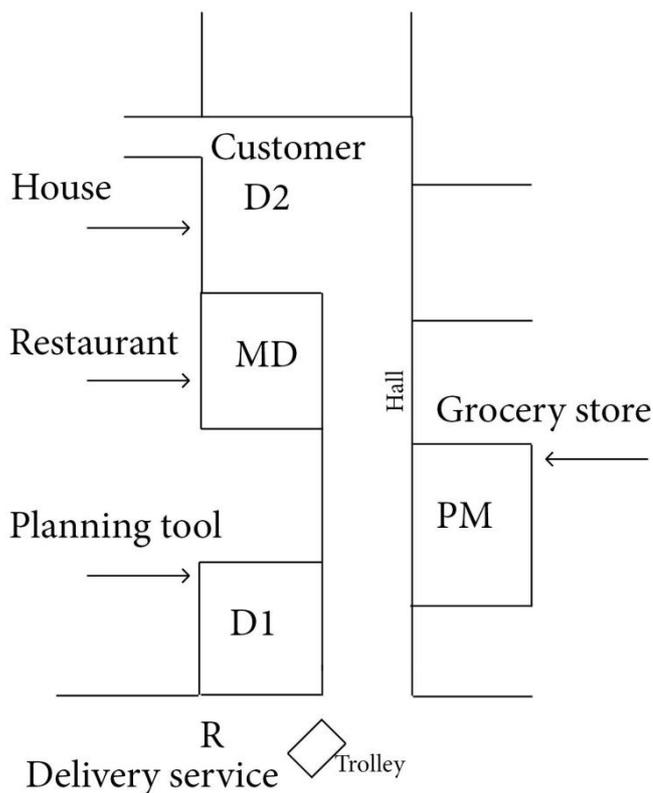


Figure 2: Prototype setting

then drove to the grocery store to make the first pick-up. This was the first human-to-human interaction and the first time that a document was exchanged, i.e. the order sent to the grocery store was signed and passed along with the delivery firm. Next, the delivery truck went to the restaurant where a similar procedure occurred. The restaurant had some instructions for how the food was to be handled and signed its version of the order and gave it to the delivery firm. The delivery firm then continued on to the customer where the second touchpoint from the customer’s point of view took place. The food was delivered and the customer signed the delivery firm’s copy of the order. That concluded the actual service walkthrough, which all in all took about 100 minutes.

In that time, the whole service had been walked through representing the most relevant stakeholder perspectives. During the walkthrough, techniques such as role playing, paper prototyping, and experience prototyping were used and facilitated by the use of product mock-ups. To validate the approach the researcher (R) later asked the participants about their respective experiences from taking part in the prototype. The results will be presented in the next section.

Reactions and insights

Here we will present some reactions from the participants and provide some more hands-on examples of insights gathered during prototyping. After the service walkthrough the participants were asked about their

- general impression,

- problematic aspects, and
- positive aspects.

The participants' general impression was that the walkthrough was informative. The idea was not to generate revolutionary new ideas, since the project was already about one year into the making and the general concept was pretty well understood. The ideas generated had more to do with specific, situation related challenges or situations that arose during the walkthrough. The two designers also felt that the walkthrough was fun and that it provided insights about how to proceed with the project and a more tangible and substantial way of understanding it. The walkthrough could also reveal situations where there was uncertainty or confusion (mostly about information), and what information was prioritised at what time. The designers seemed to feel that this was also helpful for their future work.

The enactment of roles provided specific insights according to the designers, such as new ways to understand information and stakeholders, despite the fact that the designers had already thought about the information it was a whole other thing to "feel which information was prioritised" and how to deal with it. On the other hand, PM – who had been working the longest with the actual service development – expressed a more sceptic view of the usefulness of the approach. PM felt that the session was informative but only for people that had little insight into the service beforehand. It is plausible that the walkthrough would have been more valuable at an earlier stage from the perspective of PM. On the other hand, MD – who was also not a designer and had a similar role as PM – found that insight into the prototyping approach was valuable.

Other negative aspects of the walkthrough included that the prototype was too detailed, especially the paper prototype of the planning tool. It was also difficult for some of the participants to stay in character over longer periods of waiting. This did however provide time to explore the separate stakeholders' situation. Using waiting time in a prototype situation is a unique opportunity for service prototypes. We also only had time for one walkthrough and only limited knowledge about the different stakeholders' actual service operations. One thing that was mentioned by all participants was that the prototype was not done in the real context. We had to "invent" the actual circumstances and MD suggested that live prototyping would have been better and might have rendered more understanding for stakeholders.

Example insights

To provide some examples about what kind of knowledge can be generated using this technique we have summarised some important insights and ideas. All participants had a lot of things they wanted to discuss after the walkthrough. Everyone had been equipped with a notepad so that any ideas or issues that came up during the walkthrough could be documented. Social aspects were identified as a result of roleplaying and enacting the different stakeholder roles. One such was the importance of the interactions between the different stakeholders when they met, and when the food was delivered to the customer. This is actually the only contact the customer had with the service personnel apart from placing an order in the planning tool. We had a long discussion about what this touchpoint should communicate and who the customer should perceive as the service provider. In that way, different granularity levels could be explored by zooming between the whole service and individual touchpoints.

Many practical issues were raised as well, such as having phone numbers and contact information that allow stakeholders and customers to provide feedback or inform that

something is not working properly, e.g. if the food hasn't arrived as planned. This prompted us to think about whom to contact about what, since the service is distributed over four different service providers. For the restaurant food we talked about including instructions about how to heat the food up, but also about how to store it and at what temperature. Issues about how to handle the packing and transportation of the food was also raised. We had also noticed during the walkthrough that lists and receipts were passed along, signed, and exchanged a lot by the different stakeholders. This was based on the idea that all the stakeholders would want service evidence and that the customer and the people at PlanEatSmile in the end would want traceability in the service – a way to see where, and if, something had gone wrong. This was practically difficult however since for instance, going through all the groceries at the time of delivery would make that process too time consuming. Hence, the customer would have to sign a paper without knowing that all the groceries were actually delivered.

We also started thinking about the internal roles in the respective companies and who actually would be doing what. This generated ideas about what information was needed, for whom, and at what time – and what information the different roles actually cared about. Since we had recently walked through the service we could also discuss this matter in a more informed way and think about the different situations in relation to the prototyping activities, which would have been difficult without the actual experience. The walkthrough also revealed the intimate connection between time and information, e.g. at what time do the stakeholders need to know what. The right information at the wrong time can be useless for instance if that information is not accessible when it is needed. Also, the reliability of information was discussed – how can information that is supposed to represent actual events (signed papers) be verified, when the actual situation is not wholly understood (the number of groceries in the bags).

Finally, we present some examples of questions that were raised; How can it be confirmed that the food has arrived? What happens if the customer is not home? In what order should the food be delivered? How can the restaurant and the grocery store communicate with the customers? What existing solutions are there that the service can be connected to? Questions such as these were discussed after the walkthrough and ideas related to them were generated. Questions like these could have been used to prepare a workshop to discuss and generate ideas about the service, perhaps together with the concerned stakeholders.

Discussion

By using the service walkthrough technique we were able to prototype the flow of information of the service. This was done by combining roleplaying, paper prototyping, product mock-ups, bodystorming, and experience prototyping. This led to a situated and embodied understanding of the service that was valuable during the following discussions. We found that providing opportunities for reflection might enhance or facilitate participants' ability to identify interesting aspects of the service. It is important to be aware of at what time in the process prototyping happens as well as what the purpose of the activity is. This is made easier by adjusting the fidelity of the different touchpoints in an appropriate way.

Overall findings

The walkthrough was informative and the enactment of roles provided additional insights about the service than had previously been addressed. Using the body to explore the service,

and playing a role adds possibilities to understand what it is like to be part of the service and reveal additional information. People use their context to work, function, and make sense of situations in ways that are difficult to access by just passively imagining scenarios, or making cognitive walkthroughs. Since we did not have access to the actual situation in this walkthrough many aspects had to be imagined, which was experienced as a weakness of the technique. However, many ideas and issues were identified, mostly related to information and how it flowed through the service and how coherent it was experienced to be. This was possible due to having all the touchpoints represented in the walkthrough.

Opportunities for reflection

Using the paper prototype and other aspects of the planning tool was perceived by D1 as time consuming. It was, however, possible for the other participants to use this extra time to think and explore different aspects of the service from different stakeholder perspectives. This meant that prototyping in this instance turned into a live version of the What if technique – what will happen if I don't get the order on time, what will happen if the customer is not home, in what order should I deliver the food and so on.

Position in process

The importance of when prototyping happens in the design process, and its connection to the fidelity of the prototype representation, has been discussed in previous publications (Blomkvist & Holmlid, 2011). In this case the walkthrough came in quite late in the process, just a couple of months before a planned pilot was to be launched. As mentioned, PM felt that the walkthrough was not very informative, and more like “repetition”. While it's good that we were able to repeat the insights that had been generated during one year of working with the development of the service, it would probably feel more informative if it happened earlier in the process. The fidelity of the prototype was perhaps also better suited for a prototype earlier in a project. On the other hand, several issues with respect to service quality were identified.

The prototype could not be carried out in a realistic environment. Before the service could be tested in a more valid context, it was important that we knew a certain amount of things. It would have been too unprofessional to start before some aspects, such as what information should be provided by whom and when, had been finalised. By making the service representation fidelity a little lower we were able to make the whole representation in just around 10 hours, but at the same time missing many of the features of the servicescape that influence the experience, and other aspects such as distance, time, and actual social relations. Most of the participants mentioned that the prototype would have generated more valuable feedback in a more realistic – and higher fidelity – setting.

There was a discrepancy between the designers' impression of using the technique and the two other participants. The designers were responsible for the prototype and also the ones who were most interested in getting a result out of the prototyping activity. They are also trained to think about prototypes in another way than the average person which probably accounts for some of the discrepancy. The main critique from the participants against the service walkthrough technique, was that it did not generate much new information. This was however not the prioritised purpose of the prototype, but rather to verify whether the service would perform as expected and reveal things that could not otherwise be accessed using traditional visualisations or prototyping approaches. If the prototype had been created earlier in the process it could potentially have saved time and worked as a shortcut into more

specific issues related to the service as a whole. The fidelity of the prototype could perhaps have been adjusted to better suit the position in the development process.

Fidelity

The fidelity of the paper prototype made it more time consuming than other parts of the service. This also meant that this part of the prototype was not discussed much afterwards. Perhaps it was seen as more complete and not open for discussion as other parts of the service. In this way, fidelity can be adjusted to put more focus on certain parts. High fidelity representations can possibly be given more attention and time, which is something to be aware of. Further studies of how different levels of fidelity influence the service walkthrough approach would be interesting to see.

Also, the walkthrough made us think about both presence and absence, in the sense that it urged us to think about which stakeholders were represented and not, how many in each organisation we could actually represent and what that meant. Having people from the other service organisations, and actual customers, would have meant a higher fidelity and validity of the prototype. This could have increased the usefulness of the generated insights and knowledge, while training and preparing the involved stakeholders. By walking through the service we became aware of the presence and absence of the service provider for the customer. In some cases it might be better to show the PlanEatSmile logo, and sometimes it might be better if the perceived provider is actually the delivery firm, the grocery store, or the restaurant. The perceived service provider will be the one who is associated with the service experience – the service in the head of the customer (Goldstein et al., 2002) – and presumably the one the customers will hold accountable for the service. Thinking about when and where in the service to be visible from the perspective of the stakeholders respectively is a valuable aspect. In some instances the customer will probably be more satisfied with the service, e.g. after a good meal, when the food is delivered on time, than others, e.g. paying for the food, when the food is delivered late, and so on.

Conclusions

The service walkthrough technique was useful in developing the meal planning and delivery service. It provided embodied and enacted insights into how the service was perceived and how it performed. We could directly use some insights to improve the way information travelled through the system and better understand how it should be designed. The level of fidelity of representation also made it easier for us to consider the information and find interesting, actual and practical issues related to it. This technique also added a time aspect that spanned over the whole flow and not just single touchpoints. Another aspect is that we could actually think about the coherence of the service, how the different parts and stakeholders related to each other, and perhaps to some extent what the resulting experience was like. The walkthrough allows for a situated and embodied understanding of the service, and though the inferences that can be made about the actual service is limited it was possible to generate a lot of knowledge in short time that relate to the actual experience of being in the service from the view of multiple stakeholders.

Acknowledgements

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Designing Smart Textile Services through value networks, team mental models and shared ownership

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Abstract

The goal of Smart Textile Services is to integrate existing knowledge from the separate domains of textile technology and services. As no single actor can meaningfully understand and realize the creation of Product Service Systems multiple actors need to team up with relevant partners. The contribution of this paper is to describe the initiation of a bottom-up approach aiming to co-design Smart Textile Services in collaboration with partners from the Dutch textile and technology industry, service providers, creative hubs and academic institutes. The concepts of value networks, team mental models and shared ownership are used to design and analyse two co-design workshops that took place within the consortium: a co-reflection and a co-creation workshop. We will use the same concepts to reflect on how a bottom-up approach can be used for designing Smart Textile Services, and how a designer can contribute to this process. Further, we will indicate how we are planning to pursue this bottom-up approach in future research.

KEYWORDS: product service systems, co-creation, innovation, designerly approach, smart textiles

Introduction

The role of products and the design process has changed tremendously in recent years. The transitions from the industrial economy to the experience economy and currently the knowledge economy to the transformation economy (Brand & Rocch 2011) require businesses to keep adapting and revalidating their value propositions (Morelli 2009). In management studies this is also visible in the transition from goods-dominant logic (G-D Logic) to service-dominant logic (S-D Logic) (Vargo, Maglio, & Akaka 2008), which changed how a total value proposition relates to services. Because of these transitions, companies

have to adopt new networked innovation methods, which require people, who not only come from different disciplines, but also come from different organizations and companies to design together (Bergema, Valkenburg, Kleinsmann, & de Bont 2010). This is the case of the STS CRISP project. Within the framework of the Dutch Creative Industry Scientific Program (CRISP 2011), we have started to create the structure that will support the development of innovative Product Service Systems in the context of Smart Textile Services (STS). The combination of soft materials and high technology is the area of smart textiles. The European textiles and textiles related industry is dealing with increasing price competition coming from lower cost regions, Smart Textile Services can give the industry an added value, which enables it to keep its competitive position in the world. The goal of STS CRISP is to integrate existing knowledge from the separate domains of textile (soft materials), technology and services.

For the development of Smart Textile Services we initiated a bottom-up approach. In this article we will describe a co-design process, in which a co-reflection workshop and a co-creation workshop are activities focussing on the collective creativity of users and stakeholders (Mattelmäki & Sleeswijk Visser 2011). The co-reflection workshop helped us to define a collaboration space and the co-creation workshop helped us to come to a first set of design descriptions. We will reflect on the role of these workshops using the concepts of *value networks*, *team mental models* and *shared ownership*. Finally, we will discuss how this bottom-up approach will be continued in the next phases of the project and the role of the designer in this process in more detail.

Value networks, team mental models and shared ownership in Product Service Systems

As point of departure we use the definition of Product Service Systems (PSS): “tangible products and intangible services designed and combined so that they jointly are capable of fulfilling specific customer needs” (Tukker 2004). In a PSS, companies often extend their product chains into value networks existing from several companies created for the development of specific products and services (Pawar, Beltagui, & Riedel 2009). Challenges for these networks can be the need of unification of before discrete product and service elements, and also the need of firms with competing motivations to vertically integrate or outsource activities (Williams 2007). This vertical integration is further illustrated by the different layers in Figure 1. We further define PSS by focussing on the challenge in the field of design in which the ‘one-person – one product’ approach is slowly being transformed in favour of the ‘multiple-nodes’ approach of complex systems (Frens & Overbeeke 2009). As illustrated in the middle layer of Figure 1, the challenge is not only in the design of these multiple-nodes (or touch points), but the ability of the nodes to adapt to the interconnections with other products, with other services and the different users: the total experience.

In literature of Product Service Systems most classifications make a distinction between three main categories (Tukker 2004): product-oriented services (products are sold, but extra services are added), use-oriented services (product is not the centre of the business model, but in ownership of provider and can be shared by multiple users) and result-oriented services (client and provider agree on a result, no predetermined product involved). Product Service Systems already exists in the textile industry for a longer period. For example, the damask weaving company “W.J. van Hoogerwou & Zonen” was offering product-oriented services since the mid-19th century (Pel 1997). Besides production, customization and selling of table clothing and napkins the company also had a laundry service. For an additional fee the clients could bring the product back to the company where everything was professionally cleaned, ironed and packaged. Examples of result-oriented services are companies specialized in hygiene services, for example Initial Hokatex (Initial Hokatex 2011) and Lips Healthcare (LIPS 2011). These companies offer a more hygienic environment for their clients as a service. To achieve this goal textile products are included in the service, for example by providing pick-up/drop-off, cleaning and maintenance for the textiles.

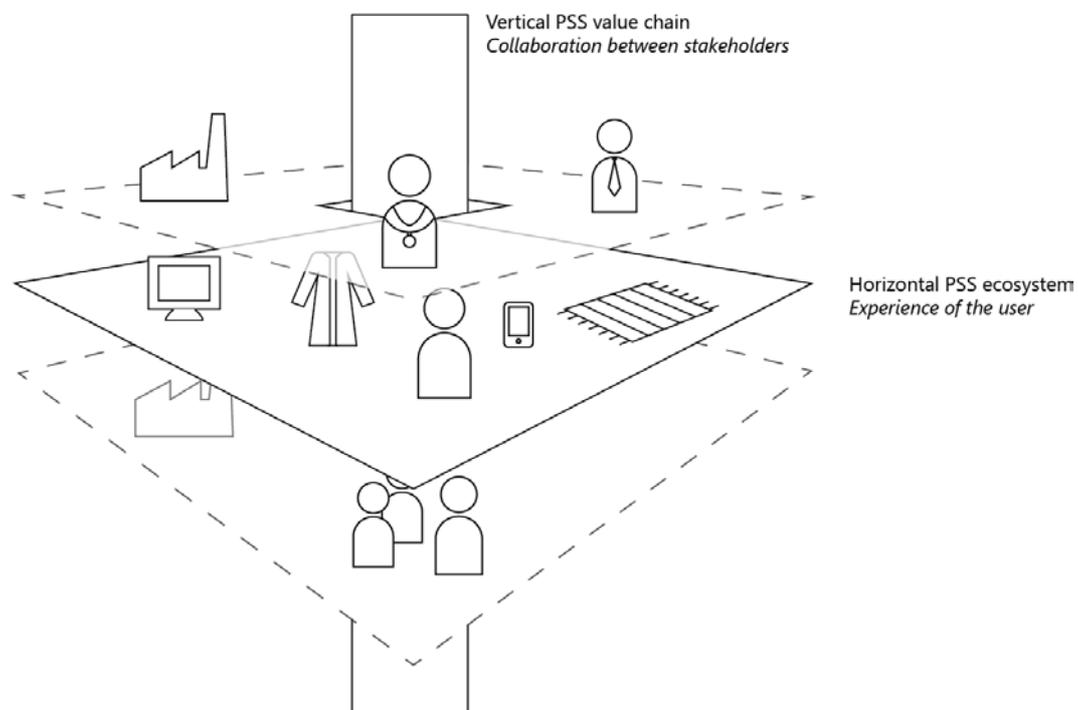


Figure 1 shows an example of vertical and horizontal connections in a PSS.

Smart Textile Services are PSS that incorporate smart textiles. There are more and more examples of wearable accessories that integrate technology. For example WakeMate (Perfect Third Inc., 2011) is a wristband that monitors wrist motion and translates this into sleep data, the wristband is made from textile and connects through Bluetooth to an application on a mobile phone. The application calculates the ideal wake-up time closest to the alarm setting of the phone of the user. This data is uploaded to an online platform that compiles an overview of the sleep statistics. It is our goal to push these Smart Textile Services further than a combination of textile and technology. The goal is to integrate the design and production processes of textile, technology and services. To create such a *value network* it is needed that partners from different areas and with different expertise are able to collaborate. Collaboration between these partners will require a sense of common ground: “a common representation that could serve as a touchstone for coordinating the members’ different perspectives on the problem” (Schwartz, 1995). A concept that further describes common

ground in the specific area of design teams is the *team mental model*, which describes how knowledge is constructed and shared by a team to enable goal-directed actions (Mohammed, Ferzandi, & Hamilton 2010).

For people to participate in, and co-develop the value network it is necessary to create the conditions that will engage people to participate in the collaboration. Ownership is perceived as something that belongs to yourself. It is a feeling of possessing something, such as the research results or interpretations over these results (F. Sleswijk Visser 2009). When this feeling of ownership is shared by stakeholders in the value network it can become a factor of engagement, because it enables stakeholders to become co-authors (Mongiat & Snook 2007). In participatory design practices it is known that *shared ownership* can be elicited for example from the site selection, the language and the participatory prototyping elements of the co-design sessions (Muller 2002). In the next chapter we will describe two co-design workshops that were conducted to initiate the bottom-up approach for designing Smart Textile Services. We will use the *value network*, *team mental model* and *shared ownership* concepts to describe the design and results of these two co-design workshops.

Co-design activities with multiple stakeholders

Partners in the consortium come from five different fields: academic (TU/e Department of Industrial Design, Design Academy Eindhoven, TUD Department of Industrial Design Engineering and Saxion Universities for Applied Sciences), public (Audax Textile Museum, De Waag Society, V2_), textile production (MODINT, Contact Groep Textiel), interactive product design and engineering (Unit040 Ontwerp bv., Metatronics) and a service provider (De Wever). In our bottom-up approach we are looking for methods to engage the partners early in the design process of Smart Textile Services. For this purpose we organized two workshops in which most consortium partners participated. The co-reflection workshop had a focus on the exchange of expertise and expectations and took place in Eindhoven University of Technology. The co-creation workshop focussed on the exchange of project directions and skills through making. This workshop was organized in collaboration with Saxion University of Applied Sciences in Enschede and the Fab Lab of Enschede.

Co-reflection workshop

For the first meeting with all the consortium partners we had several goals in mind, an aim for the *value network* (to encourage relationship building between the consortium partners from different disciplines), a *team mental model* aim (to create a narrative for the project to continue in), an aim for the *shared ownership* (to explore how people relate to the work created in collaborative sessions) and a pedagogical aim (to let participants experience working with a designer). Co-reflection is an especially interesting technique for the involvement of stakeholders during the design process as it fosters co-operation through sharing, intersubjective understanding and relationship building through collaborative critical thinking (Tomico & Garcia 2011). To start the co-reflection process we prepared and collected initial material to reflect on by visiting each partner. Together with every participant we created a short video to introduce themselves, their company or institute and their work. In addition, the participants were asked to bring an object to the workshop that would demonstrate their expertise or could be related to the project in another way (some of the objects are shown in Figure 2).



Figure 2 the table with objects brought by participants, post-it notes and name-cards.

The workshop itself was divided in four parts. First, the introduction video was shown that introduced every participant, this would ensure the introduction time would fit in the planned schedule. Secondly, the participants introduced shortly the objects which they brought to the workshop and added orange post-it notes to explain their expertise and green notes for their expectation and goals related to the project. Then the object and notes were placed on the table. The placement of the object was a collaborative effort that would determine the relation to the other things already on the table and would lead to an emerging structure of the project. When all the objects were placed on the table the workshop continued to structure the results by inviting participants individually or in small groups to create descriptions and define the areas that were formed.

Co-reflection workshop results

This structuring activity resulted in six areas that we defined later as the collaboration space of the project and is shown in Figure 3. The collaboration space consisted of six areas: *outcomes and valorisation* (the design or the development process from which we gain knowledge on how we come to this outcome), *friends* (workshops to share knowledge in depth, field days to explore opportunities for smart textiles, reflection to look at the development of the project and the relations created), *societal impact* (bridging technology to applications, make and deploy new experiences), *technology exploration* (use design to explore, share and use the knowledge from the different partners), *creative vs. constraints* (how constraints from the user, market, production make the project develop and change) and *entrepreneurship* (developing Smart Textile Services with a strong market positioning and value for society). Participants added cards with their name to the areas to indicate in which areas they were interested to continue working in (Figure 2 shows the name cards next to the objects). And finally, two participants for each area continued discussing the definition and finished by presenting their understanding of the essence of the area to all participants.

The areas in the collaboration space can be considered as the start of the design narrative. It is knowledge that all the participants share: the *team mental model*. Because everybody added their name cards to certain areas it also led to a feeling of commitment and *ownership* of the areas shared by the people participating in the workshop. Regarding the *value network* aim we observed that the technology exploration area and the friends area were very popular because people recognized their expertise and goals. This will introduce a challenge for the development of the Product Service System. Many technology partners have as a goal to explore the societal impact, while their expertise is in the technology exploration area. It will require a balance from participants to switch between what they are used to do and what they want to learn. Summarizing, the workshop helped us to find out what everybody has in common, which converged the scope of the project. Further, we learned how our skills can be used fully and how we can complement each other. More importantly, the workshop helped to define common language for future collaboration.

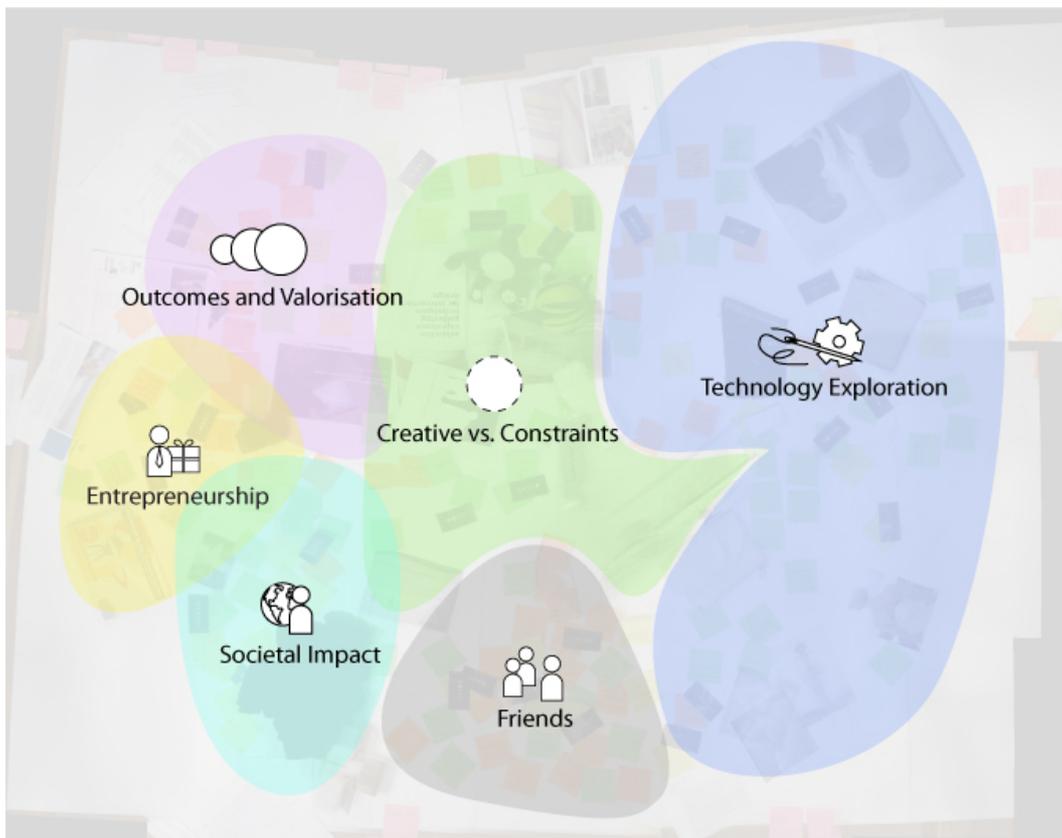


Figure 3 the collaboration space that emerged during the co-reflection workshop.

Co-creation workshop

The co-reflection workshop previously described contributed mainly to the narrative of the design process, the *team mental model*. The *value network* and notion of *shared ownership* were developed less elaborately because the step from the collaboration space to the definition of design directions had not been taken previously. In the second workshop the goal was not only to define these design directions (continue defining the *value network*), but also to exchange skills, understanding the value of each partner for the project, and experience the difficulties of working with textiles and technology (expanding the *team mental model*). Making was the main approach to achieve these goals during the workshop, also to increase the notion of *shared ownership* (Sanders 2000).

The consortium partners were asked to do a sensitizing pre-task before the workshop to describe ideas they had regarding smart textiles. These could be supported by drawings, images, materials, etc. The workshop started with 17 participants presenting 33 ideas to each other. After the presentation the ideas were grouped in corresponding topics on a wall (shown in Figure 4). We used the same method as in the co-reflection workshop to define ownership of the groups, by participants placing their name on the ideas they were interested in to develop further. By choosing the ideas and topics most people were interested in, eventually five project teams emerged in which participants from different disciplines teamed-up to continue working on a project idea. By experimenting with the materials and tools available (Figure 5 shows one of the participants integrating technology and textile) the teams created prototypes ranging from visual mock-ups to working models (of course with very limited functionality). After each team presented their prototype, a rough plan of action was made which would help the teams to translate their idea into a further developed product and service.



Figure 4 shows the wall with idea descriptions grouped in four types: product proposals, application area (elderly care), approach (old crafts and new technology) and technology.

Co-creation workshop results

Reflecting on the project directions created with the participants we can discover different types of projects. Some of the projects were very concrete problem solving *product proposals* (for example a bed sheet that can monitor patients health), other projects proposed an *application area* (connected textile objects in the domain of elderly care), a third type was a *design approach* (mixing old crafts with new technology) and then there were projects which started from technology (a modular textile prototyping kit). Although the project ideas were basic, what is important is that they showed that there are different ways to create common ground between participants. Participants could connect to each other from different levels but still meet in the mutual understanding of the project definition and build a *team mental model*.

Since the workshop was hosted in the Fab Lab (a small-scale workshop offering digital fabrication) the tools for prototyping and making were at hand. The context contributed to the second part of the workshop in lowering the threshold to start making. However, the process of making did not develop without frictions and frustration. The challenge to translate abstract ideas into concrete tangible prototypes, as well as the ability of people to use the available materials were barriers. These frictions created new input for the creative process; participants needed to work together to create a shared end-result (*shared ownership*) and the concreteness of creating a tangible outcome enforced the participants to consider the details of their project. Feedback from the participants showed that this approach indeed provided new insights in collaboration (better insight in the *value network*) and the approach of other people (better understanding of the *team mental model*). The service provider partner commented that the workshop showed new ways of looking at things and a new approach to solve problems. One of the technological partners commented that this is a much more creative way of finding new opportunities for smart textiles than they are used to.

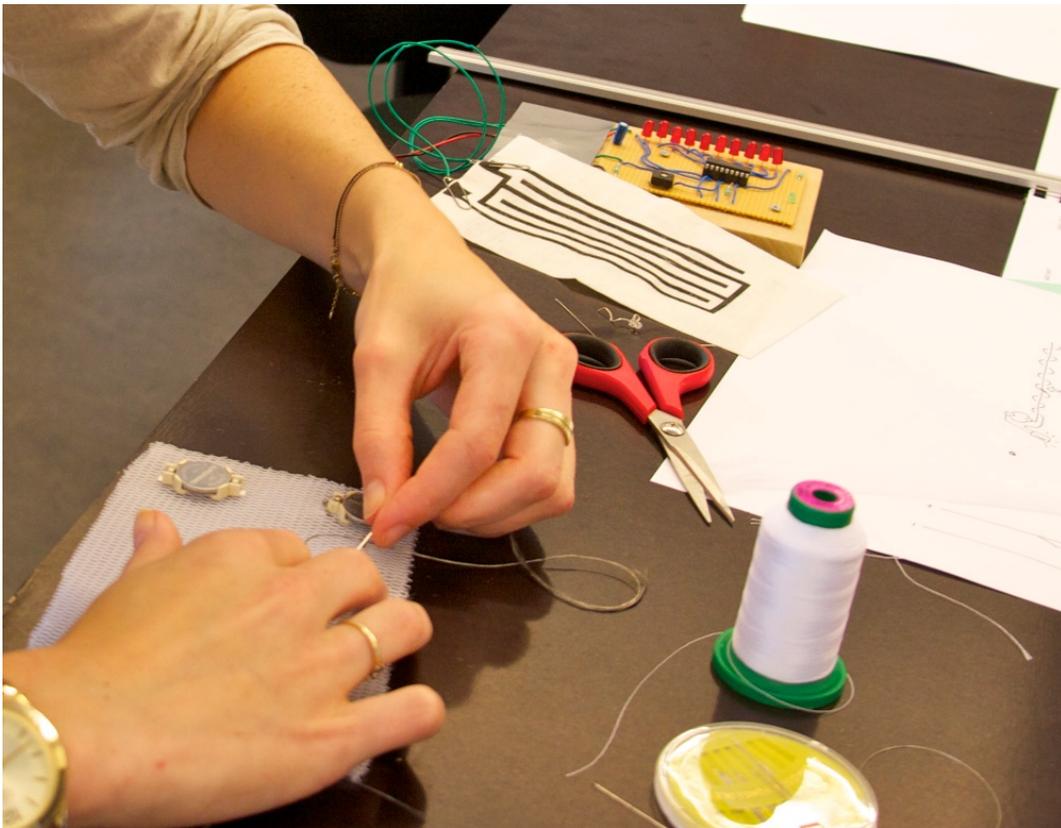


Figure 5 example of making prototypes during the workshop. One of the participants using basic textile and technology tools to create a prototype.

Discussion

By doing the workshops we are starting to see the contours of a new *value network* in the context of Smart Textile Services, designed bottom-up in a collaborative effort with all the partners. The narrative that develops because of these activities is an important element of the co-design process. The workshops are following-up on each other and provide a *team mental model* between the consortium partners who participate.

In both workshops we encouraged the participants to place their names on directions or themes they were interested in. This was an important step for the co-design process since it enforced the partners to take sides, position themselves, give credit, and get responsibility; it helped to create feeling of *ownership* shared by all the partners. Most participants participated

in the first workshop as well as the second workshop. But since the process is dynamic, it is possible for new partners to join at any given moment. This happened during the second workshop and resulted in an interesting observation: the partners who were new in the second workshop communicated the introduction about their expertise and expectations within the description of their initial ideas. This resulted in proposals in line with the larger topics within the company of the partner (for example the already existing research lines “co-creation” and “technical craft” proposed by the public partners) and already further developed product ideas for which specific partners were needed (one of the partners was developing a monitoring bed sheet and needed partners). This insight teaches us that we will need to think about how to involve new partners in the process and how to include them in this value network. The *team mental model* is a dynamic body of knowledge, which changes based on any interactions within the value network.

Another challenge is in the involvement of production partners in the process. The knowledge of these people is necessary to come-up with relevant and feasible Product Service Systems. Because these companies are often highly specialized it is harder to show the value of such a broad development process and the need for them to be involved early in the process, for this a sense of *shared ownership* needs to be triggered in possibly different ways than in the workshops as they were organised. A limitation of the workshops is the focus on products instead of services in this stage. In some project directions it is easier to discover the service component than in others. By thinking about who to include in the *value network* and involving partners from different disciplines we can make sure that the ideas we develop involve both vertical and horizontal connections (when thinking back of the representation in Figure 1). One of the characteristics of the bottom-up approach to develop PSS is the possibility to add new partners, new services and even new application areas to the system at a later point in time. By starting from a basic configuration and by showing the experience of individual touch points it is possible to convince people to join the momentum.

Future research

The changing role of the designer leads to new questions and discussion points. We learned from the co-reflection workshop that it is not easy to create a value-network that can be sustained after a collaborative activity. Which roles are necessary to support such a *value network* in its growth? Can a designer take these roles? We experienced in both workshops that every activity within the value network contributed to the *team mental model*. This poses questions such as, how to deal with new partners in the value network, how to transfer knowledge from activities undertaken with a smaller group of partners to the larger value network? During the workshops we noticed that *ownership* between the partners is useful to distribute responsibilities and to find out what people are really interested in. But can this shared ownership also be carried further after the workshops? How can the ownership be mitigated when the direction is becoming less relevant? What happens with the value network when designers develop directions further after the workshops?

Designers can add value in the design process of PSS in various ways (Han 2010), for example by having a leading role (entrepreneur, strategist, analyst), facilitating role (workshop facilitator, storyteller, contextual expert) or producing role (industrial designer, user researcher, engineer). Designers switching between and functioning as “glue” between disciplines introduce a whole new issue of complexity to the design profession. There have been efforts in the field of design research to address this, for example with the reflective transformative iterative process (Hummels & Frens 2008), which enables designers to handle complexity by switching between design activities and reflection on action.

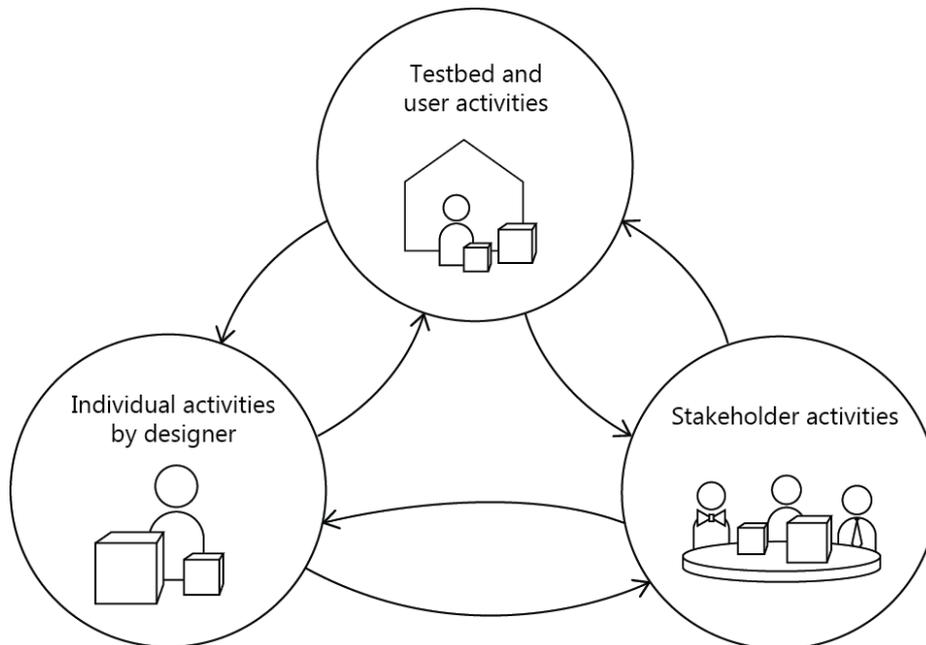


Figure 6 illustrates a bottom-up process for designing Smart Textile Services.

In the workshops we placed the designer on the same level as the other participants. This was a conscious decision as we were trying to yield input from the consortium partners. As Figure 6 shows, we do see this as one step in the development process. At some point the designer needs to integrate the information, envision the PSS and concretize the value proposition. We will continue this work by switching between this primacy of the designer, co-design but also to test the PSS experience in the context of the intended user and application area, as currently being implemented in test bed settings (van Gent et al. 2011). In our future research we will further investigate these possibilities and raised questions through continuing with this bottom-up approach for designing Smart Textile Services.

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A Community Centered Design approach to developing service prototypes*

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Abstract

This paper presents Feeding Milan, an ongoing research project on sustainable “place” development, focusing on the importance of using a Community Centred Design approach (CCD) and service prototyping as strategies to build collaborative food networks. In this framework sustainable urban and periurban development is the central objective of the work, where the hypothesis that only by using local resources and by activating collaborative and open services it is possible to pursue real, tangible and effective improvements in quality of life and environmental benefits.

The CCD approach is presented, then the authors outline a service design tool developed for co-designing with and within the local food communities and they define the process of service prototyping applied to an on-field case.

The paper concludes by describing the project as a Living Lab, where the aim is to point out how service design may improve the quality of life in rururban areas by involving local communities in targeted steps of the solution development process, in order to support agricultural activities and shorten up the food chain.

KEYWORDS: Community Centered Design, co-design, rapid prototyping, food networks, living lab.

“Feeding Milan” scenario

“Feeding Milan. Energies for change” (Nutrire Milano. Energie per il cambiamento) is a research program started in 2010 and promoted by a partnership between academic institutions and local players in the Milanese area.

It started from the observation that in the Milanese urban area, the demand for high quality, fresh food hugely exceeds the actual, available production, despite the presence of a large, potential “urban larder” known as *Agricultural Park South Milan*. This is a 47,000 ha wide area of intensive agro-industry, it includes 63 municipalities where only 3% of farms practice sustainable agriculture.

Agricultural Park South Milan is a peri-urban area, lying in the urban fringe where the city boundaries blur into the countryside, giving rise to new conflicts and unprecedented opportunities (Donadieu, 2005).

In such a context, the main strategy to support the demand is to make agriculture the presidium of the area’s regional quality. This means revitalising local networks, encouraging the sharing of common principles and optimising resources in order to create a new regional system. The emerging vision prefigures a rural-urban area where agriculture flourishes by feeding the city (*de-mediation*) and, at the same time, offers city dwellers opportunities for a multiplicity of farming and nature related activities (Simeone, 2010) (*multifunctionality*).

Feeding Milan is a project that concerns *Design for Social Innovation* (Brown, Wyatt, 2010) and social entrepreneurship (Leadbeater, 2007): it fosters service solutions for alternative food provision based on innovation that will support social and

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¹ The concept of multifunctionality in agriculture enables a farm to diversify its sources of income by supplying other non-commodity outputs alongside its primary function of producing food, thus contributing to the socio-economic viability of many rural areas. These additional functions can be seen as services linked to the environment, territory and people.

environmental goals (Murray, 2009). Such innovative solutions need to be constantly created, tested and re-created. Here designers play the role of promoter of solutions that, once implemented, have to be self-sustainable and managed by the community of shareholders (consumers and producers).

Work in progress

Since its beginning, the *Feeding Milan* scenario has been described as “a story of stories” where such “stories” (Cantù, Simeone, 2011b) are the seeds that give shape and substance to the scenario values, being *local projects* within a *framework project*. At this stage, designers have activated several local projects; some of them are already running, others are in the prototyping stage and others are waiting to be implemented. To date they are the following:

Milan Earth Market: a monthly farmers’ market, the first in Milan on public soil. The aim is to create a board of farmers to manage the activity. Running since December 2009;

Farmer’s Foodbox: a weekly home delivery of fresh local food with a logistic system that relies on so-called proximity points: shops and offices that collect the boxes to be delivered to the final users. Now testing, to be released in spring 2012;

Super-coop: Super-coop is a concept for a new kind of collaborative supermarket totally managed by customers, who may also be firms. It works as a sort of club where the firms collaborate to run the service effectively and where they can buy food, provided by local farmers, for a cheaper price in exchange for 3 hours per month of work in the coop;

Yes Weekend: the *Park’s Tour Agency*. It’s a catalogue of “do-it-yourself” services for local tourism in the Agricultural Park;

B-Trans: a system of routes and bike sharing stations in the farmhouses of the Park, linked to the Milan public transport network. The service has already been tested and the on-line platform with the suggested routes will be up and running by the beginning of 2012;

Pick Your Own: a network of farms for do-it-yourself fruit picking. It works as a sort of CSA that asks consumers to adopt a tree in the Park in order to get a “passepartout” to pick the fruit in the different farms of the network;

Local bread chain: the first harvest with the pilot farmers was completed in summer 2011 and the first bread was sold in the September 2011 at the Earth Market. Some other distribution channels are at the designing stage.

According to Drayton, new solutions need to be constantly tested and recreated in an iterative process which aims to design the most suitable solution according to the context, to the available resources, to the actors involved and the actual demand for innovation. Indeed, the *Feeding Milan* approach to each local project is rapid-prototyping oriented: this means that every local project is generated and discussed with the broad design community of producers and consumers from its beginning. In order to do that, designers have opened a research window within the Earth Market: the “Ideas Sharing Stall”.

Community Centred Design Approach

According to Meroni (2008), Community Centered Design (CCD) is an approach that scales up the consolidated methods and tools of User Centered Design to community size. She proposes to refer to design focusing on creative communities (Meroni, 2007) as CCD “*where understanding values and behaviors and collaborating with the most active social communities in conceiving and developing solutions* (Ogilvy, 2002; Jégou, Manzini, 2008) *is the distinctive work of the designer*”.

CCD is not focused on the single user but on the entire community as the enabler of local change, as a resource to be valorised and from which to learn.

Working with such an approach, design professionals are required to have two main competences: on one hand the ability to gain knowledge about the community by field immersion and to develop empathic relations with its members; on the other hand to use design knowledge to design with and for the community, developing tools to enable the co-design of new solutions coherent with the context and allowing non-designers to apply their knowledge and professional skills to the issues discussed.

Looking at the Milanese context, and matching it with the project scenario and the people involved, it is possible to detect two main sub-communities to be involved in the design process: consumers, or, as Petrini (2005) refers to them, *co-producers* and producers. In general design solutions work on both side, having de-mediation as their objective and the multifunctionality of the farm as the strategy to achieve it. For instance, designing a local “food box delivery service” (a form of de-mediated selling) calls for the design of a logistic support system and requires the farmers to develop new competences and skills to manage the service (multifunctionality) collaboratively. Such a double-sided action is needed in order to create a good balance between the huge demand coming from the city, and the actual offering of fresh produce (Cantù, Simeone, 2011a).

This could have a positive impact on a region by adopting a “planning by project” (Manzini, 2010) or “acupunctural planning” (Jegou, Vincent, 2010) strategy, where many pinpoint initiatives (projects) are developed under the same framework project that provides the scenario for the overall place development.

A tool to design with and within the community: the Ideas Sharing Stall

In order to transform the scenario into real service projects the first tool *Feeding Milan* developed was the *Ideas Sharing Stall*, a place within the Milanese *Earth Market* where new solutions can be co-designed and tested with the local food community. The stall started as a window to enable discussion between designers, city dwellers and producers coming to the market, creating tangible connections between Feeding Milan and the people who would become the users of the services to be implemented.

As the project developed, the peculiar features of the farmers’ market showed it to be a suitable place for co-designing activities (Cantù, forthcoming). The market is a *multifunctional service*: a service where not only the managers offer various functions but also a place where other local actors find a chance to propose their services to the city dwellers, offering different opportunities for interaction and *co-experience* (Forlizzi, Battabee, 2004). This way the market fosters *per se* network creation between local actors, and community building through collaboration and knowledge sharing, thus creating a good environment for service design intervention.

In this context, in each 2011 edition of the market, designers proposed co-designing activities to define new service ideas and get feedback from the participants. Specifically, from the analysis of the single actions undertaken it emerged that these fell into two groups depending on their purpose:

On one hand, activities aiming to improve the market multifunctionality by creating *small-scale* working *experiences* (rapid prototypes), offered by invited guests or organizations within the market, with the purpose of creating new connections in the local network;

On the other hand, activities aimed at co-designing new collaborative service ideas in order to define new services to be implemented in the region, giving direction to the framework project.

In order to carry out these activities many specific tools have been developed since the *Ideas Sharing Stall* was opened. They are tools supporting the *strategic conversation* between the actors involved, and enabling city dwellers and producers to participate in the design process. They include mock-up communication material, surveys, storytelling and other forms of visualization helping to trigger people’s attention in the market, share knowledge on the object of discussion and collect feedback from potential users.

Adopting a CCD approach in such a context leads designers to achieve much more than just having co-design opportunities with the community. The stall enables the designers to become part of the farmers’ market and get in touch with the people, interacting informally with them and participating in their “life as a community”. Thus CCD becomes a fundamental learning tool for designers, helping them to empathize with the people they are designing with and for.

In this perspective the *Ideas Sharing Stall* is an important CCD tool throughout the period of *Feeding Milan*, where local connections and potential for design collaboration can be established within the community of farmers and city dwellers. The stall has proved to be the engine of the framework project, able to translate abstract ideas into concrete object for discussion, with a flywheel effect for the development of new de-mediated and collaborative services (Cantù, forthcoming).

The process of service prototyping: the Farmer’s Foodbox

As previously stated, *Feeding Milan* is a framework project consisting of several local projects. Each of them is designed to be self-sustainable in terms of management and economy. This means that designers are only the promoters of these projects: their role is to help the service to start up and then to leave it to the management of local players. Thus, local actors have to be involved in the design process from the beginning. To facilitate this task, a rapid prototyping approach is needed. Such an approach allows designers to get in touch with the communities (consumers, farmers and institutions...) by showing them the service-to-be and asking for their feedback in order to implement the most feasible solution. For this reason, in order to set up an efficient and effective service prototype, a multidisciplinary approach is needed: designers and technical expertise from other disciplines, end-users (consumers and/or farmers), and local entrepreneurs and social resources willing to invest in the service start up.

As anticipated in the previous paragraphs, each service idea is part of a design process that starts with a concept proposal to be discussed and co-designed with a larger community of potential users, local players and experts, becoming an object of discussion in the *Ideas Sharing Stall*. These steps are preparatory to a prototyping stage that tests the solution in the real

context of future implementation, for a limited period of time, and involves stakeholders that will run or use the service. In our experience, the process of prototyping a service includes the following activities:

Benchmarking evaluation: research on similar or complementary projects, helping to generate ideas for a local service solution. The twofold goal is to get inspiration from other experiences and avoid mistakes at the design stage of running the service. Moreover, an initial business plan is needed in order to have an overview of the resources, costs and general organization;

Lead-users interviews: involvement of the users of similar services, focusing on experiences, feelings and motivations that can influence the design of the solution;

Service actors and activation of resources: who is working on complementary topics or could be interested in the project? By answering this question, it is possible to list the actors by category, to start getting in touch with them and to adapt our service idea to the real necessities and characteristics of local players;

Service system development: using the typical tools of *service design* (e.g: system map, storyboards, activities boards, etc.) to develop the service idea and outline how the overall system will work and how the stakeholders involved will interact.

Run time test: a first implementation of the service in a limited period of time. Real users are called in to experiment the system, and all the design choices decided in the previous steps are verified and tested in the real context of implementation.

Service monitoring and re-designing: collecting feedback from the users during the run time test and sharing it with the farmers by developing an online survey and a peer-to-peer evaluation system. This helps both the designer and the producers to re-design a more efficient solution.

According to one of *Feeding Milan's* local projects, "*Veggies for the city*", which aims at providing the city with local fresh vegetables, designers are developing a solution to distribute produce from the local countryside: the Farmer's Foodbox. In order to do that, a co-designing activity supported by a rough service prototype was carried out, helping the city dwellers to indicate their preferences about a service of weekly and local food delivery.

Taking into account the results from this activity, the next step was to figure out a solution proposal and to discuss it with a community of expert users and the farmers involved. In the rapid prototyping stage, designers interviewed about 100 people. During the past 5 months the process of service prototyping was developed and a run-time test of 4 weeks was carried out in the city of Milan. The experimentation involved 3 producers from the Agricultural Park South Milan, 5 Proximity Points (Punti di Prossimità) and 60 users, for a total amount of 1 ton of vegetables moved into the city in 4 weeks.

Since *Feeding Milan* is an on-going research process, we can highlight some initial recommendations and guidelines that emerged from this first prototyping experience, which can lead the up-coming prototyping activities on new service ideas.

Identify the optimal fidelity level of the prototype, understanding what service features need to be tested first and what can be postponed until the final implementation stage.

Evaluate a minimum and maximum duration for the prototyping stage in order to allow the service's weaknesses and strengths to emerge, maintaining the costs as low as possible for the purpose of the prototype.

Provide educational and training meetings that involve the service stakeholders. The main aim is to show and share the roles of each player, the relationships between them and the conditions and mutual advantages of taking part in the service.

At the end of two testing stages, after almost one year since the beginning of the project, the multidisciplinary group made of designers, agronomists and ICT experts, came up with a final version of the service offering, that takes into account feedback from the run time tests, and sets up the overall working system for final implementation of the service in 2012. The result is a *service model* which provides service stakeholders (farmers, distributors and service management) with some regulations, advantages and the full description of their role. This document is enriched with schemes, visualisations and tools that help each stakeholder to better understand and fulfil their own tasks to make all the system working and keep the service quality, as it is offered to the customer.

Conclusion: Feeding Milan as a "Living Lab"

Certain features of *Feeding Milan* lead us to describe it as a sort of *Living Lab*: the collaborative nature of the services, designed to be run by the community itself; the deep involvement of the city dwellers and farmers in the design process from the beginning; the participation of the people in piloting the solutions in their everyday life; the networked nature of services, where the actors and resources are spread throughout the urban region, but well connected in order to trigger new forms of relationships.

Feeding Milan is a chance for designers to experiment new service ideas that feed the city with food, and its region with agricultural prosperity. Within a scenario of “City Supported Agriculture”, small, pinpoint initiatives are undertaken, so as to implement a new idea of direct relations and conviviality between the city and the peri-urban countryside. Such services are designed for and with the local communities; they involve city dwellers who decide to take part in the system as pilot users, and require their feedback in order to be improved and replicated throughout the urban fabric. Therefore, as shown in the picture below, the co-designing process involves a wider or narrower design community at different stages of service implementation: concept proposal; rapid prototyping; reshaping; concept discussion; service prototyping.

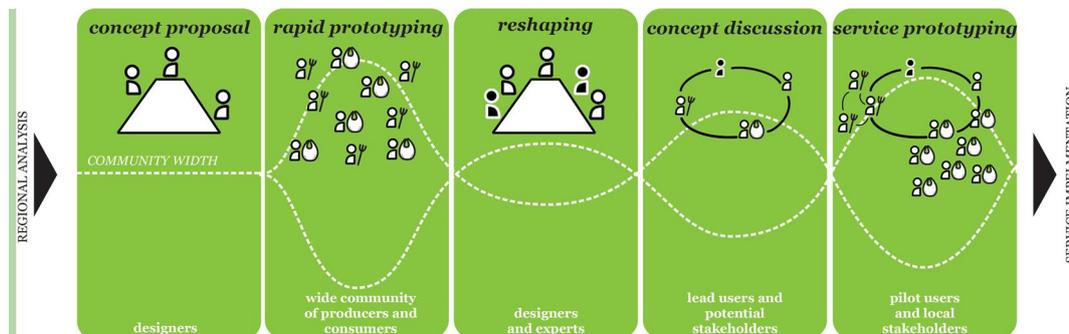


Figure 1 Community Centered Design process

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The Ethical Ecology of Service Design – An Explorative Study on Ethics in User Research for Service Design

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Abstract

Previous studies have shown that ethical situations within design currently present themselves as an implicit and non-reflexive activity. Others promote a development of ethical tools, which are incorporated within the normal set of methods, and tools used during the design process. However within the service design discipline ethical research has been scarce, some might even say lacking completely. In order to shine a light on the ethics within service design this paper explores the ethical design ecology of service design and gives a first sketch of an ethical baseline for the field. The data represents six weeks of shadowing in-house and external service design consultants working in Scandinavia, later to be analysed by the three major normative theories within ethics and an adoption of the Value-Sensitive design framework. The results demonstrate that service designers at the moment often approach ethical problems in an implicit and consequentialist way and that when ethical situations are dealt with explicitly they are often of a nature in which the consequences of the proposed design solution easily can be foreseen.

KEYWORDS: Service Design, Value-Sensitive Design, Normative Ethics, Ethical Ecology, Value-Sensitive Situations

Introduction

Since the introduction of participatory design (PD) in the late 1970s design disciplines such as interaction design, experience design and service design has emerged as strong contributors to the way of looking at how design contributes to society (Gladwell, 2000; Thackara, 2005; Löwgren and Stolterman, 2007; Junginger and Sangiorgi, 2009; Penin and Tonkinwise, 2009). Design disciplines with a methodology which has been influenced by that of PD (Holmlid, 2009). The new approaches have contributed to a shift in focus for the designer, making it more user-centric, i.e. focusing more on user involvement throughout the design process than before (Salvador and Mateas, 1997; Buxton, 2007; Holmlid, 2009). The user-centric shift has forced the ethical view on the design practice to change as well.

This paper focuses on situations that arise during “normal states” of the service design process. By “normal states” the author refers to states that have no specific ethical backdrop. Previous studies have shown that designers indeed find themselves in ethical and moral situations (van Gorp, 2007; Knight, 2008; Lloyd, 2009) and others have (implicitly) stated that these situations are influential when trying to understand the ethical design ecology in which the designer acts (Steen, 2011; Kirkegaard Rasmussen and Graves Petersen, 2011). Furthermore the ethics research conducted within other disciplines of design has shown that ethical situations are often dealt with implicitly (Lloyd, 2009) and others have called for a more reflexive process when it comes to ethical matters (Steen, 2011) and arguing for an ethical approach which focuses on ethics during the design process and not as a tool for judging whether a design is ethically good or not. Van Gorp (2007) on the other hand focused on different types of ethical situations, normal and radical, and concluded that designers tended to follow rules and regulations a lot more when confronted with a design problem of a normal ethical nature than when confronted with a radical problem. Taking previous research into consideration this paper supplies a first description, but not finished, of the ethical ecology within service design, exemplified from a stakeholder interaction point-of-view because of the user-centric view in service design (Stickdorn and Schneider, 2010).

Values and Design

According to Driver (2006) there are a great number of people who believe that what makes an action good or evil depends on the consequence of that particular action. For instance, the act of murdering someone is wrong because of its

consequence, death. This approach is called Consequentialism and in design this would mean that whatever intentions the designer had during the design process the good of the design is not decided until implemented and effects of it can be seen, i.e. the consequences of the design.

Another approach is the Deontological which Driver (2006) describes as believing what makes an act morally "right" or "wrong" is the act itself, and not the consequence of that act, i.e. it is a theory which defines "right" independently of the "good". A typical deontological situation within design would be choosing not to lie to a participant during data-collection in order to get "better" results, since that would fall under the case of "lying is wrong".

The third is that of Virtue Ethics, which build its theory on the notion that when contemplating moral dilemmas, and situations we first consider how we ought to be. We might even consider the virtue by someone we admire, one could for example ask themselves; what would Ghandi do? (Driver, 2006)

In design this would mean for instance that the designer would place him or herself within the shoes of a specific user in order to guide them through the design process. In the next subsection a framework for how values could be framed within design and Human Computer Interaction (HCI) is presented.

Values in Design

Values in design can present themselves in numerous of ways, depending on the perspective. There is a debate in the design ethics community on how to best approach the ethics within design (Bausch, 2008; Knight, 2008; Steen, 2011) and which normative theory to ground it within (d'Anjou, 2011). Consequentialism is a theory present in the design processes, something which sustainability design attests too (Fry, 2009).

Value-Sensitive Design (VSD) is described as *"...a theoretically grounded approach to the design of technology that accounts for human values in a principled and comprehensive manner throughout the design process"* (Friedman et al., 2002, pp. 1).

VSD uses three categories of approach to values; conceptual, empirical and technical. The conceptual investigation is a philosophically informed analysis of the central constructs and issues under investigation (Friedman, 1996). This category has for instance shown itself during creative parts of the design process when designers or design teams tries to get a comprehension of the design problem at hand in the data collected during this study. The empirical investigation encompass any human activity that can be observed, measured, or documented, hence most methods used in social science research, as represented in the collected data during user-interactions and during data-collection (Friedman, 1996). The technical investigation deals with that a given technology is more suitable for certain activities and more readily supports certain values while rendering other activities and values more difficult to realize (Friedman, 1996).

A typical example of VSD can be seen in the European Union's cookie-law introduced 2011. This law meant that the user got a more explicit take on whether or not websites could store cookies on their computer, before the law this information was "hidden" within the settings of most web browsers and now the user is prompted to say whether or not the specific website is allowed to store cookies on the user's computer. An ethical implication not unlike the one presented by Friedman et al. regarding cookies consent in the Mozilla web browser (Friedman et al., 2002).

Service Design and Ethics

Due to service designs co-creative nature and because it often deals with soft issues, just as PD, ethical situations are bound to emerge. By soft issues the author here refers to an issue which might be solved in a number of ways, none of them better than the other but still decisive for what happens in the future. Service Design is also a design perspective that deals with both local and global norms and values, which might force the designer to deal with contradicting values represented by society and different societal groups, as it does in PD where this often is used to better the empathy and understanding that the participants have of the other group. It also puts the spotlight on the designer to catch these norms and values and represent them during the design process, making the designer the voice *of* and *for* the people.

Service design is a design perspective relatively new and a perspective which is composed by a vast range of practitioners coming from other fields of design, such as; graphic design, interaction design, industrial design and experience design to mention a few (Stickdorn and Schneider, 2010). This vast number of contributors to service design not only gives the field a divergent approach to the design process itself but it also gives an indication that the common ground between practitioners might be a bit skewed, resonating to the ethical ground on which they stand on coming in to the field. Making it ever so important to find out what ethical views are represented within the field.

Method

The study was conducted over a period of six weeks at two locations in Scandinavia. The first a medium sized service company which employs a service designer, the second a service design consultancy firm. The method used for data gathering was the ethnographic approach of shadowing which allowed the observer to observe and ask the service designer questions regarding e.g. viewpoints during data collection. An adoption of the Value-Sensitive Design framework and the three major ethical normative theories were later used to analyse the data, see Figure 1 for analysis illustration.

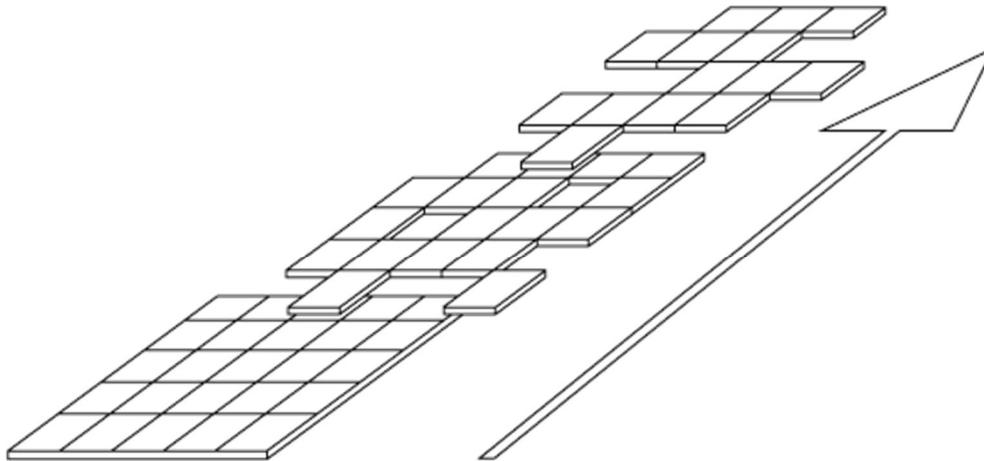


Figure 1 Visualisation of the analysis process.

In the lowest section all situations are represented. In the second all events identified by the VSD-framework and the third all situations identified by both the VSD-framework and the three ethical normative theories.

Results and Analysis

The standpoints of the service designers involved in the study reflect itself in the data by means of self-reflection on their part. At both locations the service designers rather see themselves as advocates for the user and their needs and do not bother or even want to be involved in the technical implementations of their design solutions. The procurer of the design job often shares this view, in the data their view is rather that the service designer's job is to research and inform them on what the users want or need. It should however be stated that this is the *intention* of the service designer (and procurer); situations where they are involved in the technical implementation process have emerged in the data. In those technical implementation situations the service designers still acts as an advocate for the user. This intended way of working has a direct effect on the ethical design ecology for the service designer since it limits/enables them to focus on one particular issue.

More often than not the service designers took on a consequentialist approach when thinking about their design. They often reflected upon their designs, during the conceptual stage in the process, as to what impact they would have on their user, how it would change their behavior, and if that behavior was sought after. If they did not know the answers to these questions they quickly reverted into an empirical standpoint and tried to figure out how to best get answers to their questions, and whom to talk to in order to get a valid response. The empirical category was the category which stood out the most in the data, not surprising since service design is a user-centric design discipline, and a lot of the activities which fell into the empirical category were goal oriented, i.e. consequentialist. As one service designer roughly stated it; we often know where we want to end up, my job is to figure out how to best get there.

Virtue Ethics was a category which was not as well represented as first can be hypothesized due to the intention of the service designers to be advocates for their users, for instance by the use of personas, customer journeys and other methods and tools for taking a user perspective. Very seldom did the service designers actually take the role of their users in order to help them make design decisions; it did happened, but not very often. Instead they often talked about and with the users as an outside group during meetings and workshops. They could themselves belong to the target-group and talk about their own experiences but still from an outside perspective. This is interesting because this not only enhances the consequentialist and deontological way of looking at ethical problems within service design but it also reaffirms the intention of the service designers to act as advocates for the users.

The deontological approach was often represented in the data when the service designers wanted to know when and how they could cut corners with their design. On occasion they asked a stakeholder during a meeting or workshop or when deciding on who to talk to and whom not to talk to. Another ethical situation which often arose after user-interactions were that of prioritizing user needs and figuring out which user needs to promote if contradicting ones emerged during user-interactions. Often the benefit of the many would win over the voices of few which attest to the consequentialist way of looking at a situation.

Steen (2011) identified designers as often talking about ethical problems in an implicit way and not as often in an explicit one. Which is true in this study as well, all of the above situations were of an implicit nature. The only time that values were talked about explicitly was when the service designers risked too design somebody out of a job or when data was represented as coming from point A when it really came from point B but represented as coming from point A. Situations where service designers risked designing somebody out of a job happened a couple of times during data collection and each situation had different results regarding viewpoints on how to best approach the subject. When the payoff for improving the user experience in the service delivery process was considered large enough the service designers tended to ignore the matter and said that it was not up to them to decide who lost or kept their job, however if the intended payoff was not considered large enough they were much more likely to opt for a solution which did not risk the persons job.

What these results show is that at the moment, service designers in Scandinavia often take a consequentialist approach during the service design process. They do this by setting goals and plotting a course on how to best get there by means of deciding on who to talk too and what to ask them about. From there a prioritizing of the user needs is conducted, during this part of the process both a consequentialist and a deontological approach can be taken by the designer depending on the situation. Finally all throughout the process the service designers see themselves as advocates for the users.

Discussion

There are a lot of ethical perspectives which designer can take when designing. One of the most talked about today is that of sustainability. How do designers of today adapt themselves to the situation in order to be able to look at the long term implications that their design might have on both the local and global community, which according to Fry (2009) very few do. However this is just one value perspective, of many, and it is up to the (service) design community to recognize that. There is imminent danger in only taking one perspective when designing (Hult et al., 2006), there needs to be a larger underlying process which fosters and aids the designers throughout the process and helps them identify key ethical perspectives (Steen, 2011). At the moment very few values are talked about and decided upon in an explicit manner within service design. There also needs to be an established framework on which these aids are grounded within (Fry, 2009). Designing just for sustainability, might hinder the designer and make them forget about other values that might be equally important to the end-user, ranging from human rights to family values. Previous work has shown that by actively taking new perspectives when designing the design process is enriched (Hult et al., 2006) which means that the ethical perspective is just one of many. What is important is however that each of them is represented in the process.

Tony Fry (2009) argues for a mentality of not adding something to the way we design but embedding it within the design process and having tools and methods where the designer by using these methods and tools *automatically* thinks these matters through. This paper contributes to that thinking by identifying ethical situations within service design and hence adding to the knowledge of where these tools can and should be used in future service design work. A first sketch for an ethical baseline of the ethical service design ecology has been drawn so that others, practitioners and researchers alike, can add and have their say on the matter.

The results show that ethical situations are seldom dealt with explicitly and often the values which the service designers represent are of an implicit nature, which raises the question of how aware the service designers actually are of the ethical service design ecology in which they work. Not by knowing that the service design field is a highly ethical discipline but rather how their choices will affect the lives of many. And by knowing which standpoint they have chosen which preconceived notions they bring with them before making a decision. However before being able to answer this question further research has to be conducted within the ethics area of service design.

Lloyd (2009) found that designers engage, both implicitly and explicitly, with ethical situations something which is apparent in this study as well. He studied engineers and architects during meetings whilst this study looked at service designers during their day-to-day work. This research hence adds to the knowledge about ethics in design and not only about ethics within service design since similar ways of approaching ethical situations within design between the two data-sets, an implicit approach, have been found. Furthermore Steen (2011) argues for a reflexive design process when it comes to ethical questions. That reflexivity can be found in some excerpts in the data collected in this study which shows that service design is a field which does work with reflexivity during the process however maybe not as much and formalized as intended by Steen (2011). He also argues for an ethical approach which focuses on ethics during the design process and not as a means of saying whether a design is ethically good or not, a point of view shared by the author of this paper. By combining the views of Fry (2009), Friedman (1996) and Steen (2011), i.e. implementing reflexive ethical thinking within already existing

methods and tools used (or if needed developing new ones) within service design and having a structured framework to map the ethical thinking towards the explicit ethical thinking which Lloyd (2009) talks about might be more apparent throughout not only the service design process but the design process in large. However the focus of the research presented in this paper is still the service design field and its way of working with ethical situations hence the larger discussion about an overarching ethical design approach will be left untouched in this paper.

Van Gorp's (2007) work puts the results in this paper in another perspective, his conclusion was that when designers are put in-front of a design problem with a normal ethical nature they are much more likely to follow rules and regulations than when confronted with a radical ethical design problem. This is an interesting point of view if you consider the goal of the paper, finding out how service designers work with ethical situations during their day-to-day work. The results put forth here should according to van Gorp (2007) hence illustrate an accurate picture of an ethical ecology within service design since none of the projects which occurred during data-collection were of a radical ethical nature. A baseline based on the data here could therefore be seen as a good starting point.

Conclusion

A short overview of a couple of situations regarding service design and ethics has been presented in order to create a baseline for the two in the future. It has been done from the perspectives of VSD and the three major ethical normative theories. The results show that empirical situations are a major factor when considering ethical situations and service design and that the most prominent viewpoint would be that of consequentialism due to the goal-oriented approach in service design. In the future, along with other possibilities, more ethically challenging projects would be the focus of study and a more comprehensive interview study of the results this research has yielded for other service designers to respond and think about.

The research also suggests a new look upon how to implement ethical thinking into the service design process by adopting the views of Fry (2009) and Friedman (1996) so that the views of Friedman (1996) are modified and embedded into the tools of service design in a manner which benefits all stakeholders.

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Emotions in design process. How to find an emotional touchpoint with the user

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Abstract

The main aim of this paper is to discuss the importance of the emotional connection between the designer and the user in user - centered design process.

In order to find an inspiration, enjoy the process of creating product/service, designers should find a way to people's minds and hearts. Different principles could be applied when dealing with the emotional state of users and designers: ethnographic approach reveals an understanding of the users by exploring their natural environment, empathy helps designers to understand how it feels like to be the user, share the same thoughts and feelings, and participatory approach brings users and designers at the same table to share their personal experience and find an important touch points through the enjoyable process of co-creation.

In this paper principles listed above will be discussed as well as their practical implementation based on the case "Design and Psychiatric Care".

KEYWORDS: emotions, ethnography, participatory design, empathy, psychiatric care

Introduction

Emotions are the engine of the whole design process. They help to find an inspiration, identify the aim of the process, establish relationships between team members, find a connection between design team and users/participants and enjoy the process and the outcome.

One of the aims of this paper is to explore emotional relationships between the user/participant of the design process and the design team. Designers represent their own emotions from the own perspective on the issues that they are interested in (Gho et al., 1993). They should find a way how to engage users into the design process and make it pleasurable, enjoyable, trustful, honest and meaningful.

The main challenge is to find the important touchpoint with the user and to make the whole design process an interesting journey for both parties. There has been a lot of discussion about the emotional design but that was mostly about the final outcome: emotional aspect of the product/service (Gho et al., 1993; Battarbee, 2004). The relationships between design team and the user have not been widely recognized.

This paper discusses the importance of the ethnographic practices as a facilitator to establish an emotional connection between the user/participant and the design team; represents the concept of the empathic design with the main emphasis on the designers personal experience in the design process; participatory design as a way how to engage user in the co-creation process.

Apart from the theoretical representation, this paper illustrates the case study of the User Inspired Design course dealing with the Psychiatric care in Finland. '365 Wellbeing' was a pilot project based on the User Inspired Design course at Aalto University School of Art and Design held in 2011. The main theme for the project was 'Design and Psychiatric care'.

The team of four students conducted a research and designed a web-based service related to the rehabilitation process of the mental health care system. The key points of the process as well as important touch points between users and designers will be described.

Emotions in design process

In this chapter several design principles will be presented as well as some techniques that could be used when searching for emotional connections between users and designers. Based on the theoretical explanation, practical implementation will be presented.

Ethnographic approach

Ethnography is a research method based on observing people in their natural environment rather than in a formal research setting. Ethnography informs design by revealing a deep understanding of people and how they make sense of their world. It provides design team with holistically study people's behaviors and experiences in daily life (Aiga, the professional association for design, 2011).

Ethnography allows design team to:

- Discover meaning. People have a need for meaning in their lives. Obviously, everything what is done should have a meaning as well as the process of creating product/service.
- Understand norms. Ethnography reveals the ways in which cultural norms shape people's perceptions. Make communications powerful.
- Things need to be understood. Ethnography helps us learn how to communicate more effectively with target audiences, in a language and way they really understand.
- Observe reality. What people say is not what they do. Ethnography highlights differences between what people perceive they do and what they actually do (Aiga, the professional association for design, 2011).

One of the common ways of gaining user's knowledge is observation. Observation is a tool that helps designers to understand what users really do. By exploring a broader set of activities, one gains deeper insight into user's life (Lockwood, 2010).

While using observation technique, designers could face several challenges. First, it is always hard to start. To get into someone's life requires a certain level of trust. Gaining trust seems to be one of the main challenges. When you trust with people, it speeds up the whole process.

There are three main guidelines for developing trust:

- participants (design team and user/other stakeholders) should share the same goal and vision;
- participants should have a free flow of information and easy access to it. Sharing of the information gives a certain level of the ownership;
- nobody is perfect. People tend to make mistakes and it is crucial to understand that mistakes could facilitate the whole process and help participants to go forward.

To speed up the whole process it is important to get to know people, know their interests and the way of working. Dealing with multidisciplinary teams (is it obvious that during the process design team will communicate with people from different backgrounds) requires some level of patience. For designers it is important to be open and a bit naive, have some curiosity and be passionate about the topic.

It is important to stay in touch with the people involved in the design process. Thus, participants feel that they are a part of the entire process and not just people who have been used for gaining some particular information.

Another important point that has to be considered is privacy. Participants of the process have to be sure that the information they provide will be used only for the research purposes and not be displayed outside the project's context.

When we started our research in the field of psychiatric care, the most difficult moment was to start. In order to have a powerful start, design team needs to find a valuable contact. And we found. In our case, Nurse was very supportive and active from the beginning and we immediately decided to have our first meeting. The first meeting is always painful for both sides: probably people see each other for the first time, talk to each other for the first time but additionally they have to share their own experience and let design team step into their own live.

Our team decided to keep only one person responsible for all the external virtual communication (telephone calls, e-mails) since it's easier for participants and helps to avoid misunderstanding and keep the whole communication process "clean".

On our first meeting we described the goal of the research and the whole process which made our interaction with the user open and transparent. Additionally, we promised to give participants ability to follow our research online and actively participate in creation and prototyping phase. That helped to show the importance of user involvement and gave people the certain level of ownership. Is it important to keep in mind that all the information which is shared is protected. Thus, participants are sure that information they are sharing is secure.

Personal contact is highly important in the design process since it helps to establish an emotional connection with the user. It was noticed that staff of the clinic is curious and fascinated that somebody (especially team of young people) decided to tackle such a serious topic. People are willing to tell about their work and personal experience if they see that somebody is interested in it and if they feel that they can help and change the situation.

Designer's role here is to show participants that they are at the core of the project and their participation is meaningful. It might be that users feel that motivation, openness and trust that design team provide and first checking whether they should trust or not. I would call it "waiting for a green light". In every design project there is that fine line when design team feel that they has gained that certain level of trust so they can start the research.

Applying ethnographic approach design team decided to concentrate on interviews and observations since these techniques were considered as the most effective due to the specific topic. Interviews helped to understand the people by establishing personal contact, seeing and listening to stories how people think and work, experiencing their work conditions and atmosphere. Observations helped to see and hear more precise what is going on: on the one hand, emphasize on details and on the other, to see the holistic picture.

Therefore, ethnographic approach helps to establish that invisible connection with the user, feel the atmosphere by being at the core of the research. Having an emotional contact with the user/participant it is important to be open, passionate (everything is interesting!), have an eagerness to learn, provide users with the security, and have an empathy with the them (Whalen, 2011).

Empathetic approach

Empathy is the intuitive ability to identify with other people's thoughts and feelings – their motivations, emotional and mental models, values, priorities, preferences, and inner conflicts (McDonagh, 2006).

Basically, it is based on the principle that a designer steps into the life of the user, wanders around for a while and then steps out of the life of the user with a deeper understanding of this user (Kouprie & Visser, 2009).

Empathic design could be considered as an imaginative projection into another person's situation (Koskinen et al., 2003), or a particular kind of imagination (Fulton Suri, 2003). These terms 'projection' and 'imagination' imply that being empathic is a range of activities where designers should imagine what it would be like for themselves to be (in the position of) the user.

Every individual has his or her own unique experiences and these define his or her empathic horizon. The term 'empathic horizon' (McDonagh-Philip et al, 1999) is used to indicate the limits on a designer's individual ability to empathize beyond certain characteristics of his or her group, such as nationality, background, age, gender, culture, experience and education.

Next to ability, the willingness of the designer plays a role. Design empathy requires direct and personal engagement and is dependent on the designer's willingness (Battarbee, 2004). One can think of the designer's personal connection with the user that motivates him (e.g. a special interest into the user group, because it is familiar to him), his emotional state that hinders him (e.g. tired, or a workshop at the end of the day) or his commitment to the project (e.g. how much the designer is responsible for the project) (Kouprie et al., 2009)

It could be very hard for designers to identify themselves with the user. Thus, it requires a certain emotional connection with the user and his or her emotional state. Usually, the best way to gain empathy is to be a part of the story which user could share with the design team. The combination of the real story and designer's perception of it could provide design team with new meaning and show the different perspective.

The right atmosphere plays an important role. Physical atmosphere could provide designers with very strong emotions and sensations. Being into the context/field provide designers with the rich insights and helps identify themselves with the user. Apart from the physical atmosphere, getting 'under the skin' requires an emotional state (and mood) of being able to get 'into the others people shoes'. In order to have a deeper understanding of the user designers have to leave their comfort zone and deal with the unknown environment and experience.

In case of the "Design and Psychiatric care" project identifying with the user was harder than expected. Hearing personal stories of people dealing with mental health problems, experiencing the atmosphere and trying to feel what users feel was tiring and exhausting. Design team went out of the comfort zone. For me it was hard to keep the motivation: on the one hand I was interested in getting to know other world I haven't seen before and trying to bring my own experience, but on the other, it was very hard to see people dealing with mental health problems and hearing their stories. Being strong enough to handle the topic, one of the main challenges in such kind of projects. Applying empathetic approach, a person has to feel like the patient/nurse feels, think the same way, behave the same way and imagine the same situations in order to achieve "emotional" touch points.

Empathetic design brings personal experience into the private context (Mattelmäki et al., 2002). The feeling of security, motivation and interest of the participants helped to gain a certain level of trust. Trust is a reflection of the success in every design project.

Empathic understanding goes beyond knowledge: when empathizing you do not judge, you relate to [the user] and understand the situations and why certain experiences are meaningful to these people (Battarbee, 2004), a relation that involves an emotional connection (Battarbee et al., 2005).

Participative approach

Participatory design represents a way in which users could be engaged into the design process. It helps to come up with different solutions based on users personal experience and help design team to identify the main opportunities.

Unlike other approaches to understanding users, participatory design assumes that users should play an active role in the creative process: users envision the future by identifying the defining moments from their perspective. These moments can highlight critical touch points and the desired feelings associated with them, which serve as a foundation for emotional connections.

The main aim of the participatory approach to design is to bring value into the design process by providing the relevant and timely information. In addition to that, participatory design help designers to identify touch-points with the user and gain valuable insights.

Participatory design could be conducted in different forms, The most common form is a workshop. Workshops help design team to identify real problems, explore possibilities and make the whole process playful, engaging and exiting. Usually, workshop consists of specific set of tasks that facilitate the process of gaining insights.

Exercises (tasks) can be developed to express cognitive, emotional, aspirational, and procedural issues. They can also be developed to enable the embodiment of ideas. In creating the exercise, both the choice of words and images and instructions for the exercise must be considered (Gage, 2011).

Emotional exercises tend to ask people to describe an experience and use words that describe feelings: careful, alert, relaxed, etc. The images are tend to show people expressing emotion or elements which tend to drive elicit these emotions.

By identifying the key moments in users desired experiences, emotions associated with those moments, and the specific components that can provide these feelings, a foundation for applying the processes of experience design is established. The team can begin to focus their creativity and expertise to design for the desired experience. Opportunities to make an emotional connection become clear, actionable, and inspirational (Gage, 2011).

For the "Design and Psychiatric care" project design team decided to choose co-creation workshop as the main tool for participatory design. User's observations as well as opportunity areas were presented to the clinics staff in order to gain relevant insights and compose the concept. Design team conducted several workshops. The goal was to make sure that ideas are relevant and could be developed into the concept together with the staff. Several exercises were created in order to evoke some personal experience and moments associated with the topics. Creating ideas together gave participants a feeling of ownership and provide an exiting experience of being able to change the way they work and have an impact. Excitement, inspiration, creativity - all these attributes should support every workshop in order to get people fully involved and help them to open themselves. Insights gained during the workshops helped to come up with the final concept.

Connecting on this level gives all participants a new level of trust and sometimes a feeling of friendship. Such a playful atmosphere and ability to see their own world from the different angle brings an understanding to both: designers to deeper their knowledge about the users's world and users to understand the way designers work.

At the end of the project, trying to find the best way to describe and present the final concept, team decided to use storytelling approach.

Stories have a strong influence on peoples feelings and emotions. They help to describe the whole concept clearly, with the emphasis on the emotional experience of the person dealing with the mental problems. The story was told by one of the team members as he was the patient. Empathy was at the core of the concept. The presentation got a lot of positive feedback related to the relevance of the concept and the way of presenting. It has had a strong influence not only on the people dealing with the Psychiatric care but also other designers participating in this course. After the presentation, team got a lot of cheerful, valuable and excellent comments about the final concept.

Thus, applying co-creative participatory approach gives both sides: designers and participants/users the feeling of ownership and motivation to bring their own experience in order to create something valuable together.

Conclusion

Emotions are an integral factor in people's behavior (Battarbee, 2004). They are the starting point for the every process. Thus, the way people think and perform is directly connected with their emotional state of being.

In order to find an inspiration, enjoy the process of creating product/service designers have to find a way to people's minds and hearts. In this paper several methods were illustrated. Among them are ethnographic approach which helps to analyze people's behavior and interact with them in their natural environment; empathetic principle which reflects designer's personal experience and emotions in the context of the research, and participatory approach which is supporting creative thinking of participants, helps them to express their feelings and thoughts while being a part of the team.

Furthermore, these methods were illustrated with the real case example based on the Used inspired Course "Design and Psychiatric Care".

Applying these methods gives designers an opportunity to find a touch points with the users, understand their motivation, gain a certain level of trust, and enjoy the process.

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Right Service & Service Right

How collaborating heterogeneous networks at the front end of service development benefit the process to get the service right.

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Abstract

The development of services is a process in which heterogeneous networks of organizations, designers, and customers collaborate. In this paper we argue that getting a service right at the end of such a development process will be easier when at the very beginning of the process already is started with a collaboration of these networks aiming at getting the right service. To get the right service the co-creation of value, and deployment of actual experiences of users as drivers for service innovation, are seen as important ingredients. This discussion is based on the findings in an on going project, with the aim to develop a framework for conceptualization and implementation of services. The collaborations are addressed from both the organization and design perspectives.

KEYWORDS: Product-Service Systems, networked collaboration, multi-perspective co-creation, co-creation of value.

Introduction

Industry is facing the challenge to transform their tradition of mass-producing and mass-marketing products. Offering products is not longer enough to be competitive, just adding features or finding new target groups doesn't work anymore in the growing complexity in society. Offering products is extended to the offering of combinations of products and services: Product-Service Systems (PSS). Manzini, Vezzoli and Clark (2001) outline the potential of the concept of PSS to shift production and consumption patterns into more sustainable patterns. PSS development could make industry look for products and services jointly capable of fulfilling a client's needs and/or wants - with higher added value and a smaller environmental impact as compared to an existing system or product.

Products and services differ in a number of ways. The main implication of those differences is that services, as opposed to products, rely on the interactions between the users and providers of the service. This has consequences for the development process since all aspects relevant to these interactions (e.g. product, brand, customer-facing staff, environments, sales and communications materials and channels) have to be jointly developed (EngineGroup).

Product development is already a complex process because of all parties involved. However in the case of development of PSS often networks of Small and Medium Enterprises (SMEs) and/or departments of larger organizations collaborate with their customers who are networked as well. Gummesson (2004) explains that because of all these networks (of organizations, customers, citizens, and of employees) the communication of organizations with their customers has changed from one-to-one to many-to-many.

It can be said that PSS development is a heterogeneous networked collaboration.

The authors of this paper are part of a recently started project focused at understanding the networked nature of PSS development. The project aims to develop a framework of methods, techniques and tools that improves the conceptualization and communication among all those involved in design and development, across industries. The project is described in Henze Mulder and Stappers (2011) where it is argued that the user's experience serves as the central instrument to orchestrate the complexities of Product Service networks. A user-centred focus promotes outcomes that fit the needs of the user and could improve communication and collaboration among the multi perspective parties involved. The focus of the current project is on how to develop product-service systems in heterogeneous networks. The project team is a heterogeneous network in itself because of the expertise of the project partners (academic and industrial professionals from various disciplinary backgrounds among others such as industrial design, change management, software and service engineering, human-centred design, organizational development, product development, service design, business strategy, networked collaboration). All team members participate in all activities throughout the project, joining and confronting their experience, knowledge, and skills and enabling them to look beyond traditional paradigms. The activities concern case studies that give the opportunity using retrospective analyses and interventions, during which both theory and application evolve in parallel. A variety of application areas are researched in the project (health care services, financial services, document services and ICT services).

A first attempt to draw the map of Product-Service Networks and their collaborations has lead to the initial framework in figure 1. The diagram shows collaborations between provider organizations (in the Service Organization Network), in between designers (in the Service Design Network) and in between the people using and experiencing the PSS (in the Service Experience Network). An emphasis lies on the collaboration of these networks (the overlapping fields in the initial framework)

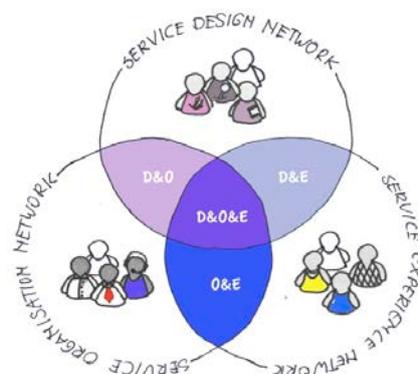


Figure 1: The initial Product-Service Networks framework stresses the interactions on the boundaries of the networks.

A first question is what methods, techniques and tools are available to enhance the collaborations and lead to the mix of products and services that meets the needs, values and ambitions of the people using and experiencing the PSS?

The collaborations are addressed from both the organizational and design perspectives.

Two of the findings in the first phase of the current project are reflected upon in this paper:

1. It was concluded that a paradigm shift towards cooperation seems required: instead of cooperation in order to meet individual targets cooperation should be based on a balance between users value, organizations value, and service systems value. This is in keeping with Parker and Heapy (2006) who stress a similar approach where it is less about competition and contestability. They stress there is a need for a vision (public) services that put people and places instead of targets and key performance indicators at its heart.
2. A main challenge seems to be deploying actual experiences of users as drivers for service transformations.

The balance among users value, organizations value, and service systems value is discussed from the organization and design perspective in section 2 of this paper on the co-creation of users value and value for organizations. In section 3 deploying actual experiences of users as drivers for service transformations is discussed. One of the cases, retrospectively reviewed in the project, is used as an illustration how this deployment could lead to co-creation of the right service.

Co-creation of value

Much has been written on co-creation and on creation of value. For the purpose of this paper co-creation is referred to as the act of collective creativity of people working together in the product-service development process. Sanders and Stappers (2008) reflect upon co-creation and co-design from the design perspective. They discuss the consequences of the evolution from a user-centred approach to co-creation for the design practice, and one of their conclusions is that new tools and methods will be required for researching and designing.

Ramaswamy (2009) discusses co-creation from an organization perspective and feels that co-creation always begins inside the organization. Co-creation is changing the very nature of engagement and relationship between the institution of management and its employees, and between them and co-creators of value – customers, stakeholders, partners or other employees. Organizations have been designed around their internal activities and have to develop the capacity to co-create (Ramaswamy, 2009).

As a next step, co-creative strategy can be summarized as creating value by enhancing experiences of all stakeholders, focussing on the interest of all stakeholders, and achieving advantage through the increased engagement of stakeholders and by continually building

new interactions and experiences, which lead to higher productivity, higher creativity, and lower costs and risks (Ramaswamy and Gouillart, 2010).

Ramaswamy and Gouillart (2010) advocate 4 principles of co-creation: value for all stakeholders, focus on experience of all stakeholders, stakeholders interacting directly, and provide platforms for interaction.

To put it differently: PSS development from the organization perspective seems to be about co-creating value in a heterogeneous networked collaboration, and seems to begin in adapting the organization. From the design perspective the emphasis seems to be on the collaboration of users and designers. In this, the terms co-creation and values are central terms, which are used loosely by some authors, and better defined by others.

Co-creation of value: the organization perspective

Vargo and Lusch (2004) promote a new dominant logic for marketing, one in which service provision rather than goods are fundamental to economic exchange. One of their premises is that goods are a distribution mechanism for service provision. From the marketing perspective, in relation to PSS and value co-creation, Grönroos (2011, forthcoming) says that being a service business is a strategic choice and a function of the dominating mental model in the organization ('culture'). To his accordance service is to facilitate and support another party's practices in a way that helps this other party achieve its goals in life or business. He thoroughly discusses the Service Dominant Logic of Vargo and Lusch (2008), especially their premise that the customer is always a co-creator of value. The starting point of Grönroos is that the customer's value is always value-in-use. Value-in-use is the value creation by customers during their usage of products and services. Design and production may influence and engage with this value creation process (Grönroos, 2011). Grönroos concludes that provider organizations cannot create value for their customer, but they are value facilitators. Based on that he explains that co-creating value is not possible without direct interactions. Only when direct interactions occur the provider organization has an opportunity to co-create with its customers.

But also co-creation of value between organizations takes place. Den Ouden and Valkenburg (2011) explain that for collaborative social innovation it is needed that the various participating companies and organizations get insight in, and create, their shared value. This value is defined in different terms e.g. economical value, knowledge and reputation. A first step in the collaborative innovation process Den Ouden and Valkenburg (2011) suggest is defining a suitable value proposition for future needs of the users. In the adaption of this proposition new value propositions arise for the participating organizations and need to be defined in the early phase of the innovation process. These new value propositions often require reconsidering the current business model and context.

For the purpose of this paper co-creation of value refers to the creation of value propositions in close collaboration (direct interaction) between (networks) of organizations and (networks) of customers, adapting the theory of Grönroos of value-in-use and the customer as the value-creator. This co-creation of value starts with the creation of value propositions in the earliest stages of the PSS development process in order to enhance the collaboration between the different networks.

Co-creation of value: the design perspective

Looking at the co-creation of value from the design perspective the concept of Design Thinking is key. According to Brown (2008) design thinkers are people that have a designers' sensibility and use methods to match users' needs with what is technologically feasible and what with a viable business strategy can convert into customer value and market opportunity. Brown (2008), and many designers with him, believes that business would do well to incorporate design thinking into their innovation process. In contrast to the organization perspective it seems that designers take the user as the starting point of innovation.

Stickdorn and Schneider (2010) apply this design thinking to service design. The service design process is sketched here in 4 stages: Exploration, Creation, Reflection and Implementation. The Exploration stage is very much an understanding of the state of the art (what are the company's culture, goals and view, what are the consumer's problems). The Creation stage focuses on the enjoyable experiences before, during and after the central service experience. In the Reflection and Implementation stage the service concepts are tested and implemented. What seems missing is the notice of the network relations and a direct interaction between customers and organization to the co-creation of the PSS vision and value propositions. Kimbell (2011) proposes a process of enquiry during which meaning is constructed with diverse stakeholders in the service design process. Kimbell (2011) sees service as the fundamental basis of creating value. In her research, design practitioners indicate they facilitate the involvement of managers, customers, service personnel and other stakeholders. The understanding and facilitation of networked collaboration is not mentioned.

Lu, Keijzers and Dorst (2011) explore the use of tangible value modelling to motivate stakeholders to participate in multi-stakeholder innovation. They make a link to the tangible business model sketches from Mitchell and Buur (2010). These sketches are to stimulate discussions concerning how businesses create and capture value and include professionals (like designers), who do not understand the language and logics in business models, in these discussions. Both tangible value modelling and tangible business model sketches seem to be promising attempts that could facilitate co-creation of value.

The examples in this section show how/that the co-creation of value from the design perspective refers to the creation of services and business models. Service design is about creating value for both customers and organizations by facilitating the development and design of valuable propositions for customers and organizations. Understanding customers, designing services and facilitating organizations in developing their business models is what (service) designers do. Methods for facilitating collaboration of heterogeneous networks seem still under construction.

In the next section we elaborate on the deployment of experiences of users as drivers for service transformations. The emphasis is on collaboration of all PSS networks at the very beginning of the co-creation process.

Co-creating the right service

Co-creation in the very beginning of the PSS development makes it possible to deploy actual experiences of users as drivers for service transformations. However, only when a clear vision of the right service is taken as a starting point it will lead to detailed solutions for each point of contact between the user and the service provider that make the service right. We refer to the right service in this paper as: the best fit between the facilitating possibilities of the organisation and needs and goals of the customers. This in keeping with the definition of service of Grönroos (2011).

The following ‘case of the Insurance Company’ (one of the retrospective cases in the project) illustrates collaboration among customer networks, designers’ networks and organization networks. We use this case as an illustration because it is an example of a development process with the potential of the joint development of user network centred services and the development of the new business model (required to facilitate networked collaboration).

The case of the Insurance Company

In 2007 a cooperative Insurance Company agreed to invest in ‘Social Innovation’ for a period of 3 years. Four C, a ‘Social Innovation’ consultancy, would support the Insurance Company during this period and commit itself to deliver innovative concepts that would precisely fit the context of use by the end customers. The key concept of Social Innovation (SI) is the focus on the users, and how they perceive value within their context, interests, needs and experience.

The Insurance Company selected the small and medium enterprises, exemplified by restaurant owners, as the end customers the innovative concepts should fit.

The first step in this project was discovering, analysing and understanding customers’ needs. The outcome of these qualitative & quantitative customer research determined restaurant owners all worked closely together with a network of local entrepreneurs often consisting of local greengrocer’s shops, bakery, butchers, carpenters, painters, book keepers, carriers, cleaners, etc. Looking from the perspective of restaurant owners, their business goals and their ultimate commercial success depended more on cooperating with their local network of entrepreneurs than on the Insurance products and services. So, focusing only on Insurance products and services would not have been a clever decision, since it was calculated that restaurant owners paid 3 times more for their toilet paper than they would pay for Insurance products. Insurance products were not at their priority list, at all! It was more adequate to examine, understand and enforce the existing relationships among these local networks to discover which role risk-related products play in the networks of local small businesses.

In the following stage Four C collaborated with their designers’ network to facilitate context mapping and co-creation sessions to understand the latent en implicit desires of the customers (see also Visser, Stappers, Van der Lugt and Sanders (2005)).

One of the outcomes was a target for the Insurance Company: 75% of the questions the customers asked the Insurance Company, would be answered within 24 hours. This simply expressed the frustration many customers experienced with any ordinary Insurance Company.

Within the Insurance Company the customers are attracted by the Marketing departments, the product is ultimately sold by the Sales department, the commercial balance in results of sales volume and the expenses (for instance as a result of damage) is the responsibility of the Portfolio management department, the claims are handled by Claims department and finally when a damage has occurred, the Damage department sends specialists to recover the damage. These departments do work together occasionally, but based on other parameters subjected to internal politics and individual interests, for different reasons than to satisfy the need of the customers.

Consequently, Four C requested both the insurance specialists, and the management of the Insurance Company, which set of competencies, skills, data, software, process, etc. would be needed to reach the target. The answer was a complete new business in which specialists of several departments would closely work together to answer the customers' questions.

Everybody who knows the complexity of the personnel management, budgeting, IT, data warehousing, business processes, etc. of Insurance business knows that this would be a lost battle, before it has even started. So, the concept of the mini-company was created as a first step towards the final goal. Management agreed upon a pilot to put the required Insurance specialists in a team for a half a day each week who could answer the customer questions by cooperating as a team working for the same client groups. A team consisting of consultants, data specialists and designers facilitated the cooperation between these internal (mini-company) and external (client groups) networks.

The complex problem within the Insurance Company (like any large company) is that specialists are managed, their outputs are coordinated, and targets are defined from an efficiency and cost perspective by their department manager. Within this model, the manager 'owns' the output of one specific 'link in a chain' that is needed to answer/fulfil the entire question/need of the customers. We discovered two things: firstly a cooperative team of specialists from several departments within the Insurance Company was needed. Secondly, and that was even more challenging, we discovered that it would maximally motivate the specialists to coordinate the outcomes when they themselves (and not the manager of the team) would own the mini-company! In this way we were able to put a social mechanism in place that would value the specialists who are the best in helping the clients. The results of this first step of the mini-company concept were unexpectedly good, both for the customers' satisfaction and organizational results as well as the cooperation within the Insurance organization.

Where the clients' team builds relations between customers with the same needs by co-creation sessions, the mini-company builds relationships between specialists on the base of insights in customers' needs, derived from the outcome of the clients' team. In the further development of the concepts the clients' team was involved in testing the different concepts (interfaces) while the mini-company worked on the business model.

Before all innovative concepts were implemented and could proof the benefits of Social Innovation, the budget for the entire Social Innovation trajectory was suddenly stopped, as the financial crisis was affecting the economy in the beginning of 2009. Management did what they often do in case of crises: cost cutting instead of further investment in innovation. The SI team, and their designers' network, did not succeed in convincing management to continue investments in the Social Innovation.

Lessons learned from this case

Old institutional habits are difficult to change, especially in the case of emergency as a financial crisis. Management use their existing value propositions to decide on investments in PSS development and developing new business models and context. The co-creation and application of new value propositions seem difficult, apparently because of the lack of methods and designers' skills to collaborate with executives and management in the co-creation of a shared vision for a PSS proposition and in the end bring that vision into action. Measuring the benefits of the new value propositions is proven difficult in this case on the relatively short (14 months) notice.

Building relationships among the different networks seem possible and beneficial in the co-creation process of the PSS in this case. The clients' team, the mini-company and the collaboration between the two showed this.

The new collaborative business model designed for the Insurance Company, which was experimented successfully for the SME client groups, was based on a simple strategy called Tit-For-Tat (Axelrod, 1987). The Insurance Company would initially choose an Internet strategy for building relationship with client groups, as Internet is a very cost efficient distribution channel. As we experienced the importance of social contact among local entrepreneurs, which is the base of doing business with each other, we realized that doing business requires both, easy to access platform (internet) and it also depends crucially on the probability that local entrepreneurs (SME's) will meet again. This last aspect came forward as the most significant parameter for the local SME's to trust each other and do business with each other.

Conclusions

In this paper, within the context of the current project on developing a framework for service development, we discussed the co-creation with customers at the very beginning of the development process in order to formulate a shared vision for a PSS proposition. The co-creation of value, where the consumer is the creator of value and the provider organization is the facilitator of values (Grönroos, 2011), starts with understanding the future needs of the customers (Den Ouden and Valkenburg, 2011). The co-creation activity in the front end will build relationships in and between the heterogeneous networks, important for the further development of the right service into the right service outcomes.

However, we learned from the case of the Insurance Company that designers seem to lack methods and skills in co-creating with executives and management in the organizations networks necessary to create a shared vision and bring this vision into action. From the design perspective there is a low attention on the understanding and facilitation of networked collaboration. Methods for facilitating collaboration of heterogeneous networks seem still under construction.

Limitation of this study is that the findings are based on only one case, a limited literature review and several project team workshops. We are only at the beginning of a journey that will be continued the coming 3 years with further research through design, case studies and literature study. At the end of the journey we have not only developed a framework of methods, techniques and tools to enhance the collaboration of heterogeneous networks, improve conceptualization and communication of PSSs, but also reached a consistent link between theory, skills and practice.

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The first case experience of designing for service

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Abstract

In order to build a strong foundation for design for service there is a need to develop good courses, modules, and perhaps programs in service design. Regardless of the scope of such teaching, somewhere the students start learning about service design and start learning to do design for service. The first case experience sets the scene for how students view service design, and the opportunities they see in applying design to services. For a long time we used a simple example, to introduce design for service, the tire-changing service. When we turned this example into the first case for the students to work with themselves, it did not work very well. Based on this experience and research in service design, we defined a set of criteria that would help us judge whether a case would be a good first case or not.

In this paper we present the criteria used, a short review of three possible cases, and the case we have chose to use as the first case experience. We also analyze shortcomings of the case, and possible future developments.

KEYWORDS: teaching, service design, case, learning, flower shop, flower delivery, tire-changing, judgment criteria

Introduction

One challenge teaching service design is to find a good first case for the students to work with. Finding any case is not hard, but it might not be beneficial for the students. A good first case needs to be simple to approach, but give several opportunities to work with different aspects and challenges of service design. As service design spans from social innovations over human intensive services to after-market services, the selection is wide, but nonetheless difficult to make. The three perspectives defined by Sangiorgi (2009), interactions, complexity and transformation, would be beneficial if they could be observed and worked with in a case, but as such they don't help in finding a case. At its core service design can be seen as being concerned with designing opportunities to co-create value (Vargo & Lusch, 2008; Holmlid, 2010), but finding a case based only on this assumption is a paramount task.

The first case experience for students is important in several ways, e.g. when giving a service design course. Together with initial reading and introductory seminars or lectures, it works as an advance organizer (see e.g. Ausubel, Novak & Hanesian; 1978). An advance organizer often summarizes several of the important aspects of the learning that will come. The first case also works as scaffolding, whether the teacher wants it or not. That is, it gives the students an experience of working with something that they believe they do not master yet, stretching their Zone of Proximal Development (Vygotsky, 1978). That is, if the first case is too simple, or matches competences students already believe they have, the students will think that the course is easier than it might be, or believe they already know how to do design for service. Moreover, in education systems where students switch courses in the beginning of semesters, it also works as an interest keeper or eye opener, and as the experience the students will talk about among themselves.

This paper reports on the considerations made in rejecting, selecting and creating such a first case.

The starting point

For a long time the first example we presented when talking about what service design is, and the value of working with design of services, was the tire-changing company. In its straightforwardness and simplicity it was similar to the classical shoe-shine shop example (Shostack, 1984), and therefore easy to explain, and quick to grasp.

In most parts of Scandinavia as a car owner you need to change tires depending on season, and this is a huge seasonal business opportunity. It is a well known service, and there are several variations, but most of them are really only about changing tires and selling new tires. As an example this worked nicely. Most people can relate to the service, and some might have tried to change tires themselves.

But, as a first case to work with we experienced some frictions. The main problem seemed to be that the service was not complex enough, and that variations of the service seemed to be too few, until they became strange. The base line often was a service where the car owner books an appointment for changing tires, and makes on the spot decisions whether there is a need for new tires or not. Quickly a set of variations emerge, among those

- » the tire changing shop reminds car owners, that signed up for a mailing list, that it is time to change tires,
- » the shop owner picks up the car at the owners working place, or
- » the tire changing shop is placed in a popular parking space

Other variations then emerge, among those

- » the shop is turned into a tire hotel, where the car owners stores their tires
- » the shop issues a guarantee that the car owner always will have tires with enough depth

After that, variations seem to take a wild turn, among those

- » the tires are stored in automatic storage rooms, turned every 15 minutes
- » in the tire hotel each car owner can access a live footage of their tires to see how they are

As variations around the tire changing service these are interesting, but they don't lead development of knowledge and understanding on design for service.

Developing criteria for the future case

Based on the experience of turning the example into a working case we listed a set of criteria to use in order to judge new ideas for cases. The criteria were generated based on our own experience from the learning situations, and from research in design for service. Apart from research literature reviewed in Blomkvist, Holmlid & Segelström (2010), including literature until 2009, we used earlier and later research sources, as well as other sources (such as Parker & Heapy, 2006; Sangiorgi & Clark, 2004; Sparagen & Chan, 2008; Diana et al, 2009; Jung et al, 2009; Junginger & Sangiorgi, 2009; Kimbell, 2009; Blomkvist, 2009; Segelström &

Holmlid, 2009; Pacenti & Sangiorgi, 2010;). The criteria were of two kinds; criteria to avoid and criteria to look for. These criteria were later used to judge other suggested cases.

Criteria to avoid

Too shallow degree of complexity; the tire changing service is a low-complexity service. It is fairly similar to the classical shoe-shine-shop example used in early writings on blueprinting. It may of course be designed with a high degree of complexity, which could be an interesting design exercise.

Too simple layered relationships; the tire changing service carries few relationships and these are structured fairly simple across the layers of the service. The case thus gives few opportunities to deal with issues of relationships in a service.

New solutions quickly become strange; when trying to come up with redesigns for a tire-changing company the space for meaningful redesigns is fairly small. It is fairly easy to suggest tire-hotels, and adding services such as that the tire changing company keeps track of the health of the tires and suggests when new ones need to be bought, etc. But after these, ideas such as web-video of your tires when they are at the tire-hotel, just are plain strange.

Criteria to look for

When it comes to the criteria to look for, these were generated from attributes that we believed were good with the tire changing example, and attributes we lacked in that example.

Need; the service should be one with a clear need, that is solved through the service. It should also be a service that some might choose to carry out themselves, and that many people have a need for.

Complexity; the service should carry some degree of complexity, on the surface as well as in its deeper structure

Systemic; the service should have a systemic nature, with relationships in layers, with people, places, resources, transports, etc. The service should possibly stretch over the Product-Service System scale.

Easy to engage with; it should be a service that people have had a personal experience with, and where the service concept is easy to understand. On the surface the service should look trivial, and emotional values should be directly accessible.

Accessible for studies; it should be a service many people have experienced, and it should be easy to find a service for possible field-studies.

The inclusiveness, size and credibility of the design space; new and interesting solutions should be easy to come up with, and should not only include IT-solutions, but also alternative ways of interacting, new ways of distributing work and resources, etc.

Understandable support tools and processes; there should not be required too much expertise knowledge and organizational knowledge to think about support tools, nor too advanced technological tool or too much complexity in infrastructures behind the service.

Usage of service design tools; the traditional service design tools should be easy to use on the case, but it should not be tailored to these only but allow for introduction and usage of new tools.

And, as a final criterion, we wanted the case to be **scalable** and **modular** in terms of teaching. That is, it should be possible to develop different exercises around the case, in order to scaffold learning of traditional as well as emerging concepts, models, techniques and methods in design for service.

Developing the case

While searching for the new case a set of ideas were reviewed. To get a large overview we looked at cases from earlier research (e.g. Pacenti et al, 2010; Vanstone & Winhall, 2006). We used a structured divergence technique over service situations, starting from a selection of the design contexts used as studio themes for our earlier design master program. The contexts from the design master program were, children, health, strategy, service, interactivity. In the divergence work we chose to work with the three first.

Quite a few service situations were generated, among those day-care center, emergency ward, home healthcare, lunch service for homeless, clothes exchange service, build your own toy, museum, networks for training, the flower shop, parking service, library, health hotel, farmers market, etc.

Some of these will be reviewed in more detail here, bear in mind that they are judged based on the idea that they will be used as the first case students are going to work with. Several of these are really interesting as teaching cases, but maybe not as the first case.

A health-care situation

A lot of us have some experience of a health care situation. And most of us have experience from both good and less good situations. There are several examples in the service design area to look at (Murray, Burns, Vanstone & Winhall, 2006; Janae-Leoniak, 2009; Blomkvist & Holmlid, 2011, Kolterjahn, Adolfsson, Holmlid 2009a, 2009b; Szebeko, 2011). Moreover, these situations don't show any of the criteria to avoid; there is complexity, new ideas don't get silly at once, and there are several layers. But, on the other hand, the complexity might be too large for beginners, in terms of understanding nuances between different organizations collaborating and possible power-structures within organizations. There is also quite a lot that students need to assume, regarding processes, tools, and what kind of resource and knowledge that is needed in certain stages of a health-care service. Roles and knowledge usage within health-care organisations are bounded by layers, rules and regulation.

The library

In a course called "design and research" we gave 2004 a library was used as the venue for using design as a method for research. This worked well, the students came up with ideas ranging from fully automatised libraries to libraries as a place to meet. Based on this experience, we judge the library to consist of too thick and rich infrastructure, and new solutions often get overwhelmed by IT-based solutions.

The parking space

The parking space is an interesting venue for service. It is a service motivated by the usage of cars, the access to other services such as shopping, and structured partly by the planning of cities. A lot is known about the different ways a parking lot can be designed, down to the efficiency of the angles in which cars are parked. In a project run together with a car park operator and a service design consultancy the design of parking experiences were explored (Wreiner et al, 2009). The experiences from this project was that the actual user experience of the parking service is very short, 10-15 minutes, and unless one wants to work with add-on services the service is too simple. Moreover, the parking service is mainly a support service, and it is difficult to argue that parking should be the main service, so the design space is quite limited. Despite this it has an interesting business model that is fairly complex, with a network of actors co-creating the parking value for the customers.

So, even though several of the generated case ideas are good and interesting cases, with a lot of interesting design aspects, we judge them to be less good for a first case experience of designing for service.

The flower shop case

After reviewing the cases we settled for the flower shop case. And narrowed it down to one of services that a typical flower shop mediates for their customers; delivering flowers to someone's door. The short-hand for the case is "you have a flower shop that helps customers to deliver flowers to the door of someone".

The service exposes a clear *need*, that many people seem to have, and you could choose to perform it yourself, from picking flowers to standing outside the door. It is a service of *moderate complexity*, in the interactions there is a set of decisions to be made and a range of information that needs to be transferred. IN the deeper structures there is some complexity, with some organizations co-creating the service, with branding issues, and with the fact that there are two different customers; the buyer and the receiver. The service is *systemic*, that is, there are relationships across layers of the service, that should be viewed from a systemic perspective rather than from the singular points of view. It also uses products, services as well as systems in order to work well. A lot of people have *engaged with* a flower shop delivering flowers at some point in time, and the service can be viewed as one where emotional values are at the core of the existence of the service. It is a service that is *easy to access*. There are flower shops all over the place for direct field studies, and because most people have used it, it is easy to find people to talk to, co-design with and observe. The *design space is fairly large and varied*, new business models can be designed as well as the details of interactions, there is room for increased human dependency as well as more IT-based solutions. And it takes several stages of frame-shifting design to induce silly design ideas. Even though several of the support processes are highly seasonal and heavy on logistics and synchronization, the *support tools and processes seem to be understandable enough*, without becoming overly simplified. The traditional *service design tools* are easily used on the case, and it seems as if allows for new methods to be tried out.

Context for and exercises on the case

The students have been given an introduction to what service and service design is, and some techniques have been described in order to prepare them to work with the case. The traditional techniques described have been service blueprint, customer journey and actor maps. Together with these techniques basic concepts such as touchpoints, evidence, onstage and backstage has been introduced.

The first exercise, for the students, has been to describe an existing flower delivery service based on a flower shop using a blueprint as the main aid to do that (see Figure 1). Following that their task has been to reframe the blueprint as a customer journey, and an actor map.

As a second exercise the students are supposed to develop a new service offer represented as a service concept, potentially new actor maps, service blueprints and customer journeys.

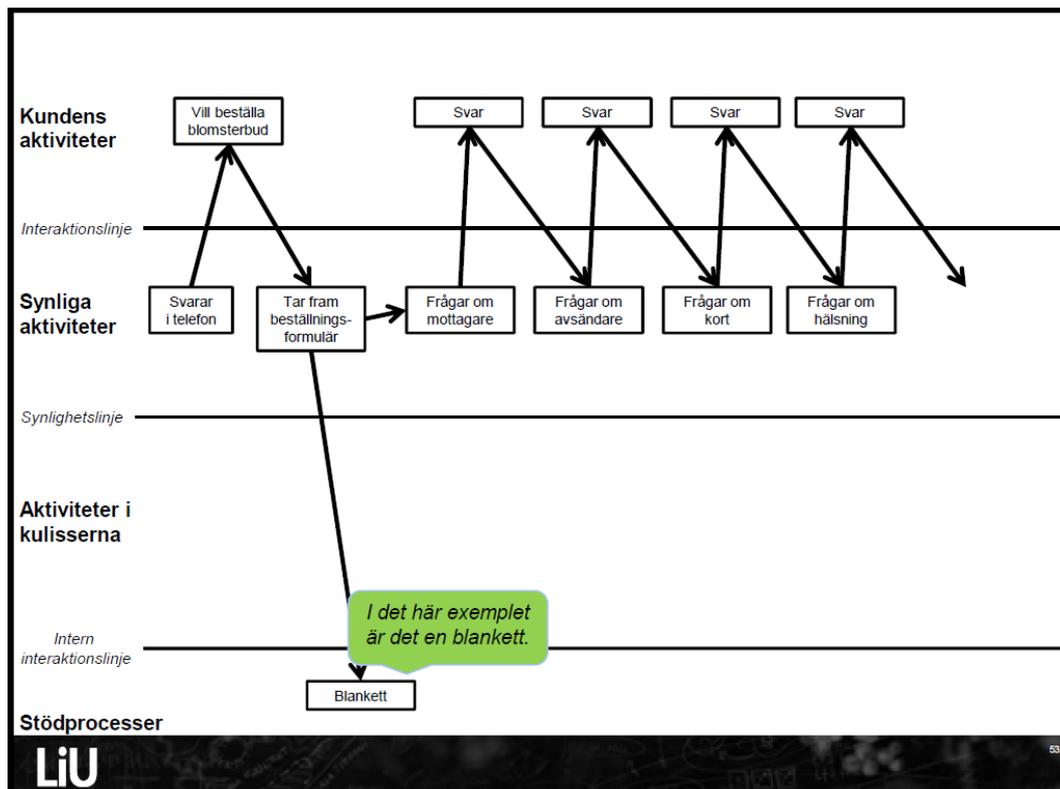


Figure 1 Part of a blueprint from the flower shop case

In some occasions we have required that the students work with newer or advanced techniques such as structuring and sequencing their service with service ellipsis (Holmlid, 2011), touchpoint cards (Clatworthy 2009), enactments (Holmlid & Evenson, 2007) or emotional mapping.

Scope of usage

We have used the flower shop case in several different teaching situations (Aalto university, AHO in Oslo, Konstfack in Stockholm, Linköpings universitet, and HDK in Gothenburg); with design students, with economy students, with engineering students, with cognitive science students, as well as with SME entrepreneurs in the service business. It has been used with smaller and larger groups, as well as in groups with students with disparate backgrounds. We have used it And we have not yet experienced that the difficulties come from the case itself, but from the fact that students start to discuss what is actually meant by a service, or from discussing exactly how they should structure, e.g. the blueprint.

The experience is that the case allows for working with traditional service design methods, as well as introducing newer and advanced techniques. We are currently looking at developing exercises specifically to highlight servicescape (Bitner, 1992), conflict resolution (Akiyama et al, 2009), role-playing ()

Advancing the case portfolio

There are of course limitations with the flower shop case. First of all, the degree of complexity in interaction is only moderate, especially in the front-stage and service interface, so it gives little room for simplification from the interaction perspective. It is important that students that go further than the first case, learn to deal with complexity at the interaction level. Secondly, the systemic complexity is low. Even though this makes the case fairly open

for first time students, the challenge for redesign is not very high. Using, e.g., the parking case or a health care case, where the design space related to complexity is high, the need for thorough research and understanding of organizational issues are much higher. The flower shop case makes it possible for students to use their established research skills and analytical skills to understand what is happening and why. But in later cases in service design education, students need to refine and develop their skills regarding researching, understanding and redefining issues of complexity.

One aspect that is almost lacking totally in the flower shop case, is the transformation aspect. Only very few of the new design concepts that the students generated, show signs of transformational aspects. The two driving forces here deals with sustainability issues or branding issues, and the transformation aspects were not dealt with consciously, but were indirect effects of suggested design concepts. Finding a case that also gives the students the possibility to work with service design as transformation, is of uttermost importance. To get there we expect to end up with a renewed set of criteria, a new structured divergence process, and a new round of judgments.

We aim at developing an on-line repository of cases, with attached exercises, that can be shared by teachers. Possibly such a repository will contribute to helping service design education to build on the experience of many teachers in an open climate, and in the long run to give students similar basic understanding of what it means to design for service.

All in all, the flower shop case have been a successful first case experience with designing for service, and we continue to develop this and other cases in order to end up with a portfolio of cases that can be used for different purposes.

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Understanding delegated actions: Toward an activity-theoretical perspective on customer-centered service design

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Abstract

The paper presents an exploration of service design from the point of view of activity theory. The analysis in the paper builds upon recent work in service design (e.g., Holmlid, 2007; Sangiorgi, 2009; Wild, 2010), and extends our own previous research, in which activity theory was applied in analysis and design of interactive artefacts (Kaptelinin and Nardi, 2006; Uden and Willis, 2001). The discussion in the paper focuses on how services are integrated into customers' activities. We argue that activities supported by services represent a special type of human activity: they are both collective (since they are performed by several actors) and individual (since their structure is primarily determined by the hierarchy of goals of one actor, i.e., the customer). According to the position, advocated in this paper, services can be considered as delegated actions. We tentatively identify a set of issues that need to be taken into account in service design, namely: core vs. auxiliary actions, poly-motivation, complex mediation, dynamic social distribution, whole life-cycle support, and long-term appropriation.

KEYWORDS: service design, activity theory, Human-Computer Interaction

Introduction

Traditionally, the fields of Human-Computer Interaction (HCI) and interaction design have been mostly concerned with analysis and design of digital artefacts, both conventional computing systems and interactive products in general (Sharp et al., 2007). It is becoming

increasingly obvious, however, that the traditional scope of HCI and interaction design is too narrow and should be expanded beyond individual artefacts (Kaptelinin and Bannon, in press).

Interaction between people and digital technologies is no longer centred on individual technological artefacts. Instead, it is organized around configurations of devices, applications, and network connections, which collaboratively produce a valuable, meaningful outcome to the user.

For instance, a person travelling by plane may purchase their ticket via the internet, receive a reminder as an SMS sent on their mobile phone, and check-in at the airport using a self-service kiosk. Supporting the user in that case requires that not only individual technologies but also the system as a whole be properly designed. In a sense, the design of the system as whole is more important, since each component technology, such as a particular web browser, mobile phone model, or self check-in kiosk type, is not that critical and can be substituted with a similar technology.

Expanding the scope of HCI and interaction design beyond individual digital artefacts is a necessary step, but it also raises a number of difficult questions. One of the most central ones is: What is the object of analysis and design in HCI and interaction design, if it is not a device or an application? A possible way to answer this question is to consider “service design” as an object of research and development in HCI and interaction design. As witnessed by this workshop, this notion is steadily gaining ground the research community, especially in recent years (e.g., Holmlid, 2007; Wild, 2010).

In this paper we aim to contribute to the conceptual exploration of the concept of service design by bringing in the theoretical framework of activity theory. Activity theory has already established itself in more traditional HCI and interaction design research (e.g., Kaptelinin and Nardi, 2006). The framework was also employed in service design research by Sangiorgi (2009). Our analysis builds upon this research and makes an attempt to further develop an activity-theoretical perspective in service design.

The specific focus of the discussion in the paper is the activity of the customer. While service provision and consumption comprises a complex network of activities, the activity of the customer (an individual or collective entity) is of special importance. Understanding of customers’ activities is a critically important step in customer-centred service design, and successful integration of a service into customers’ activities is the ultimate criterion of the evaluation of a service.

The remainder of this paper is organized as follows. The next section provides an overview of main ideas and principles of activity theory, and outlines the use of the theory in HCI and interaction design. After that we discuss how services, as opposed to individual digital artefacts, are integrated into the structure of human activities, and what factors are critical for the integration to be successful. Finally, we conclude with a tentative set of design sensitivities, derived from activity theory, regarding service design.

Activity theory and HCI

An activity-theoretical perspective in HCI

Activity theory is a theoretical approach originating from Russian psychology (Leontiev, 1978). The foundational category of the approach is activity, understood as a purposeful, social, mediated, hierarchically organized and continuously developing interaction between people and the world. It is typically represented as a “S <-> O” (that is, “Subject – Object”) interaction. Activity theory has become adopted in a variety of fields, including HCI (Bødker, 1991), where it has established itself as one of the main theoretical perspectives.

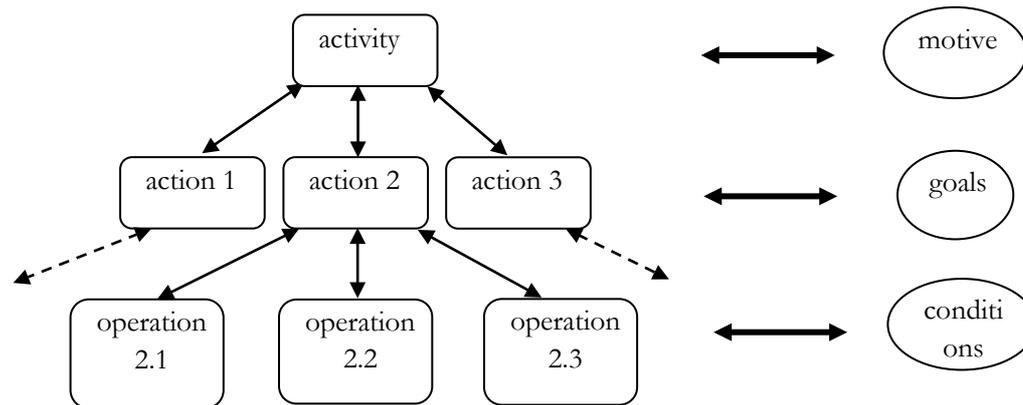


Figure 1: Hierarchical structure of human activity

The introduction of activity theory to the fields of HCI and interaction design contributed to recognizing the importance of understanding technology in the context of meaningful human activity and need for conceptual tools supporting such an understanding. In addition, adoption of the approach resulted in the development of a range of analytical tools and concrete interactive applications and systems, informed by activity theory (Kaptelinin and Nardi, 2006; Uden and Willis, 2001).

Main ideas and principles of activity theory

The conceptual framework of activity theory can be schematically presented as comprising two main ideas and five basic principles. The main ideas are: (a) the unity and inseparability of consciousness and activity, which means that human mind emerges and develops as a part of human interaction with the objective world, and (b) the social nature of human activity, which means that human beings do not interact with the world alone; the very nature of the interaction is defined by culture and society.

These two ideas can be elaborated into the following set of basic principles of activity theory:

Object-orientedness. All human activities are directed toward their objects (not necessarily physical things), which motivate and direct activities. Analysis of objects is a necessary requirement for understanding human activities, both individual and collective ones.

Hierarchical structure of activity. According to Leontiev (1978), activities are organized into hierarchical levels of activities, actions, and operations. An activity, motivated by a certain

need, is carried out as a sequence of *actions*, that is, conscious processes, directed at *goals*. In their turn, actions are implemented through lower-level, routine processes called *operations* (Fig. 1). Actions can be poly-motivated, that is, subordinated to several motives and/or higher-level goals at the same time.

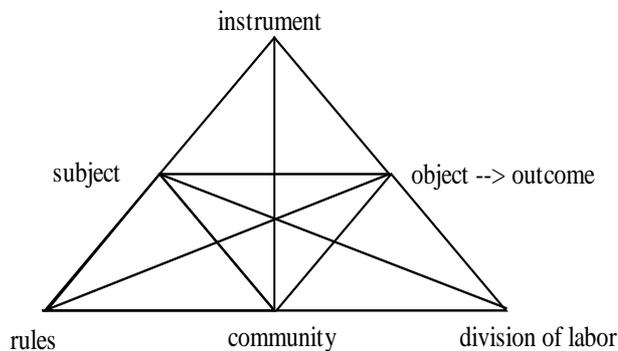


Figure 2: Engeström's activity system model

Internalization/ externalization. Any activity includes both internal and external components. There are mutual transformations between them. In the process of *internalization* external components become internal. The opposite process is called *externalization*.

Mediation. To achieve their meaningful goals people employ various mediating artefacts, or tools, which reflect the previous experience of other people. Tools shape human activities, thus enabling the accumulation and transmission of social knowledge.

Development. Activities undergo continuous developmental transformations. Analysis of such transformations is of critical importance for understanding human activities.

Versions of activity theory

The original version of activity theory was developed in the 1950s-1970s by the Russian psychologist Alexey Nikolaevich Leontiev (1978), who was heavily influenced by his mentor Lev Semenovich Vygotsky, as well as other contemporary Russian psychologists, such as Sergey Leonidovich Rubinshtein. This version of the theory primarily deals with activities of individual human beings.

More recently, another version of activity theory, aiming to take into account collective activities, was proposed by the Finnish education researcher Yrjö Engeström (1987). The underlying model of the Engeström's framework is derived from Leontiev's "S <-> O" model by including a third node, that is, *community* (C) and then introducing different types of mediational means for each component of the three-way interaction (Fig. 2).

Currently Leontiev's and Engeström's frameworks are the most common variants of activity theory. The application scopes of these two frameworks, while partially overlapping, are rather different. Leontiev's approach provides a more elaborated set of analytical tools for understanding and supporting individual human activities, while Engeström's activity system model is more suitable for analysis and support of large groups and organizations.

Service as an object of analysis and design

Tools and services: From tool mediation to delegated actions

So far, the activity-theoretical perspective in HCI research has been primarily concerned with *tool mediation*, that is, with how technologies are appropriated by individuals and groups, how individual and collective activities are transformed as a result of tool appropriation, and how interactive tools should be designed in order to make a positive impact on human activities (Kaptelinin and Nardi, 2006). As mentioned, with some notable exceptions (e.g., Sangiorgi, 2009), there has been a lack of activity-theoretical analyses of services. Therefore, a legitimate question to ask is: Can the activity-theoretical perspective in HCI be extended beyond tool mediation to analysis and design of services?

As argued below, there are reasons to think that the conceptual framework of activity theory can be usefully applied to understanding and support of services, as well. At the same time, such an application provides a challenge to the activity-theoretical perspective in HCI and requires that its concepts and methods be further elaborated.

The most basic premise of the activity-theoretical perspective in HCI is that technological artefacts should be analyzed in the context of meaningful human activities. Arguably, this premise is equally applicable to interactive services.

Consumers experience value through their activities and how service fits into the context of activity systems. Therefore, we need to understand how service is embedded in the context of consumer activities and how the value of different activities is experienced. Researchers have suggested that value emerges from within the customer's activities (Woods 1981; Normann 2001; Grönroos 2008). Value is therefore experiential and subjective (Sandstrom et al 2008). Customers experience positive value when they are able to do something that they enjoy, or feel that they have achieved a desired activity.

Because customers seek to create experiences of value for themselves through their activities, and that different activities are interlinked and complement each other, it is important that we can observe and analyze consumer's activities.

Many researchers (Normann 2001; Vargo et al 2008) argue that experience of value can vary according to the context where it is realised. Heinonen (2004) defined context as the situational context, such as time or place of the service encounter. Context is also defined by Gupta and Vajic (2000) as the physical or social setting of the encounter. Consumers will experience value when they are able to engage in an ongoing concern or complete a particular task successfully (Ravald 2008).

While the most fundamental requirement to both technological artefacts and services is their proper integration into meaningful activities, the roles and functions of technologies and services in human activities are somewhat different (if closely related). Technological artefacts predominantly serve as "tools" and "instruments" mediating individual and collective activities. Services, however, cannot be easily defined using these terms. What are the characteristic features of services, differentiating them from technological artefacts?

To answer this question we need to consider the specific nature of the activities supported by services, that is, customer activities, into which services are integrated. A closer look at such activities reveals that they can be characterized as both individual and collective ones.

On the one hand, services, as opposed to technological artefacts, always imply a collective effort, an activity performed by at least two agents. Value creation through services is a collaborative process and is always co-created (Sporher et al., 2008).

On the other hand, activities supported by services are not typical collaborative activities, in which the whole team is working toward a common goal. In the case of services collaboration is asymmetric, its goal structure is subordinated to individual objectives of one of the participants. The asymmetry is reflected in the very meaning of the term. Although there are different definitions given to service, we concur with Vargo & Lusch (2006), that service is the application of resources *for the benefit of another*. In other words, service is seen as the process of doing something *for* and with another party.

Therefore, services are actions, which are embedded in the activity structure of one actor (the customer), but carried out by another actor or actors. Accordingly, we suggest that, from a customer-centred perspective services should be considered *delegated actions*.

The basic principles of activity theory: Implications for service design

Some of the general requirements that need to be met in order for services, understood as delegated actions, to be effectively and efficiently integrated into the structure of customer's activity can be clarified by turning to the basic principles of activity theory, described in section 2.2 above.

Object orientedness. Object gives an activity a direction and determines the meaning of its component parts. Understanding the actual objects of customer activities in service design is important for two reasons. First, finding ways to support the customer in reaching their objects can help identify potential ways of value creation for the customer. Second, understanding the objects can help establish the scope of the provision of services, that is, differentiate between *auxiliary* actions (which the customer might want to delegate) from *core*, “undelegatable” actions, which customers in fact would like to carry out themselves (e.g., we typically do not want a travel agent to *travel* instead of us...)

Hierarchical structure of activity. Understanding the structure of customer activities, in which services are embedded, is crucial for a successful service design. Such an analysis can reveal the role and place of delegated actions in an activity as a whole. Special attention needs to be paid to *poly-motivation*, that is, multiple motives and higher-level goals (such as avoiding excessive costs), collectively defining whether or not a service should be requested, and, if yes, on what conditions. It should also be taken into consideration that a specific configuration of active motives and goals can be different in different contexts.

Many researchers believe that value that emerges from within these activities is relativistic and context-dependent (Vargo and Lusch 2008; Raval 2008). Value is created for customers for themselves using resources offered by a company (Vargo et al 2008). The customer is thus an active integrator of information and services. As a result of this, the company has shifted from being a producer of value to a supporter of value (Grönroos 2008). Customers need to do certain activities. They must (or want to) interact with companies to be able to do them. According to Raval (2008), “Because customers use the company resources within their own activities, they evaluate these resources according to how well they are able to support them.

Mediation. Designing services, rather than individual interactive technologies, requires that complex configurations of interactive and non-interactive artefacts be taken into

consideration and, if necessary, reconfigured. Instead of simple mediational means, analysis and design should focus on *complex mediation* (Bødker and Andersen, 2005), comprising networks of technologies and people.

Internalization/ Externalization. Typically, service providers do not *constantly* communicate with their customers. There are alternating phases of communication and non-communication, and one of the aims of service design should be striking a right balance between these phases to make sure that a service is both efficient and non-obtrusive. From an activity-theoretical perspective the alternating phases represent a *dynamic re-distribution* of an activity along the individual-collective dimension. The sequence of the phases is determined by the inner logic of an unfolding activity.

Development. Services and activities develop over time, and developmental transformations take place at several levels simultaneously. Let us consider two types of developmental processes relevant to service design. First, there are lifecycles of particular instances of services: a service is selected, initiated, unfolds, is completed, and eventually is disposed of. Service design should aim to support whole lifecycles rather than selected parts or phases of the whole process. Second, some services, such as internet banking, need time to be fully appropriated and can eventually become success stories despite initial customer resistance, frustration, and distrust.

Conclusions

We believe and argue that a framework such as activity theory that looks at ongoing human interaction with the world and encompasses relations with others, and the socio-historic mediation of learning and development is an alternative approach that can be used to develop services that meet users' needs. Applying activity theory to service design means to take seriously all aspects of activity from activity motive formation to the triggering of operations under certain material conditions.

What sets activity theory apart from other approaches is that the anchoring in a collective/shared practice allows us to talk about more than just individual skills, knowledge and judgement and not just about generic human beings. According to AT, we can talk about the appropriateness of a certain tool for a certain praxis and study how the introduction of a particular artefact changes practice and how practice may change the use of artefact. As practice develops over time, concern for the historical context of an artefact in use is essential.

As we argue in this paper, the general framework of activity theory can be applied not only to interactive technologies, but to service design, as well. The analysis in the paper specifically focuses on customer's activity¹. The analysis allows us to characterize services as delegated actions, and suggest a tentative set of issues relevant to service design: issues of core vs. auxiliary actions, poly-motivation, complex mediation, dynamic social distribution, whole life-cycle support, and long-term appropriation.

¹ It should be noted that understanding the activity of service providers' – or service activity -- is a different issue, which requires a special type of analysis.

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A Product-Service Systems Design Method with Integration of Product Elements and Service Elements Using Affordances

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Abstract

This paper describes the systematic design method for Product-Service Systems (PSS) where service and product elements are integrated using affordances. In the PSS design method, a service element is composed of the activities from the service blueprint and the functions from the function analysis. The service elements contain the service providers and receivers and their activities and are to be connected with appropriate product elements. The integration of service elements and product elements is done by mapping service elements to product elements using the affordance. The activities of the stakeholders are the key in a service element and the product elements associated to a service element should be those that support these activities. As the affordance is defined as the property of the artifact that naturally induces certain human activities, affordances provide the means for designing product elements from service elements. The function-activity interaction method is used to identify relevant affordances and then the affordance features, structural aspects of products that provide affordance, are designed. Specific instances of those affordance features realize the relevant product elements. A case example is illustrated to demonstrate that this method can help to systematically design service elements and product elements of a PSS in a service-dominant approach.

KEYWORDS: Product Service Systems (PSS), PSS Design, PSS Representation, Service Element, Product Element, Affordance, Affordance Feature

Introduction

Product-Service Systems (PSS) have recently drawn significant attentions since it could address diverse values of consumers and create new market with more profits by providing integrated solutions of products and services. PSS has a number of diverse aspects such as stakeholders, activities, functions, product elements, service elements, and so forth. Therefore, the appropriate representation scheme for PSS should be necessary for effective designing.

For the PSS design and modelling research, the molecular modelling of service by introducing product elements, service elements, bond and essential evidence was proposed by Shostack [Shostack, 1982]. In her molecular modelling, the connection between product and service elements was made by a simple line – bond. In 1995, Congram and Epelman adopted the Structured Analysis and Design Technique (SADT) to design services [Congram and Epelman, 1995]. They claimed that SADT focused on activities which could be major building blocks of services and that SADT models could help employees at every level to understand what happens in delivering a service.

More recently, Morelli and Tollestrup have studied various service design methods such as the actor network mapping, motivation matrix, IDEF0, system platform and use cases [Morelli and Tollestrup, 2007]. Shimomura and his colleagues, in their service engineering research, proposed the service model containing several sub-models such as flow model, scope model, view model and scenario model [Sakao and Shimomura, 2007; Hara et al., 2009]. Maussang et al. proposed the functional block diagram to correlate product unit and service unit in the PSS design process [Maussang et al., 2007]. More recently, a framework of PSS design method has been proposed by the research team of Kim and his colleagues at the Creative Design Institute with emphasis on context-based stakeholder activities with association of experience values as well as economical and ecological values [Kim et al., 2010; Cho et al., 2010].

Although there have been some research efforts on PSS design and modelling, the systematic and detailed framework to define and associate service and product elements has not been substantially studied. The previous research on the PSS design and modelling has dealt with simple gathering of product and service elements, and their relations were not

systematically addressed. Besides, the linkage among stakeholders, activities, and service/product elements was not studied, which is very significant to design PSSs.

The research in this paper aims to study the PSS design method where service elements are mapped to product elements with the usage of affordances. The activities of the stakeholders are the key in a service element and the product elements associated to a service element should be those that support these activities. The case study on the urban umbrella rental PSS is conducted to examine its effectiveness.

Affordances and Function-Task Interaction Method

Affordance was coined by perceptual psychologist James J. Gibson as follows: The affordances of the environment are what it offers to the animal, what it provides or furnishes, either for good or ill [Gibson, 1979]. It implies the interaction of the animal and the environment. Gibson's essential concept of affordance is that relationship exists in a pair of animal and environment and some parts of this relationship are the invariant features of the environment permitting the animal to do things. According to Norman, the affordance refers to the perceived and actual properties of the things, primarily those fundamental properties that determine just how the thing could possibly be used [Norman, 2002]. In other words, the affordance is the message which could be perceived by a human user so that the product or service function can work with user's activities naturally induced with the help of such messages.

Galvao and Sato introduced the Function-Task-Interaction (FTI) method to provide an effective guidance to reasonably implement the concept of affordances in the product architecture [Galvao and Sato, 2005; 2006]. Their method is composed of following four phases: 1) User and product studies, 2) Affordance investigation, 3) Interaction exploration, and 4) Simulation and evaluation.

In the phase of user and product studies, the collection and organization of information on users' activities and on product architecture are included. The task analysis and functional modelling approach are conducted in this phase to increase the understanding about users' activities and products. The second phase is the affordance investigation where the essential relationships between the users and products are investigated. The definition of these relationships can be accomplished by two steps: 1) understanding user requirements, and 2) interpreting them in terms of required, desirable or undesirable affordances. The third phase, interaction exploration, the FTI matrix is created by relating user tasks and product functions. While associating user tasks and technical functions, three types of interactions are considered such as physical interactions, cognitive interactions, and both. The groupings of these interaction elements are followed to produce the functional affordances. Finally, in the last phase of simulation and evaluation, the designers explore provisional affordance recommendations and options based on the relationships identified in the matrix.

PSS Design with Affordances

The flowchart describing the PSS design method using the affordance concept is shown in Figure 1. The activities from the service blueprint and the functions from the PSS function modelling are combined in the service blueprint with function in the first stage. From the service blueprint with function, the target pair of function and activities should be selected, and then the service element is defined. After defining the service element, the function-activity interaction analysis is conducted to identify essential affordances and affordance features. An affordance feature represents the structural elements that provide the affordance [Kim et al., 2009; Kim et al., 2011]. The morphological matrix approach is also used to explore the possible solution instances for the required affordance features. Finally, the product elements are determined and their conceptual sketches can be generated to come up with the alternative PSS concepts.

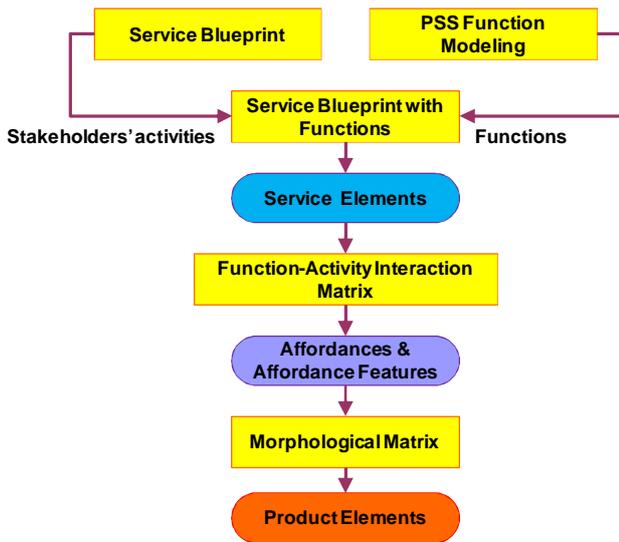


Figure 1 Flowchart of PSS design method with affordance

The overall schematic diagrams of the PSS design method with affordances are also given in Figures 3 and 4. In Figure 2, the service element can be schematically expressed as the block which resembles the function block with input and output flows. There are three nodes for stakeholders (circular node), activities (square node) and linkage with product elements (diamond node). The stakeholders – service provider and service receiver – and the activities come from the service blueprint.

The snapshot of the function-activity interaction (FAI) matrix is also shown in the bottom part of the Figure 2. The form of FTI which was originally proposed by Galvao and Sato was borrowed for building up the FAI matrix as a task is composed of activities.

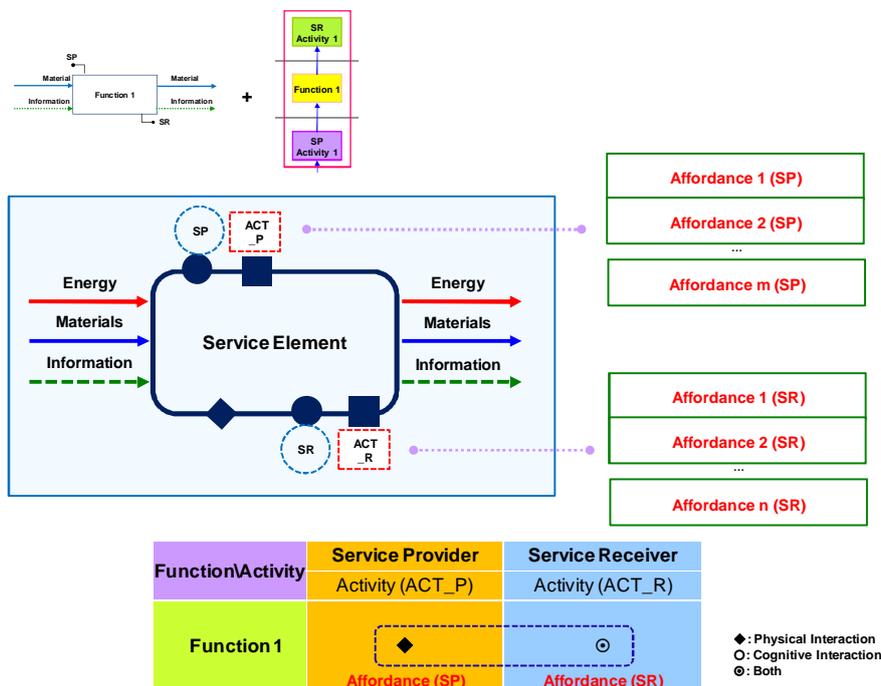


Figure 2 Overall schematic diagrams of the PSS design method with affordances

When considering the interactions among functions and activities, those activities are classified into those of service provider and service receiver, respectively. Three interactions such as physical, cognitive and both interactions are considered. Then, the critical affordances can be identified and assigned to the single interaction or the group of

interactions. Those affordances can also be classified as those for service provider and service receiver. Once the affordances are identified, the product elements having the required affordance features are conceived and their conceptual sketches may also be generated. In the schematic diagram of PSS representation given in Figure 3, the identified product elements are linked with the service element through the affordances.

Case Example: Urban Umbrella Rental PSS

In the case study, the urban umbrella rental PSS at the subway station was considered. Figure 4 shows the possible scenario associated with umbrellas in urban life. People might need the umbrellas at the public place in the case of sudden raining. In addition, the floors of a public transportation place such as a subway station could be very slippery due to water dropped from the umbrellas.

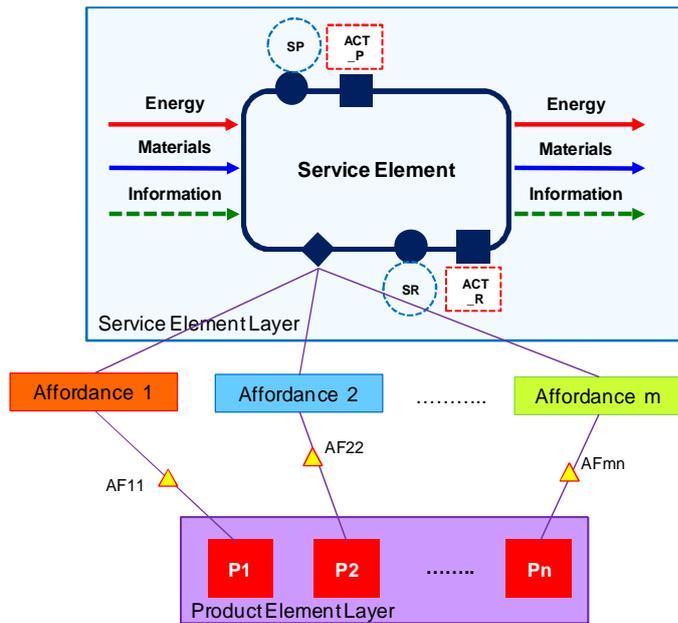


Figure 3 Schematic diagram of PSS representation

To solve the problems generated from the above scenario, the urban umbrella rental PSS at the subway station was designed based on the proposed method in this paper. Figure 5 shows the service blueprint of the new urban umbrella rental PSS at the subway station. For the case example, the functions of 'provide umbrella' and 'return umbrella' were selected for the study. In the case of the function of 'provide umbrella', the associated activities are 'make umbrella available' of the umbrella provider (service provider) and 'access umbrella', 'take umbrella' and 'move away with umbrella' of the user (service receiver). The service element was defined as 'provide umbrella service' and the associated flows were assigned to the block of the service element.



Figure 4 Scenario associated with umbrellas in urban life

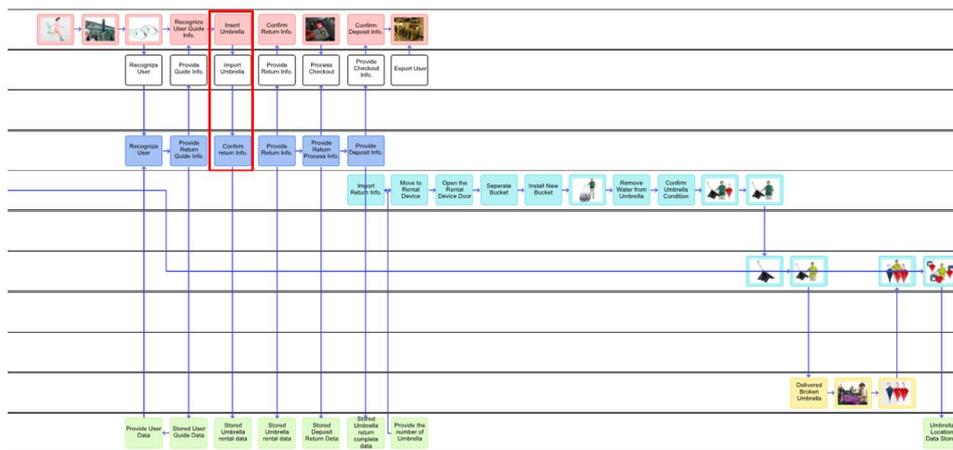
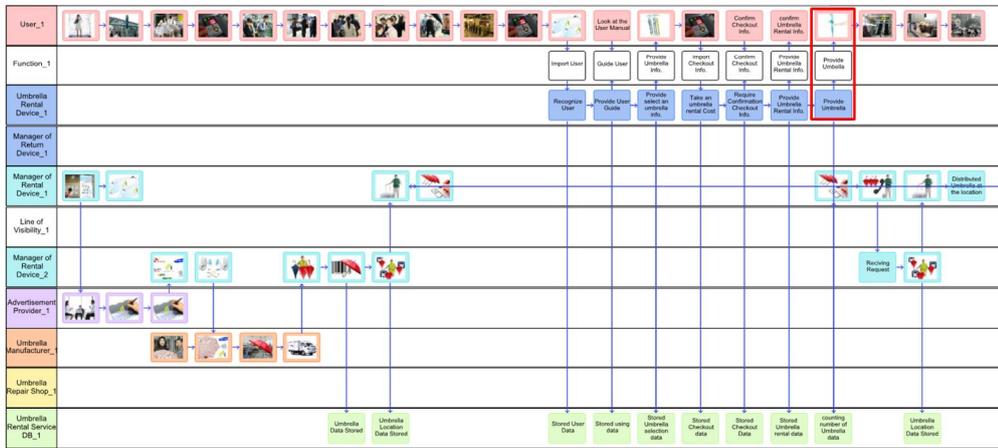


Figure 5 Service blueprint of the urban umbrella rental PSS at the subway station

Figure 6 shows the FAI matrix to identify the affordances. As can be seen in Figure 6, the identified affordances were 'provide-ability', 'access-ability', 'grasp/take-ability' and 'move-ability'. To satisfy the required affordance features, the product elements of 'umbrella handle', 'umbrella output structure' and 'passage structure' were conceived.

| Function/Activity | SP | SR | | |
|-------------------|-------------------------|-----------------|---------------|-------------------------|
| | Make umbrella available | Access umbrella | Take umbrella | Move away with umbrella |
| Provide umbrella | ⊙ | ⊙ | ◆ | ◆ |

Note: Red diagonal labels in the original image: 'Provide-ability' (top-left to bottom-right), 'Access-ability' (top-left to bottom-right), 'Grasp/take-ability' (top-left to bottom-right), 'Move-ability' (top-left to bottom-right).

Figure 6 Function-activity interaction matrix for 'provide umbrella'

The PSS representation diagram is given in Figure 7. As can be seen in Figure 7, the identified affordances played a role of linking the product elements to the service element. The conceptual sketch given in Figure 7 could be the best solution among a number of possible solutions obtained from the morphological matrix. It included the required affordance features. With the PSS concept given in Figure 7, the user can easily access to the umbrella output device and conveniently pick up the umbrellas by pulling out their handles. Since the subway station is usually very crowded, the passage structure that allows the users to smoothly move away with umbrella was also needed.

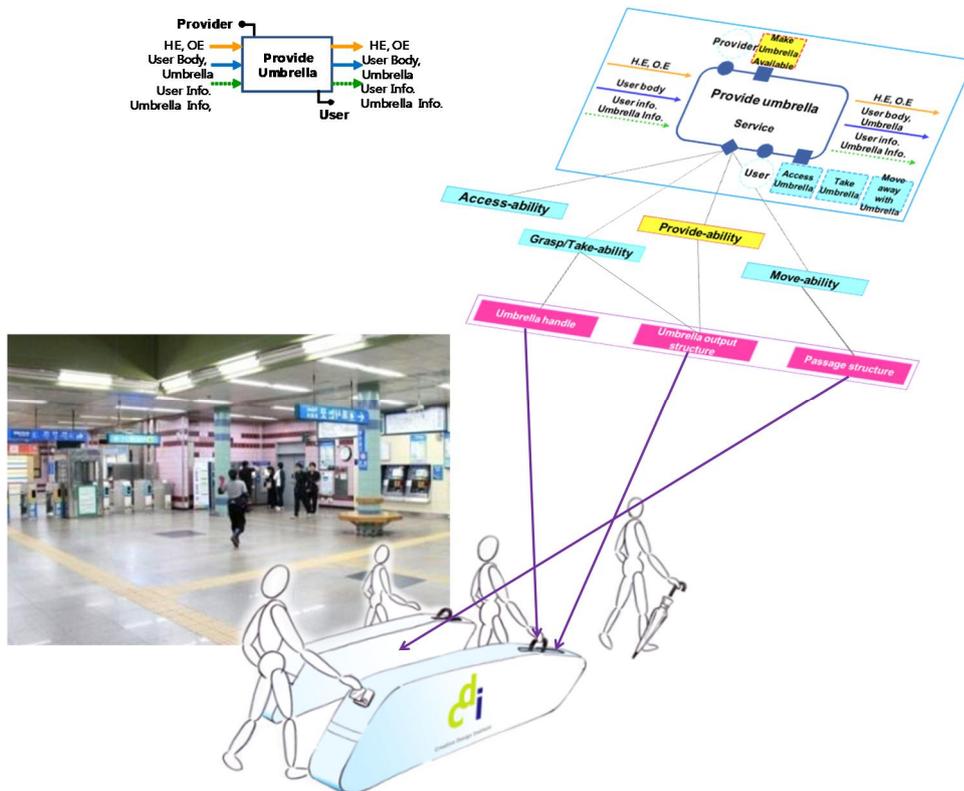


Figure 7 PSS representation for the function of 'provide umbrella' and the concept sketch of the product elements

In the second case example, the function of 'return umbrella' was considered. In this case, the associated activities were 'recognize umbrella', 'receive umbrella', 'arrange umbrella' and 'store umbrella' for the umbrella receiver and 'remove water', 'leave umbrella' and 'move away' for the returning user. Similar to the first case, the FAI matrix was generated and the affordances were identified, which is given in Figure 8. The identified affordances were 'identify-ability', 'receive-ability', 'arrange-ability' and 'store-ability' for the umbrella receiver and 'water remove-ability', 'leave-ability' and 'move-ability' for the returning user.

| Function Activity | SP | | | | SR | | |
|-------------------|--------------------|------------------|------------------|----------------|----------------------|----------------|--------------|
| | Recognize umbrella | Receive umbrella | Arrange umbrella | Store umbrella | Remove water | Leave umbrella | Move away |
| Return umbrella | Identify-ability | Receive-ability | Arrange-ability | Store-ability | Water remove-ability | Leave-ability | Move-ability |

Figure 8 Function–activity interaction matrix for 'return umbrella'

The PSS representation schematic diagram for the function of 'return umbrella' is given in Figure 9. The defined service element was 'return umbrella service', and the conceived product elements were the user identifier, umbrella input structure, umbrella waterspout, umbrella storage and passage structure. The conceptual sketch including the above product elements is also given Figure 9, which was considered to be the best solution among many alternatives. With the concept given in

Figure 9, the returning user could simply dry and insert the wet umbrella to the umbrella input structure without blocking the stream of other returning users. The inserted wet umbrella would be properly arranged and stored inside the device.

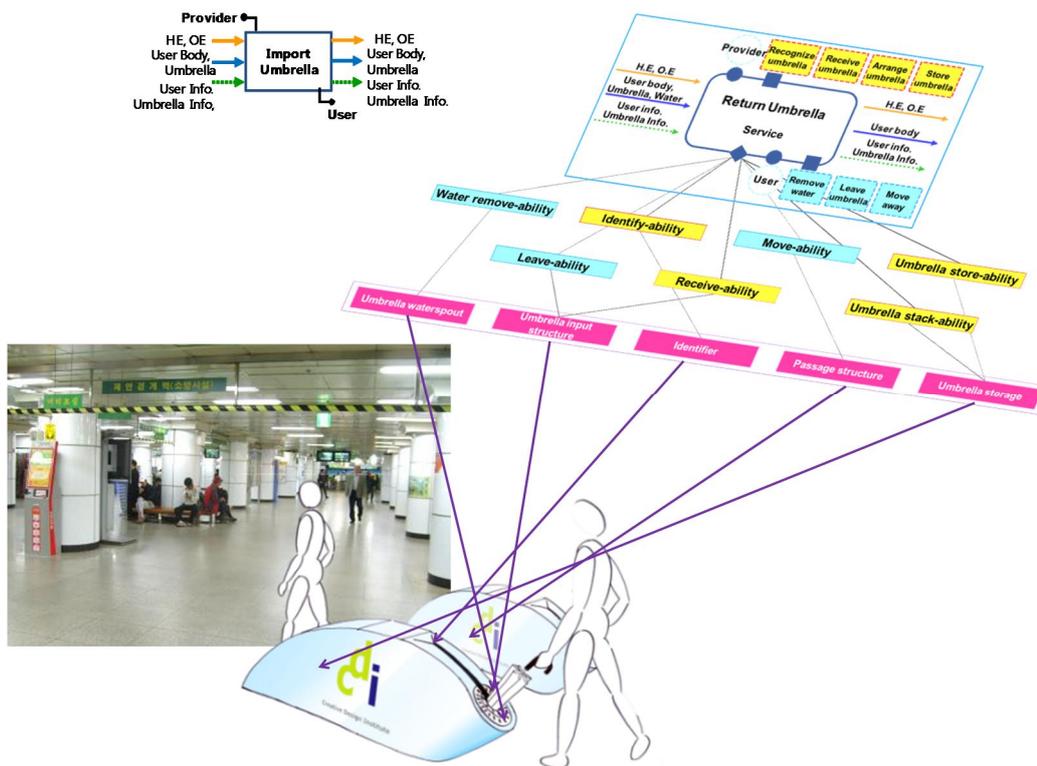


Figure 9 PSS representation for the function of 'return umbrella' and the concept sketch of the product elements

Conclusions

This paper presented the systematic design method for Product-Service Systems (PSS) by integrating service and produce elements using affordances in a service-dominant approach. In the PSS design method, the activities from the service blueprint and the functions from the PSS function modelling were combined in the service blueprint with function. Then, the pair of function and activities was selected, and the service element was defined. After defining the service element, the function-activity interaction analysis was conducted to identify essential affordances and affordance features. The morphological matrix approach was also used to explore the possible solutions including the required affordance features. Finally, the product elements were determined and their conceptual sketches could be generated to come up with the alternative PSS concepts.

In order to examine the effectiveness of the PSS design method, the case study of the urban umbrella rental PSS was conducted. In the case studies, the functions of 'provide umbrella' and 'return umbrella' were considered as representative examples, and the possible PSS concepts allowing the users to conveniently pick up and return the umbrella by including the essential affordances which were extracted from the FAI matrices were generated.

The PSS involves a number of stakeholders and their various activities. Therefore, it was confirmed that the usage of the affordances for integrating service elements and product elements was effective, since the affordance was the key property of the product elements that allows stakeholders' activities by its definition.

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Games as Design Medium

Utilizing Game Boards for Design Enquiry with Cancer Patients

J. Kronkvist, M. Järvinen and T. Leinonen

Abstract

As the view of patients as passive receivers of care is changing towards more active participants in the healthcare process, hospitals are gearing up to provide more patient-centric services. At the same time, they are under increasing pressure to do more with stretched resources and demographic changes. To this end, service design has been utilized in many institutions to provide insights gathered from stakeholders and to design services to that focus on the patient. However, hospitals as a unique design context provide specific constraints for the design process. This paper presents a method of enquiry that was developed during an experimental service design project in which services were developed for sarcoma-type cancer patients. The method borrows visualizations, tangible props and actions from the world of games to assist the patients in the interviews to remember, understand and communicate their patient experiences. The patient journey was visualized in the form of a board game and physical props used by the patients to indicate significant people and events during their care. The game board acted as a design medium, both presenting information for the participants and engaging them to communicate personal and sensitive experiences. It was observed that in addition to the patients, the hospital staff was drawn to the game board as a way of representing information about the patient journey in an easily accessible way. The feasibility of the method was evaluated in the action and fine-tuned during the process. This paper describes the context of the case, the method developed and discusses the implications of this method for design research in services.

KEYWORDS: design research, patient experience, design games, customer journey

1 Introduction

The project described in this paper, conducted at a large hospital in Finland, was primarily founded on a need to renew the hospital organization to focus on value

created for patients and to prepare the way for a construction of a new wing in the hospital building. The pilot group chosen for this study, patients with a sarcoma-type cancer, present specific constraints to the design inquiry that needed to be taken in accord when planning the methods. As design researchers, we were drawn to this pilot group partly due to the challenges it posed for the design process. Planning within these constraints and drawing inspiration from the field of design games, we created a new method based on a customer journey game board. By utilizing this method in our interviews we were able to gather data on patient experiences that could have been otherwise left out due to their sensitive nature.

In this article, we first go through the context of the study, a cancer treatment unit at a hospital in Finland, present relevant theoretical background for the development of the method, describe the method in detail and finally discuss the implications of the method to the service design field.

2 Sarcoma Patient Treatment at Tampere University Hospital

The number of sarcoma-type cancer cases has been increasing at the case study institution, the Tampere University Hospital. This is due to a move towards centralizing sarcoma treatment to a few key hospitals in Finland. The move for centralization is motivated by a focus on providing the best possible quality of the diagnosis and treatment. In order to respond to these developments, a rethinking of resource-allocation is needed to ensure the most efficient and functioning way of producing services. During the year 2010 the hospital started a renewal program with the focus on patient-first and patient-centric thinking as a key priority. The objectives are to reform the hospital's operations and service, and to build or renovate facilities for outpatient clinics, wards and operation theatres. The reform should address a successful interplay between the different functions to ensure a flow in the services received by the patient. First on the development list are special care units, which are providing services on a national level.

Sarcoma is rare type of cancer, which presents specific challenges for treatment. Doctors are not usually experienced with diagnosing it, which may delay sending patient for further medical examinations. Sarcoma diagnostics and treatment are complicated and need co-operation of several different special doctors. Sarcoma patient goes through multiple tests which takes several weeks or even months. During the diagnosis phase, patients travel to the hospital many times, often from

long distances. After the diagnosis, most common treatments are surgery and radiation therapy. Surgeries are often large, time-consuming and extremely heavy for both patient and for medical staff. Recovering from the surgery is a stressful process which requires mental care and support in addition to the physical care for the wound. For the patient, a surgery can mean losing a limb or ability to move, which causes immense stress for the patient and family before and after the procedures. After the treatment phase patients are regularly invited to control visits at the hospital for detecting any possible cancer recurrences. This control phase can last for several years after the treatment has ended.

It was evident from the start of the project that patients with a sarcoma-type cancer present specific constraints for the design research. First, even though we considered hosting interviews on-site, due to the sensitivity of the issues under discussion and the fact that many of the patients have difficulties in standing or walking for long periods of time due to old age, we decided to arrange a private and comfortable space for the interviews. Second, revisiting the treatment process can be an exceptionally taxing exercise in which the researchers need to be sensitive to emotional and mental issues. It was important to make sure, that the interview situation is made as comfortable as possible to the patient and a safe atmosphere is created that supports intimate discussions. It was also essential that the researchers maintain their professional role since the interview situations might have a danger of being transformed into treatment for emotional traumas. Third, the patients need support in remembering their experiences of the treatment. Due to the lengthy treatment periods and a lack of oversight of the process, patients might have difficulties in remembering different phases and events. With these in mind, we iteratively designed a method that combines aspects of customer journey visualizations and design games.

3 The Design Media: Customer Journeys and Design Games

3.1 Customer Journeys in Design Inquiry

Customer journeys are one of the central tools in service design. They visualize a service from the customer's point of view by presenting it as sequential interactions between the customer and the service provider. They allow for the exploration of the intangible elements of a service by providing a visible and tangible artifact onto which the participants can map various aspects of the customer's experience throughout the service process (Kimbell 2009a).

Touchpoints, the individual points of interaction between the customer and the service provider, structure the service as a temporal process with a beginning and an end constituting a “journey”. The visualized aspects depend on the aim of the project and can be for example customer actions, goals and aims, areas of importance, physical items, service roles or opportunities for improvement. Assembled on a customer journey map they provide a holistic view of a service rendering it accessible for examination and redesign.

In design practice, customer journeys are used when analyzing and mapping a current service, creating ideas or conceptualizing new services and presenting results from an inquiry. They are also often used as boundary objects (Star and Griesemer 1989) in co-design sessions to allow dialogue between different disciplines, views and interests. In addition to the different components constituting a customer journey, the visual qualities play an important part. In contrast to service blueprints (Shostack 1984), which provide a detailed and technical, but often visually complex account of a service operation, customer journey maps often present a more simplified visual design. Diana et al. (2009) argue, that a careful consideration of the visual qualities of the representation can assist in various stages of the design process. Early on in a design process, abstract representations present general insights, avoid misleading information and leave sufficient space for the imagination. On the other hand, realistic imagery such as photos or drawings provide clues to the experience and atmosphere, allow for critical examination of the design setting, and later on concretize service ideas for evaluation and feedback.

3.2 Games as a Tool for Design

Games have been used in co-design and design inquiry as a metaphoric framework for engaging designers and stakeholders in a dialogue. The aim of the activity varies and examples include exploring design opportunities (Habraken & Gross 1987), creating scenarios of future use (Brandt & Grunnet 2000), negotiating organization of work (Ehn & Sjögren 1991) or analyzing data (Vaajakallio et al. 2009). Design games are seen as a useful way for involving stakeholders in participatory design as they create a common learning space for designers and users (Brandt 2006).

Games introduce a way for engaging the participants in a mode of storytelling through the use of certain rules, material props, and visual aesthetics that set the context. The rules set out the framework for interaction in games and they guide the participants through the game-playing process. Even though competition is

usually not the aim of design games, other rules, such as turn-taking, progression, tasks or roles can be used to structure the activity (Brandt 2004). Games also utilize a certain aesthetic to inform the participants of the context or goal of the game. Through the material, participants are invited to create meanings based on their personal experiences and share them with others. Pictures, visualizations, texture and material qualities are used to create the shared context in which the game is played. For example, in a game that is about building and managing hotels the materials might include pictures of the buildings, the visual design of a game board might suggest the aim of the game and the sensory qualities of the props might be hinting at their value or intended use.

Besides offering entertainment, games also offer participants an opportunity to discuss issues that might otherwise be considered difficult to share. While playing, the participants form an implicit contract which allows the extension of the boundaries of social conduct in a safe environment. Challenges, provocations or roles are used to make the participants act or express themselves in a way that they would normally not allow themselves to behave. In co-design, games can be used to create a setting in which the participants can free themselves from the constraints of social roles and engage in creative activities such as envisioning the future, enacting scenarios or creating use-cases for design props. Through allowing to act “out of the box” and based on the inspiration provided by the game it is possible to bring forth meanings that might otherwise be left outside the design space. In the context of the design project in question, games are understood as a social practice and utilized as a medium that allows for an engagement of the researcher and informant in a dialogue about the patient experience.

4 Game Board Patient Journey

4.1 Overview

The objective of the design research was to support the ongoing organizational change processes by providing insights based on qualitative data collected from the patients. We collected and analyzed data of their patient experience in order to improve services, assist in the planning of the treatment and offer insight into the development of supporting service infrastructure. The deliverables included design drivers guiding future design of services, improvements to the existing patient journey and new service concepts.



Figure 1 Different activities in the design research process

1. First we created **an initial understanding of the patient journey** together with two doctors. This was a **two-hour workshop** in which we co-constructed the patient journey visually on a poster on the wall. This exercise revealed big gaps in the knowledge of the doctors of what happens to the patients and who is responsible for it.
2. Next we interviewed caretakers with whom the patients are in contact by conducting a **walk-through of the patient journey** in the hospital. This refined our **understanding of the view the staff has on patient care** on the field and filled in gaps that were not recognized by the caring doctors. Based on this knowledge we were able to produce the first visualisation, which was a flow diagram. This was shown again to the staff to refine the patient journey and validate our understanding so far.
3. Now we had enough understanding to start with the **patient interviews**. The patient journey was visualized in the form of a game board and two types of wooden game props, a pawn and a button, were used to signify significant people or events. The game board is described in more detail later on.
4. Data from the interviews was **analyzed and formulated** into insights, design drivers, initial concepts and improvements.
5. The results were used as the basis of a **patient co-design workshop** in which the results were discussed and two initial concepts created during the analysis were worked on.

4.2 Gameboard design

The end result of the method iterations for the interviews, a board game, consists of a visual game board printed on A2 cardboard paper, three 3 cm high wooden pawns and three 3 cm diameter wooden chips. The game board visualizes the customer journey in a simplified form, showing the main touchpoints on a winding journey through the board and pictures taken of people, surroundings and artifacts.



Figure 1 Visual iterations of the customer journey

Layout: The board layout was kept as simple as possible to allow for fast comprehension in the interview situation and leave space for scribbles on the paper. Much of the information present in earlier visual iterations, such as descriptions of touchpoints, problems encountered or people involved, were left out. Even though we wanted to imitate a game board design, we kept the visual overview of the board solemn as we did not want to overstate the entertainment aspects of games.

Images: During earlier phases we had taken a vast amount of photographs from the hospital. Some of these were included in the board to provide visual triggers for the interviewees and allow them to point out specific people, places or items that affected their experience.

Text: The amount of text was kept minimal. It included a description of the purpose of the board and names of different touchpoints. Between the touchpoints where waiting times were considered to be too long we included a notification of time in weeks that the patient has to wait.

Symbols and icons: The symbols included round color-coded circles to specify touchpoints, a general winding journey timeline and arrows pointing from a touchpoint to the next. Colors usually specified those touchpoints that were either procedurally or temporally close to each other. For example, sample-taking consists of three touchpoints which were all coloured in light green.

Materials: The game board was printed on cardboard to give it the correct material feel. The pawns and chips were chosen to be wood so that they could feel comfortable and warm on touch in comparison to e.g. plastic or metal alloy.

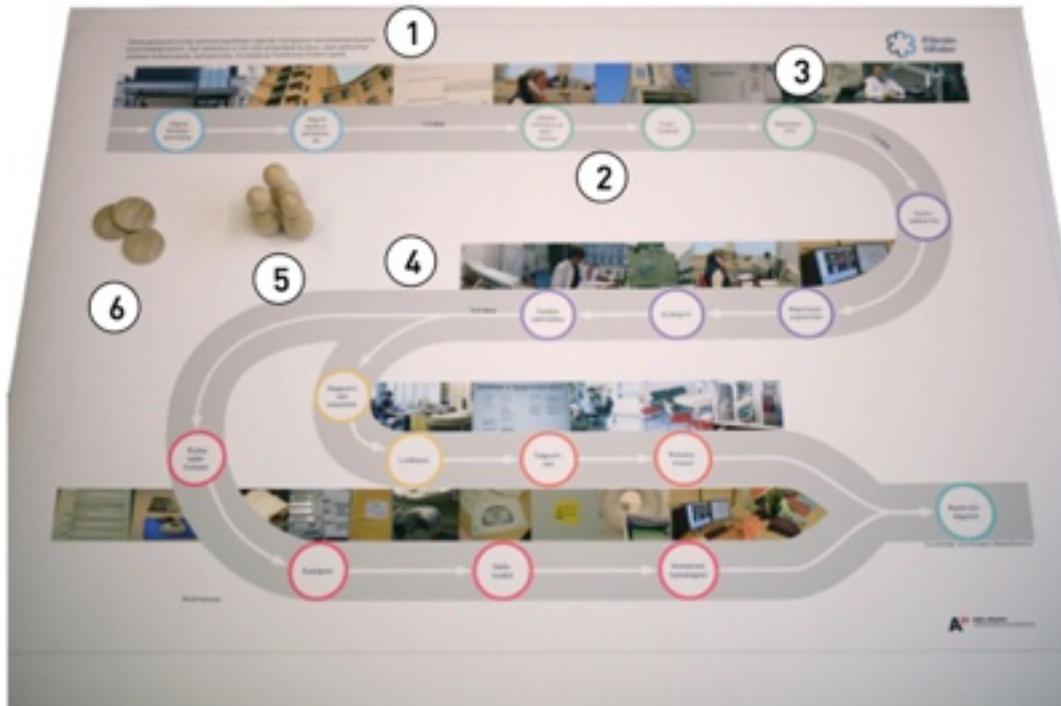


Figure 2 The gameboard composition

- | | |
|--------------------------------------------------------------------------------------------|------------------------------------------------------|
| 1. Short textual instructions to orientate the participant | 4. Differing treatments presented as diverging paths |
| 2. Touchpoints are visualized on a timeline and colour-coded according to treatment phases | 5. Wooden pawns representing significant persons |
| 3. Pictures taken of personnel and surroundings | 6. Wooden chips representing significant events |

4.3 Using the game board in interviews

The interviews in which the game board was used were held at the hospital and lasted approximately 1,5 hours each. Each interview was recorded on audio for later analysis. The game board was placed at a table in the middle of the room with chairs set close to the table. The ages of the interviewees ranged between 25 to over 70 years and all of them had gone through at least some parts of the treatment. We asked them to bring with them someone that had been close to them during the process and any kinds of important items they wanted to show.

The interviews were structured in three main parts: general questions, game board questions and closing questions. The first part started with an introduction

to the purpose of the interviews and general questions based on first impressions of the hospital. At this stage the main purpose was to set a comfortable mood for the interviews. After this, the game board was introduced and the patients were asked to place the pawns and chips on specific parts of the board to mark significant people and events that they had encountered. This activity often sparked discussions about specific events that the patients felt deeply about. At times the distinction between people and events became blurred as the discussion on significant events often involved significant people, and vice versa. However, we did not consider this a major drawback as the pawns were able to trigger reflection on patients' experiences, which was the main aim of the interviews. After the pawns were placed, the questions focused on specific parts on the map. As we wanted to keep the interviews as flowing as possible, we picked up clues from the patients' reflections to point to specific touchpoints. This was continued until all touchpoints the patients had experienced were discussed. If the patients mentioned any physical items, such as letters from the hospital, we asked them to present them for discussion. Finally, we ended the interview with issues that the patients still wanted to address that had not come up in the interviews. Sometimes these final discussions proved to provide valuable information that we had not thought of before.

The data produced from the interviews included audio recordings that were transcribed for analysis and images from the placement of the props on the table. These were pre-analyzed by the researchers and further studied in a two-day sense-making workshop.

5 Discussion

The value of design in service development is in a large part due to the ability of designers to visualize services to communicate within the design team and stakeholders (Segelström 2009). Through constructing visualizations using different aesthetic qualities designers also have the ability to create aesthetic experiences (Dewey 1934; Rylander 2011) that allow for new meanings to emerge. Historically designers have paid more attention to the meaning embedded in the form than to the associations it facilitates in interaction. Krippendorff (2006) emphasizes that designers need to become more aware of the meanings stakeholders create through using and discussing artifacts created by them and that they have competences for this. In addition to the attention that is paid towards rational understanding, designed artifacts can also evoke emotional and situated meanings, which are notoriously difficult to capture and

thus traditionally dismissed in management research (Rylander 2011). Considering the recent attention paid to user experiences in the design of products and services, the methods by which to evoke emotional meanings become increasingly important.

The game board method consciously combines the design of aesthetic qualities with customer journeys and design games to support the inquiry phase of service design. It does this through a conscious utilization of gaming metaphors and inclusion of photographs that remind the patient of their service encounters. During the interviews the patients reacted to the board positively. The mode of operation (i.e. reading the journey, addressing touchpoints, placing pawns) came naturally since the interaction modes of a board game are near universal. All participants reacted to the board with interest and, as some chuckled with the comprehension that it was a “game”, they were drawn to the comprehensive picture it presented of their treatment. During the interviews both the interviewers and patients used the board by placing their finger on specific points when discussing those treatment phases. Most participants reacted to some pictures by explaining their experience with the places, people or artifacts represented in them. Thus, for each participant, the game board became a platform for expressing their individual experiences of the treatment.

Another aspect of the game board is its utilization within the organization as a tool for communication and collaboration. Initially, we printed ten pieces to be used in each interview, but we noticed that we were able to conduct the interviews using the same board. The remaining nine game boards were quickly picked up by members of the staff who were drawn to it for various reasons. Even though we have yet to systematically follow up on the specific reasons for their interest, this signalled that the aesthetic medium was being accepted by the members of the organization. During the staff interviews, many expressed challenges in thinking of the treatment from the patient’s point-of-view. This is largely due to the predominating organization-centric work culture of the hospital. An easily understandable game board visualization assists in turning thinking towards a patient-centric approach. With this in mind, we continued to use the visualization in other parts of the design process, including the presentation of the results of the study. The game board was also included in a design concept as a collaboration tool for future patient-centric planning of hospital work.

6 Conclusions

This paper presented a service design method for assisting in interviewing people with specific constraints, such as difficulties in moving, long periods of service duration and dealing with sensitive themes. The game board method was presented as a design medium, drawing inspiration from the customer journey mapping method and design games. By utilizing aesthetics and interaction modes from games, the method became accessible and engaging and allowed for the exploration of sensitive and personal themes in the patient experience.

The method can be further developed through utilizing it in different contexts and design phases. For example, we propose that it can significantly assist collaboration in co-design workshops with stakeholders with no prior knowledge of the customer journey as a method. We welcome further development of this method with the inclusion of different game interactions, additional props, rules or aesthetics.

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Co-designing an SMS service for London's homeless people

Considerations for designers engaging with a vulnerable user group

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Abstract

This paper reports the challenges of designers developing an SMS service for and with a vulnerable user group, homeless people, and their supporting agencies in London. It also describes the deployed methods in the design process. Co-design activities were performed with homeless people in and outside their living environments such as streets, a hostel and a day centre. The first author engaged with them as an insider (volunteer) or an outsider (designer or facilitator). This paper highlights how co-design activities in the inside and outside environments of a vulnerable user group affect the engagement of this group. Furthermore, the paper discusses ethical issues and the different roles (insider-outsider, volunteer-professional) designers are confronted with in this particular situation. We finally recommend designers to allow participants to share ownership of the project and carefully consider their capabilities of engagement.

KEYWORDS: Service design; Co-design; Participatory design; Vulnerable user group; Homeless people.

1 Introduction: designing a service with a vulnerable and marginalised user group

This paper reports the insights gained from co-designing an SMS service for and with homeless people in London. It answers and discusses the question how designers can approach a co-design project with vulnerable and difficult to engage people.

Homeless people are often qualified as a vulnerable population because of problems and circumstances they are experiencing. Homelessness stems from innate problems of individuals such as mental illnesses and substance misuses. Also, situational characteristics such as immigration issues and relationship brake downs cause homelessness (Ensign, 2003). Homeless persons that are stigmatised refuse to seek support from their personal contacts and institutional supports. They are inclined to highly move around in the city (Jonsen at al., 2007). Due to these problems it is hard to reach homeless people to provide them the right support and it is difficult to involve them in public participation (Brackertz et al., 2005).

During the project, we identified different environments where homeless people inhabit, which are day centres, homeless hostels and streets. Day centres are building based services, open from morning to early afternoon. They provide the services including fulfilling basic needs such as feeding people, providing showers, laundry facilities as well as training and supports. Homeless hostels provide temporary bed space for the homeless. Homeless people spend significant time on streets. Soup runs, which serve food and refreshments that are targeted to feed the homeless on the streets, arrive at specific time and places. Each environment has their own politics that regulate the accessibility and behaviours of the homeless users. For example, homeless people are only allowed to access day centres or hostels when other institutions refer them. During the design process engagements with participants occurred both inside and outside of these environments.

Service design has emerged over the past decade. Different propositions of the term 'service design' are found in related disciplines such as management and design however, yet there is no agreement on its definition. In management

literature, services are often described as the counterpart of goods (products), which are the outcome to a manufacturing process. Vargo and Lusch (2004) introduce a concept 'everything is service', which defines service as a process of involving the consumer as a co-producer to maximize customized offerings. Management researchers have advanced knowledge about how organizations manage services but less understanding on how to design services (Kimbell 2011). Design discipline understands that service design shares commonalities with Interaction Design as they focus on experience, a time based medium and system thinking. However, designing services relates to a broader area including business and strategy, partially including interactive artefacts (King 2011 and Holmild 2007). Service Design also has a strong relation to Participatory Design (Holmild 2009). Participatory design approaches are developed and applied to involve the participants in the design process, implying that the design practice would incorporate the capabilities, dreams and wishes of the intended users (Sleeswijk Visser et al. 2005). According to the categorization of co-creation and co-design practices by Mattelmäki and Sleeswijk Visser (2011), our approach to the user group is positioned in the most complex type of engagement in which diverse stakeholders, not just users are involved in a collaborative process. However, when working with vulnerable and marginalised people, such as homeless people, extra attention should be paid to engage with them (Patton, 1999).

Developers and practitioners of Participatory Rural Appraisal techniques developed for the understanding of poor people living in rural areas distinguish the 'outsiders' from the 'insiders' and emphasize the importance of an open-minded attitude, the use of local materials and the empowerment of the 'insiders' (Chambers, 1997). From the evaluation of design projects for poor people in rural areas we also know that we need to adjust our techniques deployed in participatory design, e.g. due to language barriers, educational and cultural differences (van Boeijen and Stappers, 2011). However, our user group, the homeless in London, have different characteristics that need a specific approach. This paper highlights the considerations involved in the engagement of this hard-to-reach user group in the design process.

In section 2 the case, Homeless SMS project will be introduced. Section 3 will describe how relationships with homeless participants were established. In section 4 the three steps of prototyping the SMS service and the involved challenges will be described. Lastly, we will discuss the lessons learned from this case and end with suggestions for designers who will co-design in similar situations.

2 Case: Homeless SMS

This project aimed to create a mobile SMS service, which transfers relevant information to the homeless users and facilitates supportive social interactions within the involved users such as the homeless and former homeless and the general public. From our research, 70% of homeless people in London own a simple type of mobile phone. The service uses Twitter to mediate communication between involved users and to send SMS to the mobile phones of homeless users.

To execute participatory design with the homeless, we spent considerable efforts to establish the relationships with potential participants through contextual research and a design workshop. After that, iterative service prototyping was performed with the involvement of more than 25 homeless participants and a homeless day centre. Figure 1 shows the prototypes of the service. As a result, a service plan was consolidated.



Figure 1 The prototypes of the service, including instructions for users.

3 Project approach part 1: Establish the relationships

As an outsider, when starting the project, designers do not have sufficient knowledge and empathy with the user group. Therefore, the author spent significant time and efforts to establish the relationship with the homeless, before engaging with them to perform co-design activities. The contextual research, taking six weeks, began with the designers engaging in the environment where potential participants were hanging around. The research allowed us to understand the unique way of life of homeless people and to feel comfortable to approach them. Also, as the research subjects got along with the 'outsiders', it helped potential participants build a trust with the outsiders. The activities were rolled out in two steps: first, designers became insiders by volunteering and at the same time by doing observations and secondly, participants left their environments and were invited to a new setting (a design workshop), which was arranged by the designers.

3.1 Becoming insiders: volunteering and immersive observation

The first contact with homeless people was made by the designer's engagement in volunteering at a *homeless hostel*. When doing the volunteering, permission from the authority to conduct research with their guests was needed. At the same time, the designer-volunteer was required to follow the list of rules regarding engaging with their service users; volunteers are not allowed to contact guests at the outside of the building, to exchange personal contacts and to provide any material supports without permission of authority. Later, these rules often conflicted the way the designers wished to conduct the co-design practices with the participants, who are the service users as well. Another way to become an insider was to engage in an observation of rough sleepers, which allowed the designer to immerse into the environment of *streets*. Several full days were spent with the subject sleeping rough, from early morning till late night when they went to sleep.

The engagements of becoming insiders provided valuable benefits: the project team gained on-going contacts with homeless people, who participated in the project. Also, the designer was able to develop an empathy with them. Homeless people trusted the designer, as they perceived him as a volunteer as well, which

was the prerequisite quality for participating in design process. However, this way of engagement required the designer substantial time to be in the inside and the accompanying risk of burnout because of confronting the difficult lives and circumstances that many participants experienced.

3.2 Inviting participants to the outside: a workshop



Figure 2 A scene of the co-creation session.

After the contextual research phase, the project team conducted a co-creation session in order to get insights in developing the service (see Figure 2). The session recruited eight people who represented the stakeholders of the service concepts; two homeless, two former homeless, one volunteer and one outreach worker were selected and invited to the workshop. They all have substantial experience involved in homelessness yet hold different perspectives. During the session, the service concept was presented with storyboards. Participants understood the idea and freely gave their opinions on it. Furthermore, they performed a design activity to ideate a mobile tool to communicate with and that supports homeless people: the participants were excited in ideating possible solutions beyond informing problems.

Inviting participants to an intended setting outside of their regular environment and stirring their imagination allowed the participants to feel owner of the project. This secured the participants' interest on the project and motivated them to further engage with the project. However, performing the workshop with the homeless participants at the outside of ordinary environments infringed the regulations given by the service provider, which permission the designer needed.

4 Project approach part 2: Prototyping the service

Prototyping played a pivotal role in bringing the concept to life. The service-system was incrementally evolved through three iterations of prototyping. The prototypes did not attempt to actualise all aspects of the design. Rather, they were manifestations of selected ideas and manageable interventions to the reality of participants. Each prototype contributed to important design decisions in terms of choosing a technical platform, identifying core functionality and communicating with users and service providers. Three iterations were laid out, which differed in their purposes and user groups involved. They are named (1) Discovery of limitations (of initial concept), (2) Co-creation (of the service concept) and (3) Implementation (of the service design).

4.1 Discovery of limitations

The first prototype tested the initial service concept that enabled the homeless to find local homeless services and to get regular updates of useful information. The both functionalities were delivered to the users via SMS. To conduct the prototype we recruited 11 homeless people both at the hostel and the streets in central London. They agreed on using the service and provided feedback after a couple of days but they were not offered any incentives. However, we could not achieve the results we intended, because only 2 out of 11 recruited participants kept their engagement and gave us feedback. Despite of this failure, we learnt important lessons to secure the engagement with the participants: first, designers need to choose the right environment to recruit homeless participants. The people recruited from the street were not reachable to get feedback. Many homeless people on the streets have a regular area in which they stay however, during a day, they are always moving and hard to locate. The participants at the hostels were easily revisited as they were based at the shelter throughout the test. This suggested that the streets are not an appropriate place to recruit participants to secure their engagement to the pilot service. Secondly, we experienced the need to encourage the participants' engagement to use the prototype. Taking the attention of homeless people to explain the idea of it and the benefits of the participation was very difficult. Many homeless people directly refused participation when they heard about the prototype service.

4.2 Co-creation

The second iteration aimed to test the main functionalities of the service-system and to see how it could be accommodated by the social networking service Twitter. The prototype used the Twitter's mobile service enabling, users to operate most of its features by SMS.

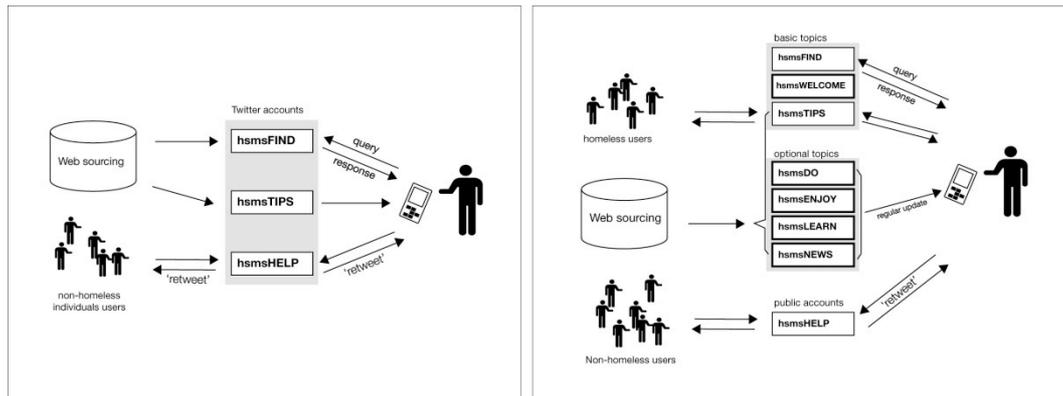


Figure 3 Second prototype of the service (left, initial status; right, final status)

Figure 3, left shows the initial communication structure of the prototype and right shows the final result of this phase. It started with three basic Twitter accounts including @hsmfIND, @hsmTIPS and @hsmHELP, which accommodate different functionalities. After prototyping, more accounts were created in order to deliver specific information to the users and enable them to select relevant information that fitted their interests and circumstances. This included the accounts delivered useful information such as weather forecasts and opportunities on education and training.

Based on the lessons learned from the first iteration, we found a need to continue the participation with the 'engaged user group', asking for their opinion about the design decisions. To do so, six homeless persons were selected. All of them were recruited from the homeless hostel and three of them already participated in the design workshop. They agreed to participate in the project at least for one month and to provide feedback through individual and group sessions. In return, we offered them a prepaid SIM card or a voucher of £10 mobile phone credit. This enabled them to send text messages for the following month in order to fully make use of the prototyped service. It also provided an extra 100 minutes call time as a bonus.

During the prototyping, they were invited in individual and user group sessions. Designers and participants discussed the detailed features of the messaging service. This included the information that should be included in a single message, the type of contents of the message that would be useful to users and the geographic boundary that one user would be willing to visit when receiving an opportunity in the city.

4.3 Implementation

The service concept consolidated in the Co-creation phase was implemented in a homeless day centre in central London. The results of the previous prototype helped to convince the organisation and created the partnership. The prototype aimed to test the consolidated service concept with a larger number of users and to figure out how the existing service providers could be involved in the communication channel. To do this, a dedicated Twitter account was set up, which provided a direct communication channel between the organisation and its clients. In total 18 participants joined the service, using the day centre services. In order to encourage clients to sign up to the service, a participant who successfully registered to the service was given a lunch voucher as a reward, with a value of £2. This incentive was effective and powerful, raising their attention, which provided the opportunity to explain the details of the service further.

5 Conclusions & Discussion

This paper documents the ways designers engage with homeless participants in order to co-design a service. We highlight lessons learned and discuss possibilities for designers for co-design with and for vulnerable user groups.

- 1) Designers need to be aware about the *extent of engagement* with the participation of homeless, both inside and outside their environments.

According to the purpose of intended activities, the designers needed to decide whether they wanted to establish the participation with homeless people inside of their familiar environments or bring them outside their existing settings (see Table 1). Practitioners of Action Research in a health care sector have reported this tension caused by their roles as both an insider (participant/ volunteer in this

project) and an outsider (researcher or facilitator/ professional designer in this project) of the organisations (Williamson & Prosser, 2002 and Coghlan, 2001). Titchen and Binnie (1993) established practiced ‘double-act’ as researcher and change agent in order to overcome similar difficulties.

Table 1 The environments of the participation with homeless people.

| Activities | The participations’ environments |
|----------------------------------------|-----------------------------------------|
| Volunteering and immersive observation | Inside (streets and hostel) |
| Workshop | Outside |
| Co-creation | Outside |
| Implementation | Inside (day centre) |

Each environment has its own authority and culture to regulate the way homeless people behave. When a designer engages with participants under a certain setting, they need to follow their rules, such as the time and place they are allowed to engage with them. However, being under one’s authority strongly restricts the freedom of co-designing activities. For instance, during the Co-creation phase the participants were invited to the setup and environment that suited the purpose of the workshop. Besides, the authority might not appreciate the agenda of the service. To do this, the designer needs to carefully communicate with the manager of the relevant service providers to gain permission of engagement outside of their supervision. This means that the designer takes higher responsibility of the participation, especially when taking into account the vulnerabilities of the user group.

- 2) Designers will be confronted with *ethical issues* related to the participation with the homeless.

Bringing the homeless participants into the design process causes critical ethical issues to designers. First, designers need to play different roles, which are often conflicting, and sometimes not possible to make transparent to the user group and involved parties. When engaging with the participants inside the service provider, the designer’s role was a volunteer, who helps the service users by performing the given task. However, as a designer, he was intended to gain

access to the user group and build on trust. The relationship with designers and the homeless people was personal and their attachment could be developed along the time of engagement. However, when designers perform design activities with the participants, the relationship is more hierarchical. Especially, the first author established a friendly relationship with the engaged user group through regular volunteering at the hostel, and this seemed to encourage them to participate in the design activities. This brought a 'guilty feeling' to the designer, because the personal relationship is being instrumented for the design project. Furthermore, the participants cannot avoid uncertainties during the design process, which is potentially harmful to vulnerable people. When designers ask the homeless for consent of engagement in co-design activities, the outcome is not clear in advance, which is inherent in design processes. These vulnerable participants have less capacity to handle mistakes caused by prototypes. Finally, the contribution of participants is difficult to award appropriately. Providing incentives to participants can encourage them to engage however, this does not sufficiently cover their time and efforts.

3) Possibilities for the designers

- Allow participants to have *ownership* of the project.

Enabling the participants to have ownership of the project would be a possible solution to address the problems of rewarding and coping with the uncertainties of participation. Arnstein (1969) defines the level of citizen participation in accordance to the extent of citizens' power in determining the end product. She separates 'tokensim' from the genuine participation, which allow participants to have a voice but they do not have power to decide. This implies that co-designing practice could go beyond allowing participants giving their opinion and aims to enable users perceive that their engagements are the main part of the product itself. Participants need to understand their value in the design development, which make them more proactive in their participation. Involving users in workshops that encourage them ideating possible solutions is a first step to stimulate this sense of ownership.

- Consider participants' *capacities* when engaging them in a design project.

Users who participate in a co-design process are asked to adapt their behaviour, for instance when testing a prototype. This means that designing is an intervention in the participants' real lives. Designers may underestimate this, because they consider prototypes as a representation of a concept, that is not part of their real lives yet. Therefore, when rolling out co-design practice, designers should carefully consider each participant's capacities of coping with any changes that the design intervention would bring to them. Here, the participants' capacities imply not only their limitations but also capabilities. Designers need to have eyes to discover what potentials the participants have and transform them to the appropriate design activities.

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User Experience Analysis in Service Co-Creation: A Living Lab Approach

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Abstract

The social and psychological analysis of the Human-Computer-'Thing' (H-C-T) interaction that occurs within an IoT (Internet of Things) service or application environment encompasses emotional, empathical and interpersonal aspects. We propose a Living Lab approach to evaluate these, and introduce to this purpose a novel measurement framework, built on an ontological model and resulting into an appropriate taxonomy of indicators. An experiential platform is currently under development, whereby users are directly involved in co-creating, exploring and experimenting new ideas, concepts and technological artefacts related to IoT applications and services. Experimentation is under way within three European Living Labs, each composed of a physical place, an information architecture and a societal space (user community). Various usage scenarios are concurrently taken into account in three different domains, namely Logistics, Health/Wellbeing and Green services.

KEYWORDS: IoT (Internet of Things), HCI, HCT (Human-Computer-'Thing') Interaction, Living Lab Approach, Experiential Platform

Introduction

Recent reflections conducted both at theoretical and practical level highlight the fact that a social, as well as a psychological, dimension is implied by the analysis of the Human-Computer-'Thing' (H-C-T) interactions that occur within an IoT (Internet of Things) service or application environment. Leveraging on these interactions, one can think of improving and/or refining the assessment of an IoT service/application, by means of:

The collection of experiential data regarding the ability of the researched IoT service/application to generate personal rewards for the user; rewards that can either be expressed in qualitative terms (e.g.: Poor, Fair, Good, Excellent) or with quantitative means (e.g. by normalised scores), to be compared along various observed instantiations with the progress of time;

The formulation of analytical judgements on the specific aspects of H-C-T interaction, in terms of behavioural intensity and persistence; judgements that can provide guidance for further improving the IoT service/application at hand.

Unfortunately, a well-known limitation of social and psychological research (see Polkinghorne, 2005) is that data about human experience is not comparable with data about human behaviour. Because experience is not directly observable *per se*, data about it depends on the people's ability to reflectively discern aspects of their own experience and effectively communicate what they perceive through the symbols of language. As a result of the above limitation, a combination of experiential with verbal data – the former obtained by monitoring the interaction of human beings with the external world and the latter from direct reporting of involved actors – has been proposed to derive the most complete, realistic and meaningful representation of a given social environment (Andrews et al. 2009).

This intermediate approach to gathering information on personal experience may prove impractical, however, particularly in virtual communities – whereby the collection of inputs is “filtered” by a Human-Computer interaction (see Suchman 1987) that protects anonymity and dilutes feedback over time – not to speak of the case of “non verbally communicating actors” (such as children), who can be of little help in providing any rationale for their documented actions.

This paper introduces an alternative approach to user experience analysis (see Forlizzi and Ford, 2000; Forlizzi and Battarbee, 2004) that is currently under development in the context of a EU funded ICT research project, ELLIOT. The

proposed action workflow is based on the mapping, recording, and interpretation, of the (one-off or recurrent) behaviour of actors, in association with a range of emotional, empathical and interpersonal aspects that are deemed to be relevant for the context of analysis. Acting in this way, one can approximate and ultimately measure, albeit in terms of variations between AS-IS and TO-BE parameters and indicators, some key psychological and social dimensions of human interaction that would remain otherwise obscure (Schachter and Singer, 1962; Desmet, 2003). An experiential platform is being tested and validated in support to the action workflow, whereby users are directly involved in co-creating, exploring and experimenting new ideas, concepts and technological artefacts that are particularly related to IoT applications and services. Experimentation is under way within three European Living Labs, each composed of a physical place, an information architecture and a societal space (user community). Various usage scenarios are concurrently taken into account in three different domains, namely Logistics, Health/Wellbeing and Green services.

This paper is structured as follows: Section 2 (“Background”) presents the ideal type of social behaviour that is in the focus of our present research. Section 3 (“Vision”) outlines the Living Lab environment used as reference framework for experiential measurement. Section 4 (“Action Workflow”) briefly summarizes the three-staged action workflow being used for project trial configuration. Section 5 (“Implementation”) describes the three testbeds and the preliminary feedback collected from them. Section 6 concludes the paper.

Background

To further clarify what our research is about, let’s look at the following picture.

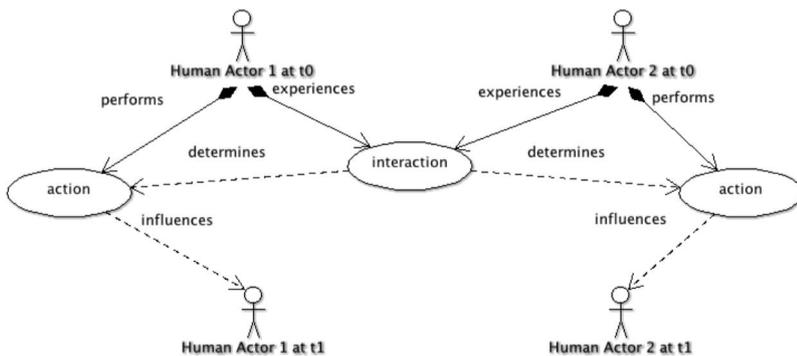


Figure 1 The interaction / action ideal type of social behaviour

What the diagram represents is an ideal-type *interaction* between two human beings, Actor 1 and Actor 2, who are taken in two consecutive moments of time (t_0 and t_1). At t_0 , each of them gets her or his own contingent *experience* of that interaction, which we provisionally assume to be immediate, i.e. without any mechanical or instrumental “filter” (like it happens in CMC, Computer-Mediated Communication). After that or in light of that experience of interaction, some kind of *action* is performed, which leads every human being represented in this picture to reach a different mental and/or physical status at t_1 .

Thus, *the focus of our research is set on the power of experience in driving and ultimately changing personal behaviour.*

However, this experience is not limited to immediate (face to face) interaction between two or more people, but extends itself to a number of possible scenarios where computers, and eventually “things” (in the meaning assumed by this word in

the IoT context), interact with human beings and shape their individual and collective behaviour (see Latour 1996, Hassenzahl 2003), like the following picture shows.

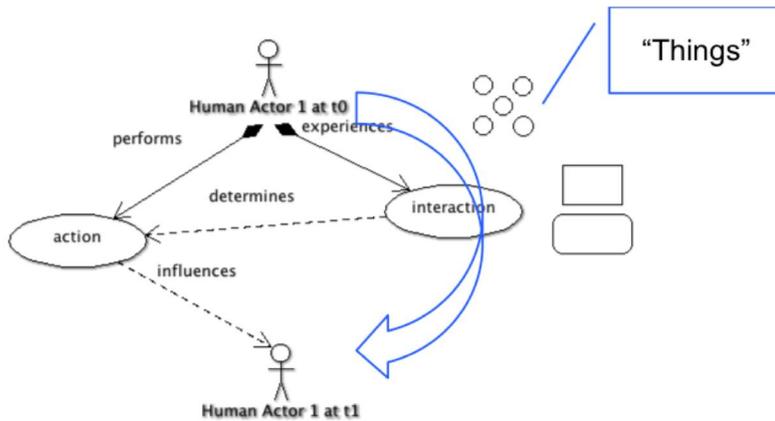


Figure 2 The

H-C-T interaction / action ideal type

There are several problems with analysing this type of behaviour, however. The most important one is that any person's experience of whatever material or immaterial object is not knowable or measurable per se, but only through the adoption of one or more "proxies" – like it happens when questionnaires to measure individual satisfaction are distributed. Another related issue is that whatever the initial opinion of a person is when the experience is fresh, his or her memory tends to decay very fast over time. This explains the success of online and particularly mobile user surveys, which try to document personal reactions and feelings going as close as possible to – if not right at the point of – experience. Moreover, surveyed opinions tend to converge towards each other when they are openly expressed, particularly if people are interviewed sequentially rather than in parallel. A variant of this latter statement is that 'context' broadly influences subjective perception, including in this term ('context') all kinds of personal interference and social contamination that one can possibly imagine (see Kolb et al. 1984; Winner, 2007).

Vision

Among other issues, Social Computing as a theoretical discipline deals with the study of contextualised social behaviour within very special environments that are infrastructured by IT systems. As such, it takes benefit from both ideal types of person-to-person communication and of H-C-T interaction depicted above (see Abowd et al., 2002). However, the research focus is currently set more on the joint outputs of this combination (e.g. crowdsourcing, "wisdom of the crowds" – Surowiecki 2004) than on its outcomes in terms of behavioural transformation of the people involved in it. In our vision, this prevents from displaying the full potential of user experience analysis for the assessment of used services and/or applications (Novak et al., 1999; Sengers and Gaver, 2006).

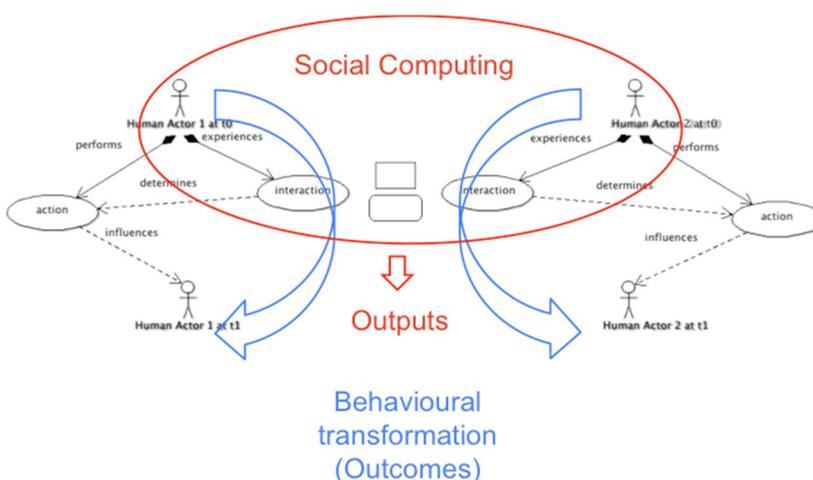


Figure 3 Social Computing and behavioural transformation

In our research, we adopt the Living Lab approach (Mulder and Stappers 2009) to frame and analyse the outcomes of H-C-T interaction for the sake of service co-creation. Living Labs are open innovation environments in real-life settings, where user-driven design and experimentation are integrated within a co-creation process of new services, products and societal infrastructures. Our business case refers to the *collection and measurement of experiential data aimed at the design, development or adaptation a (public or private) IoT service or application in close cooperation with the end users*, as the following picture represents:

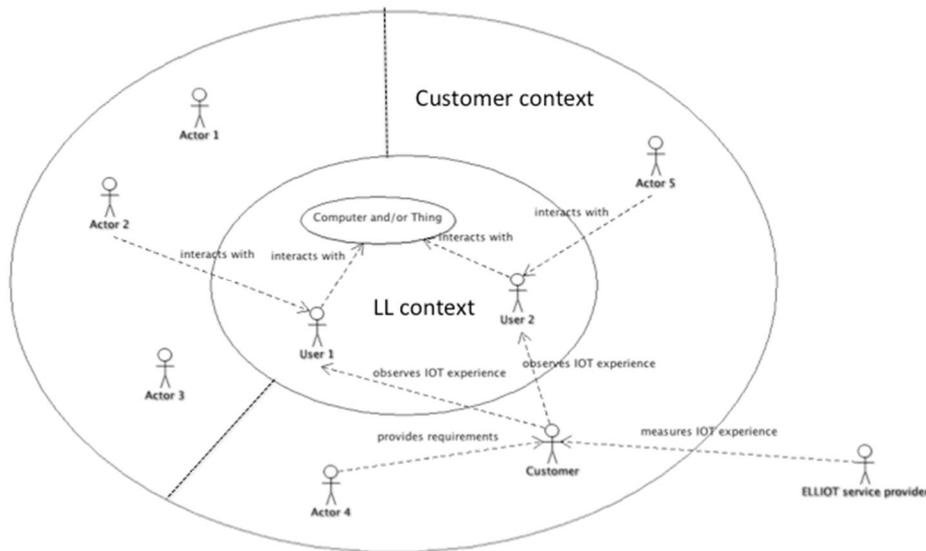


Figure 4 Stylised representation of the business case

The inner circle is the proper Living Lab environment, whereby people interact (among themselves and with external actors, but also) with computing hardware and software (e.g. a game console, a speed meter or a food vending machine) and/or “things” (e.g. sensors, video cameras etc.). The external circle, which we call the Customer context, normally includes the former from the perspective of (business) localisation, and is the one where the commercial relation with the ELLIOT service/solution provider is established. We posit that the identification of all relevant actors in a Customer environment is decisive for proper design and initialisation of a use case scenario, especially because the Customers do often provide and specify their own requirements for the most appropriate trial configuration.

Action Workflow

As stipulated above, the personal experience of a given Living Lab environment (like of any other human environment) is not knowable or directly measurable *per se*. However, as there is some relation between the experience of interaction and individual or collective action, the issues that emerge here are twofold:

First, how to derive meaningful information on the individual and collective H-C-T experiences by means of appropriate “proxies”;

Second, how to attach economic value (significance) to this kind of information.

Both aspects can be pragmatically arranged through an appropriate trial configuration, driven by the Customer’s business objectives.

In our approach, a solution to the above is provided by a three-staged action workflow, based on:

Concept mapping (general and context independent). Defining the key Social Experience aspects taken as 'leaves' of a taxonomy 'tree'

Association of Indicators to Concepts (part of the IoT Living Lab trial initialisation)

Association of Metrics to Indicators (both specific and context dependent).

To every 1st tier attribute (for instance: an emotional aspect providing social reward) a number of 2nd tier dimensions can be associated. For each 2nd tier dimension, a number of KPI's (Key Performance Indicators) and their related metrics can be designed and the IoT Living Lab trial is configured accordingly.

In the next table, we expand the 2nd tier dimensions of the Social Experience model.

| Social Reward Indicators / Metrics (examples) | | |
|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Emotional aspects | Empathical aspects | Interpersonal aspects |
| - Satisfaction -- Shortened session time → Number of early log outs -- Reduced complaint rate → Answers to online surveys | - Pleasure -- Extended session time → Session duration -- Increased approval → Answer confirmation rates | - Involvement -- Participation rate → Number of users -- Participation intensity → Average connection time |
| - Amusement -- Returning visitor's trend → Same user's hits / logs -- Increased appreciation → Voice / VCC recordings | - Interest -- Traffic intensity → Number of hits / logs -- Level of attention → Eye tracking records | - Communication -- Intensity of dialogue → Number of posts per thread -- Promptness of feedback → Response lag time |
| - Enthusiasm -- Word of mouth → Measurement of outcomes -- Proactive behaviour → Effectiveness of engagement | - Surprise -- Uncontrolled reaction → Number of outliers / incidents -- Changed approach → Frequency of path deviations | - Collaboration -- Amount of co-production → Items per team / thread -- Timing of results → Average lead / lag time |

Proceeding from left to right in the table's first row, we introduce the distinction between Emotional Aspects (or pertaining to the intimate sphere of a person, and dynamically changing over time as a result of his/her level of "immersion" in the Living Lab's environment), Empathical Aspects

(referring to the willingness and capacity of a human being to establish and maintain a purposeful connection and exchange with the external world, which can translate e.g. into the execution of tasks and/or the manipulation of objects, including hardware and software), and Interpersonal Aspects (focused on the various possible degrees of interaction with the other human beings that make up the social context in which the person is immersed, and that can either be filtered or not by computing machines and/or IoT devices).

Implementation

This section describes in some detail the three selected experimentation domains of our field research and the preliminary inputs received from the corresponding use case scenarios.

Logistics

The main goal of this use case is to apply IoT technology within logistic processes to enhance efficiency and reduce complexity for operational workers. The chosen example is the (AS-IS) process of a fork lift truck picking up a pallet containing a specific load and moving it to the correct location within a high bay racking. Starting from this process observation, a requirements analysis is performed, which is necessary for the enhancement of the process itself thanks to the adoption of IoT solutions. For the use case actualisation, an IoT construction kit will be provided with several ARDUINO based sensors. The goal of IoT support is, on the one hand, to reduce potential failures and sources of error, and, on the other, to increase process efficiency and increase its level of safety for the workers attending it. These workers, together with managers and experts in the field of IoT, populate the Living Lab and develop relevant ideas and knowledge in a co-creative manner. Based on the knowledge gathered in the Living Lab and on the analysis of the specific ideas developed to enhance the process, different IoT solutions will be built using the ARDUINO construction kit. Then, after their implementation,

the solutions will be tested and validated by the people in the factory, till they are permanently adopted within the given process.

Results and Implications

The service co-creation process is supported by experiential information to be collected and interpreted throughout the project trial (experiential data, usage data etc.). In particular, the following table maps the objectives of this information gathering, in relation to the main process stages and to the key social aspects of H-C-T interaction:

| Stage No. & Title | Description | Social H-C-T aspects | Objectives of information gathering |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------------------------------|
| 1. Process and Requirements Analysis | Participants understand the requirements of the current logistic process and state the areas that will most benefit from IoT technology support. | Interpersonal aspects | Attendance rate Patterns of collaboration |
| 2. Knowledge Generation | Participants increase their knowledge on which they are going to base their ideas and concepts for the deployment of an IoT supported logistic process. | Interpersonal aspects | Feedback on behaviour (AS-IS) or behavioural change (TO-BE) |
| 3. Idea Generation | Participants develop new ideas for enhancing the process using the ARDUINO construction kit. | Interpersonal aspects | Patterns of collaboration Success rate |
| 4. Concept Development | The idea(s) chosen are turned into a fully-fledged concept for IoT adoption within the given factory/industry. | Interpersonal aspects | Patterns of collaboration Adoption rate |

Health/Well-Being

This use case supports an extended concept of "Wellbeing", based on the following scenarios, in which a set of services are made available for the promotion of wellbeing and healthy lifestyles of all citizens:

TV for Paediatrics

Interactive Vending Machine

Intelligent Cycling

Public Transport Information

In the *TV for Paediatrics Scenario*, children hospitalised in a paediatric department are provided with a touch screen TV monitor. Children are usually anxious during their hospitalisation, and the provided system is seen as an aid and comfort thanks to the availability of an extensive communication support. Children are allowed to use the Internet, play videogames and attend school lessons. All the performed choices are recorded and the healthcare professionals (or the parents themselves) have the control of what the children are allowed to do.

The *Interactive Vending Machine Scenario* offers to adult people an opportunity to reflect and react on the benefits related to healthy living through the deployment of an innovative system for the automatic distribution of food and beverage. The Vending Machine does not only provide goods but becomes an educational tool to gather and entertain people, while increasing the awareness and providing motivation to adopt a healthier lifestyle.

The *Intelligent Cycling Scenario* is based on a Web Portal (www.vainbici.it) that was conceived for the promotion of initiatives aimed at a healthier and more environmentally friendly lifestyle, as well as the provision of services for pedestrian-cycle mobility. Their outcomes include: *i*) incentivising the use of the bicycle, *ii*) motivating the bikers to create a social network and to adopt healthier and more environmentally friendly lifestyles, and *iii*) promoting the territory and the tourist

services available¹. The Portal allows exchanging and sharing information and digital content related to the world of bikes and cycling, including audio-visual multimedia content.

The *Public Transport Information Scenario* includes the provision of advisory services for all users of an automatic shuttle that connects the City metro line to the Hospital. The aim is to support patients and improve the mobility of visitors, staff and students in their travel to and from the Hospital. Among other functionalities it will be possible to query the IT system to obtain travel information from remote devices.

Results and Implications

The four scenarios are all supported and enhanced by experiential information to be collected and interpreted throughout the project trials (experiential data, usage data etc.). In particular, the following table maps the objectives of this information gathering, in relation to the main process stages and to the key social aspects of H-C-T interaction:

| Scenario No. & Title | Description | Social H-C-T aspects | Objectives of information gathering |
|--------------------------|-----------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------------------------------------------------------------|
| 1. Media | Children use the Internet, play videogames and attend school lessons | Emotional aspects | Patterns of service usage Feedback on service |
| 2. Personalised Services | Adults receive advice on healthy lifestyles while buying food at the vending machine via LCD touch screen panel | Empathical aspects | Patterns of service usage Feedback on behaviour (AS-IS) or behavioural change (TO-BE) |
| 3. Tourism Services | Participants engage in a social network and a portal for the promotion of cycling | Interpersonal aspects | Patterns of collaboration Feedback on behaviour (AS-IS) or behavioural change (TO-BE) |
| 4. Public Transport | Visitors ask and receive travel information on their mobile devices | Empathical aspects | Patterns of service usage Feedback on service |

Green services

Two types of green services are included in the use case: a mobility service (with a vehicle based scenario) and a wellbeing service (with a green watch based scenario). Both of these are based on fixed and mobile sensors. In both scenarios, the objective is to study the impact of citizens' awareness of environmental data provided by IoT devices or by personalised alerts on their decisions related to:

Transportation (modes, paths, destinations or times)

Mobility (in relation to air quality patterns).

Results and Implications

The use case is grounded on an original methodology, which is articulated in three complementary approaches, each being supported by the experiential information to be collected and interpreted throughout the project trials (experiential data, usage data etc.). In particular, the following table maps the objectives of this information gathering, in relation to the main process stages and to the key social aspects of H-C-T interaction:

¹ Such as: bike-specific roads/paths, address books or informative and educational deepening, the geo-database with all the information about the cycle paths (GPS circuit and altimeter's profile), the geographic localization of all the services available on the territory (hotels, hospitals, parking, restaurants, shops, museums...)

| Approach No. & Title | Description | Social H-C-T aspects | Objectives of information gathering |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------------------------------------------------------------------------------|
| 1. Participatory/user-centred design methods (for the co-creation of global process) | Cognitive walkthrough, online or face-to-face focus groups, workshop on paper-based mock up, etc. | Interpersonal aspects | Patterns of collaboration |
| 2. Diary studies for IoT experience elicitation during usage | They make experiential learning more explicit and are suitable for the longitudinal aspects of the use case as it is intended that experience should be gathered with IoT over a period of time and not as a one-shot trial. | Empathical aspects | Feedback on behaviour (AS-IS) or behavioural change (TO-BE) |
| 3. Coupled quantitative and qualitative approaches for portal usage analysis, to allow the identification of patterns of service usage and the elicitation of an informed rationale for the observed patterns | May include content analysis, social network analysis and other analyses that are relevant in understanding technology acceptance. May also include questionnaires on attitude changes. | Interpersonal aspects | Patterns of collaboration Feedback on behaviour (AS-IS) or behavioural change (TO-BE) |

Conclusions

The above considerations are being implemented into an Experiential Platform, designed and developed to explore ICT/IoT enabled human interaction, including its validation as well as the corresponding impact evaluation (see McCarthy and Wright, 2004). This Experiential Platform will operate as a knowledge and experience gathering environment in the IoT context.

Acknowledgments

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Ideation of IoT services with citizen: coupling GenIoT and AloHa! methods

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Abstract

This paper introduces a methodology for designing service concepts in the specific paradigm of the Internet of Things (IoT). In the frame of the European project ELLIOT - Experiential Living Lab for Internet Of Things -, the Living Lab ICT Usage Lab aims at co-creating "green" services, i.e. services based on air quality and noise measurement. These services are invented in an open innovation setting, by a set of stakeholders and not a given service provider. In this context, the ideation methodology has two main requirements: to design services deeply rooted in people routines but impacting people lifestyle and to design services potentially embedded in the Internet of Things.

The novelty of the methodology lies in the coupling of two ad-hoc methods: 1) GenIoT, a method articulated around a generative technique where "designers" are asked to place probes (fake sensors and/or actuators) in their daily environment, i.e. the target service area, and to report on it to the group, and 2) AloHa!, a bodystorming method enabling "designers" to play not only characters but also intelligent objects in order to co-create service scenarios. After a description of these complementary methods, we provide the first results on the application of this methodology.

KEYWORDS: ideation, living lab, internet of things, bodystorming, generative technique, probes, green services, idea generation, co-creation

Introduction

Internet of Things (IoT) is supposed to be a physical world where everyday objects, rooms and machines are connected to one another and to the larger digital world. In this web of people and objects, individuals as well as things will have their own unique URL and, according to interactions between all these entities, social networks will be articulated with a ring of connected objects. This mash up of "hyper groups" and "hyper objects" will be the next step towards a deeper level of automation in which the user interface has vanished, the explicit control over the world is no longer the rule and where the users will have to understand the dynamic changes of their environment in relation to their social interactions and to their physical behaviours.

The design of IoT based services therefore raises many challenges related to the user experience and requires a deep understanding of users' needs in their real life environment as well as many field experiments; this is why the Living Lab approach appears as the qualification device which has been lacking so far.

Air quality and noise are environmental parameters that do impact people's lives. "Green services" aim at changing citizen behaviours so that they improve the quality of life both in public and private settings (for instance by modifying their transportation patterns or adapt their sport-related behaviour). Citizen, but also city representatives, artists, medical, childcare, transportation, computer and entrepreneurship professionals from the Living Lab ICT Usage Lab are invited to participate to the co-creation of new "green services", from the ideation to the service evaluation steps.

The variety in the stakeholders profiles calls for the implementation of a range of facilitation techniques in order to satisfy many cognitive and behavioural styles and get the most out of the creative group.

The overall ICT Usage lab process for services co-creation includes service exploration, service concept development, service experimentation and service evaluation, all four activities being concurrently run .

The ideation of IoT based “green services” led us to provide specific solutions to deal with three main challenges.

1. When dealing with IoT based services, the objective is not to impose a given technology to support the service but rather to free designers from any fixation bias related to existing services or technology and let them open and willing to consider the Internet of Things paradigm. As a consequence the method for the service concept development has to enable designers to reconsider objects and daily context with a new viewpoint and foresee new affordances.

2. With the concern of the viability of the service and its “green” aspect, the objective of the service is to raise level of awareness (from perception of the air quality level, to understanding of the impact of the air quality in human behaviour) and insure that multiple viewpoints are represented (included business dimensions), hence the adoption of diary and role play techniques.

3. Considering the customer/user experience of the service concept, the objective is to build a service concept from grounded data and use a generative technique, to emphasis on co-creation, and enact the service in order to reach the stage of identification of citizen touchpoints.

The coupling of GenIoT and AloHa! methods appears to be an answer to such challenges, even if both methods are still in their infancy and still need to be fine-tuned and complemented.

The ideation methodology we propose for generating IoT services with stakeholders starts by an exploration step where all stakeholders –called below “designers” be they citizen, or representative of an institution or enterprise- are exposed to relevant services and technologies (identified from a benchmarking study) and may report individually or collectively on their experience as a user or from any other viewpoint. This objective of this first¹ exploration step is to start the inspiration process and frame the questions to be addressed (namely the relation to air quality, noise pollution).

The next steps take the designers on a journey from individual introspection –required by GenIoT- to semipublic acting, as per AloHa! , via online idea scaffolding. The idea behind this coupling of both methods is to provide designers with multiple supports and experiences in order to maximize the creativity of the group, but also to approach the Internet of Things along the three experiential dimensions: *say*, *make* and *do*.

After these idea generation steps, leading to several divergent ideas, the third step, based on classical face to face sessions, allows the emergence of top ideas that can be refined, combined and elaborated in order to describe a first service concept.

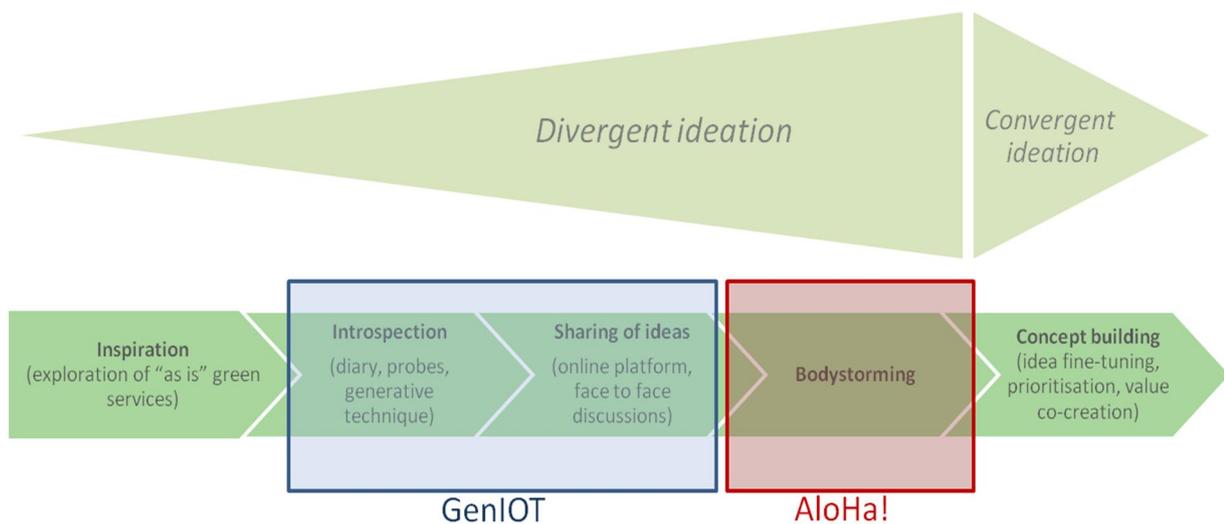


Figure 1 GenIoT and AloHa! within the ideation and initial concept development methodology

¹ More exploration steps will be run for instance during the concept prototyping phase

In this paper, we focus on both GenIoT and AloHa! Methods as parts of the ideation and concept generation shown in Figure 1. We present both methods (procedures, tool kit, expected benefits and challenges) and report on the first results from applying and coupling these methods.

Feedback illustrated is based on a first analysis covering verbal protocol analysis of the transcripts of the workshops (9hours), video analysis (body language analysis), statistical analysis of the content created by the participants in the online tool.

GenIoT

GenIoT provides designers the opportunity to express themselves both via the *say* and *make* dimensions. Indeed, in order to help designers in the ideation process and obtain grassroots findings, the ICT Usage Lab researchers build on the tradition of cultural probes as initiated by Galver et al. (1999) and combine a participatory place-based sensing exercise inspired from Kusnetsov et al. (2010) with a diary exercise and the use of a collaborative idea management tool (Ideastream from <http://www.gi2mo.org/>).

Designers are provided with a toolkit (cf. Figure 2) and required to place sensor probes in their daily environment, to take a picture of the probe(s) and share it with the group. Sensor probes are cubic silicon magnets.



Figure 2 GenIoT toolkit

Duration of the exercise is between 1 and 2 weeks, so that weekly patterns are captured. Designers are also asked to daily record their feedback on the exercise on a paper template (hence the calendar-like form glued on the envelope used for carrying the material). Depending on participants' attitude and practice, pictures can be either posted online to the group (with or without comment) or they can be kept and shared after the exercise during a synchronous face to face meeting.

Toolkits provided to the designers contain fake sensors and paper-based material that could be used to represent actuators (hence the paper "post it" that can be used to describe an action performed). The idea behind the choice of the toolkit is that ambiguity and visual stimuli are the basis for fostering creativity.

The envelope also contains a log in and password as well as instructions on how to post, comment or vote on the collaborative platform.

Expected benefits of GenIoT

This method falls in what Sanders (2000) defines as a generative one and is used, in its application to the ELLIOT green services use case, to force the designers to think about their intimate relation to noise and air quality level, report indirectly about their own life and start the service ideation.

More generally, GenIoT could be used to document the needs, practices and contexts (instantiation of the triad (anywhere, anytime, anything) that IoT could support) in cases where the IoT service relates to a pervasive topic such as energy (eg. electricity), resource (e.g. water) etc.

Please note that this sensor placing exercise does not inform on the technical feasibility or best position for sensors but express the interest in gathering data in a given area and communication of this data.

Increased awareness about IoT potential applications as well as awareness of air quality and ambient noise was indeed the most reported effect of the method during the GenIOT open debriefing sessions (*« Since the first workshop, we are keeping on thinking about it, we pay attention around us.» «When I was walking, I always had a part of my brain thinking: “ah, we could place a sensor here, it would be nice to do this and that” »*).

Another expected effect of this method is related to its public and social aspect: GenIOT could open up the circle of designers and wider the co-creation. It is indeed expected that designers do not only talk about their “homework” to their relatives and/or colleagues but also to their neighbours or any stranger met in the spot where they place the sensors, thereby giving birth to new ideas and acting as a vector increasing the awareness on the application and impact of IoT.

This second advantage was as well reported during the GenIOT debriefing as designers took the opportunity to discuss about air quality and potential actions during family lunches and in the public transportation (*“ There was a group of young people looking at me in the tramway; I explained them what I was doing and really enjoyed this discussion with them; they looked surprised”, “I discussed about it with my wife and kids over lunch and we went on a brainstorming session”*).

Challenges of GenIoT

One of the challenges of GenIoT relates to the engagement in the game. Staying active in producing pictures and willing to share them with other designers requires an continuous commitment that may be difficult to get from all participants. Indeed once designers have been introduced to the rules and given the toolkit, the facilitator has only indirect means to get the designers to do their homework.

During the ELLIOT sessions, while individual participation was satisfying, collective engagement was only partially achieved: the regular emails reminders sent to the group failed to maintain a high picture production/posting and online discussion, as developed below in the experience of the online group process.

The idea management tool could be used for a continuous community management to create and maintain interest in the experiment: designers expressed that they would have appreciated a daily digest of the publication.

Furthermore a good level of trust within the group of designers is required as pictures may relate to intimate settings and self disclosure difficult for some participants.

Designers handled this challenge in a pragmatic way: indeed they framed their pictures in a way that they did not share their intimacy (cf Figure 3 below) .



Figure 3 Fake sensor monitoring the air composition near a candle and changing colour if needed.

Feedback on the GenIOT method

Although a test of the method (with 12 participants) was performed in order to set up the documents, tools and process, we report hereafter insight gathered during a 12 days running of GenIOT involving 11 “designers” –both citizen and local authority actors-. We qualify the attitude and experience of the designers during both the individual and collective ideation, give an overview of the production and instill elements for fine-tuning the method.

Attitude towards the method

Presentation of the method occurred after exploration of IoT and green services concepts and examples. Attitude towards the method was globally positive. Designers were told that even if –for most of them- they were not experts neither in IoT nor in air quality, they were experts of their own life and daily activities. Only a few participants were surprised and needed to be reassured not only about the liberty and degree of creativity they could express within the boundaries of ELLIOT green services topics but also about the main priority that was to identify a problem/need area and not always the solution.

Presentation of the GenIOT rules was guided by the participants, as they were discovering the tool kit. Most of the participants handled the silicon cubes while reading at the color code explaining that each fake sensor were referring to an air or noise measurement. As a consequence, most participants immediately associated GenIOT as a method for helping in visualizing polluted area (*"It is like having glasses that allow you to see the pollution"*). This interpretation of the method made it easy and fun for them to project themselves while placing the fake sensors (*"When I am in a meeting with my boss", "when go walking on the beach"*).

They also immediately foresee the social impact of public placement and were interested in raising awareness on air quality just by placing a silicon in a public place (*"imagine the walking men asking"hey, what are you doing with your cubes?"*). Some even talked about using the cubes to protest or complain about people responsible for pollution (*"We can put them on the four-wheels drives"*).

Potential practical hurdles for placing the probes were as well identified from the presentation of the method (*"what if I go for a run on the beach?", "what if I can't hang it?"*). Some even asked for technical questions (*"what is the sampling frequency of the sensor?"*), showing that they were already mentally projecting themselves while doing the exercise.

Participants also realised that the method requires a constant effort in introspection and analysis of the situation and some expressed concerns about their fear of not finding either the time (*"do we have to do it every day?"*) to play or enough ideas. Many spontaneously asked for the permission to share with their partners, family members the experience, which was allowed as a part of the awareness and co-creation process.

A significant number of the designers (4) did not participate to the face to face meeting but did transmit and explain their ideas so that they could be elaborated by the group. None of this excused participant addressed any critics or doubt about the method. All participants did bring back all fake sensors and all (but one, who found he covered all his activities) were willing to prolong the exercise.

During the review and scaffolding on the ideas posted, designers expressed a positive and constructive attitude both towards the group and the tasks they were asked to perform (group clustering).

Experience of the individual probe-based ideation

While the authors anticipated that designers would find it easy and instantaneous to go from the situation identification to the picture taking, most of the designers explained that they first thought about one or several ideas/situations then put it into scene and took the picture. As a consequence, the method was found demanding both on the time required and on the logistic side (*"difficult to get together the situation, the idea, the sensors and the camera"*). However the overall experience was positive since GenIOT was described as an experiential learning step: most designers said they increased their (and their relatives') level of awareness of the impact of air and noise pollution and realised the consequences of IoT deployment.

Identifying a situation

Several strategies were activated for identifying the relevant contexts. As expected, they *"start by thinking around [their] umbilicus"*, i.e. reinterpret their daily activities questioning their experience of the air or noise pollution. However, paradoxically, this introspection gave birth to many ideas that were finally not documented in the GenIOT process. Indeed, although designers mentioned not to have censored themselves, some explained that they prefer to bring to light ideas that could be generalised and extended to a broad population (no niche market), or ideas where IoT does bring a value. This issue had already been encountered in the dry-run of the method and the diary was presented in the ELLIOT workshop as a way to keep track of such ideas. But designers did not follow this instruction and an individual interview or follow up would probably help in solving this issue.

Participants said they appreciate to receive the (4) reminders sent by email in order to stay focused in the long run.

As they did not fill in the diary to keep track of the situations/ideas that they considered then discarded, it is difficult to get data on the volume and variety of the whole situations considered. In the next version of GenIoT, the open diary may be replaced by a closed one or even an individual interview.

Some designers expressed their uncertainty about the output they produced and felt uncomfortable as the facilitator choose not to comment any idea posted on the platform in order to leave it to the group members.

Next version of GenIoT will therefore give more weight to the individual feedback and community animation.

However the biggest issue does not related to the method itself but to the fact that the method was applied to the air quality and noise level. Most of the designers, who had no health or cardio-respiratory problems, found it difficult to identify new affordances related to air quality for day-to-day objects. Another run of GenIoT will be performed within ELLIOT targeting a group of people concerned about the impact of air and noise on the health and reported in another publication.

Placing the cubes

Very few problems where reported related to the placing of the probes (although placing the probes on plants such as trees, or in height, next to the light was challenging).

A few designers choose not to take picture but to report on the idea. Despite these participants did not follow the procedure, they report that the cubes did help them in their ideation. Such participants did not see the point in illustrating their idea by an image. Some therefore preferred to report the idea using words.

Taking the picture

Three types of problems related to picture taking of the probes were highlighted (a part from the availability of the camera). During the face to face meeting, participants reported they could not take picture for legal reasons (within a school or hospital for instance), therefore could not document their idea. Others mentioned the difficulty to take a picture while riding a bicycle or to take a wide angle picture.

Posting the idea

Issues encountered in sharing the ideas were actually related to the idea/picture posting process (facilitators got a couple of emails related to password lost and uncertainty about the max size of the pictures). Designers had to insert a login and password, then they were asked to choose an idea category, tag, and legend for posting the picture; documenting the idea was found a little heavy and most participants choose to group their posts in one shot.

Experience of the group process

Online group process

Despite the emails sent to the group every 3 days to call for publication of the picture as soon as they were taken –in order both for us to monitor the engagement in the game and for the designer group to get “food for thought”-, most of the posts, votes and comments, occurred from 3 to 1 day before the face to face session. As a consequence very few ideas could be discussed online and very few ideas were rated online.

However participants reported either staying neutral or be motivated by the fact that they were gaining points when posting ideas, comments or just watching the ideas. Furthermore, designers did connect to the platform to get inspiration.

Face-to-face group process

Conversely, face to face collaboration and co-creation occurred naturally when designers were asked in turn to describe one of their ideas to the group, elaborate it and place it on a chart. Scaffolding of services ideas happened in a respectful and constructive atmosphere. Ideas that were developed or redirected were different than the ones who had the most votes online or that had been commented.

Designers were then asked to cluster the ideas and two complementary leaders emerged but the group smoothly agreed on a common view of the ideas.

The assumption of the ideation methodology is that the GenIoT method provides a common background for the designers so that the AloHa! method could be played efficiently by a benign and caring group. This assumption matches what happened in the frame of the first ELLIOT green services co-creation workshops.

GenIOT production

Quantity of the ideas documented was not high (average of 2,90 ideas per designers). Designers were people who did not have cardio-respiratory problems and were volunteering for thinking on air quality and noise in relation with urban mobility. They tend to consider themselves as small pollution agents. In their awareness process they tend to disregard industrial and more generally external pollution and emphasis internal pollution. Indeed, although the idea of collecting data for highlighting polluted zone or lobbying was mentioned by one participant, designers preferred to focus on a pollution they feel they control: home pollution. Moreover, as expressed above, designers disregarded ideas they felt were too specific to their case that they considered not relevant for the wider population. As a consequence target of the IoT services are not niche markets but the wide public.

Functional complexity of the IoT systems described by the designers is low. The average number of sensors per service is 1,67 and the actuator is often a data visualization setting or a multimodal (visual, audio or haptic) alert. Even in the case of IoT service using 2 sensors, actuators are not regulated according to 2 values ($f(x,y)$) but follow two rules, one for each of the sensor data ($f(x)$ and $g(y)$).

The data gathered during the ELLIOT workshop does not allow establishing a link between the GenIOT method and the level of maturity of the ideas. Indeed some designers focused on the identification of the contexts in which an IoT service would be relevant and did not consider actuators, some even did not place the sensors in the picture but just mentioned it in the legend (case of the air pollution related to recycling centers for instance). Conversely, others, who found it important to specify the whole service would document it only if they could cover the whole process, as a consequence, a more elaborated service.

Variety of the idea was high, although one idea was developed under various declinations. Indeed, as showed in Figure 4, application of IoT for opening and/or closing the window depending either on pollen, noise or industrial pollution (incl. car pollution) was the most frequently documented idea. However the level of automation of the window was not consensual: half of the designers opted for a fully automated window while other claimed that they should stay in control and just be warned of when they should close it (by themselves).



Figure 4 GenIOT pictures expressing a similar ideas of an IoT service

While all proposed sensors were used at least once in the set of ideas, noise, pollen and industrial pollution are the most used sensors. Public space (streets, parks, public transportation), as well as domestic settings (home, cars) are the most frequent context of the services. Very few of the citizen-designers did mention their working premises; conversely the designers representing an institution or profession focused on their working premises. It seems therefore that the perceived role of the designer within the group did influence the designer in the performance of GenIOT.

Even if the GenIoT production was sometimes auto-censored by the designers and would have benefited from an extensive animation of the online platform and/or an individual interview, the services sketched by the designers were indeed embedded in their daily routines. The overall process was found demanding but instructional. Scaffolding and co-creation based on the GenIoT production did work well and enhanced the group cohesion and maturity, however the designers, influenced by GenIoT did stay at a low level of automation and complexity of the service. The AloHa! method was then applied in order to complement this approach.

The AloHa! method

While GenIoT used designers' creativity to foster the IoT and air pollution awareness process, AloHa! used such a designers' awareness to foster their creativity.

The aim of this method is to create services that do offer a value for the user or stakeholder vs. techno-push services that only serve as demonstrators and fail in meeting their audience. However AloHa! requires from designers another type of participation and activating other cognitive and behavioural skills.

Another bodystorming method ?

The AloHa! method is rooted in the service design domain where both improvisation (incl. brainstorming) and role playing have been used for fostering innovation and highlighting user needs since decades as highlighted by Medeler and Magerko (2010).

It builds upon the notion of "bodystorming" coined by Simasarian (2003), whereby participants not only project themselves (at a rational and controlled level as they could do while reading a usage scenario) in a given role but do enact as the character they play, therefore live a deeper experiential learning and go through another cognitive process as well as group processes.

However the AloHa! method extends this approach as it requires participants to enact not only as human characters but also as "intelligent" objects, giving them the opportunity to reconsider their affordances and explore new usages and functionalities that could be fulfilled if these objects could communicate. As depicted in Figure 5, the method relies on a toolkit with cards describing persona, objects, communication media and place. Characters of the role play have been defined as per Cooper's recommendation (1998) for building persona, on the basis on questionnaires and interviews on the themes related to the green services. This is why characters are also called personae. Objects belong either to generic categories such as furniture, house infrastructure, small appliance, clothes or jewellery or to a set of object potentially inspiring for green services (Baby buggy, walking stick, medical spray, car, bicycle helmet, key holder or green watch).



Figure 5 AloHa! toolkit and its relation with the scenario elements



Figure 6 AloHa! game process

One AloHa! match follows a 3 steps approach: casting, networking, acting that was introduced to the designers with the above Figure 6.

The method starts with a casting stage where designers choose their role either from a persona or an intelligent object card. Cards are printed recto/verso and can be worn as a necklace.

After some time to interiorize their character, designers are asked to network the ones with others “characters” or “intelligent objects” in order to unveil needs and bits of services they could provide. Several groups may arise, putting into light several pieces of service scenarios or concepts. Designers are asked to meet and work together until they feel they bring value to the service they are co-creating with the other players.

When groups are formed and service scenario is starting to arise, participants are asked to refine the scenario by using a systematic approach and specifying not only what information but also how they communicate to each other’s (they may use the “how”/media cards as a visual support) and describe better the context and time of the scenario (supported by “when”/“what” cards).

At this stage, upon facilitator or participant request, designers may switch persona/object in order to provide their input as another persona or as subject expert matter.

Ultimately, when the scenario is described, the group of designers enacts the scenario on the “theater scene” in order to explicit all knowledge and conditions required for the service to be viable and adopted.

Expected benefits of AloHa!

Benefits of the method come from the serendipity in which objects may communicate, and from the projection of the actors into personae. Persona cards are thought in order to maximize the viewpoints on a given area (for instance on air pollution and IoT for the green services) and cover a composed but relevant sample of the potential human actors. Generic “Intelligent” objects from the object cards have as well been chosen to cover the domains which have already given birth to several augmented objects (as summarized in Kuniavsky (2010)).

Furthermore, the AloHa! method does not only support innovation via the creation of objects/actors dialogues but also via the systematic description of these communications supported by the media/“how” cards and the scenario bodystorming.

Challenges of AloHa!

Such a method puts a heavy burden on the participants/designers profiles as they are required not only to demonstrate an experience and networking mindset as for any living lab experiment but also they should be flexible enough to enact in relation with people they may not know and demonstrate the cognitive plasticity of thinking and feeling like an object embedded in an IoT world.

The ultimate objective is to facilitate the co-creation of a service concept where the knowledge, social and business dimensions, as defined by Bifulco and Santoro (2005), are considered. However, AloHa! ideation builds on the instant

inspiration and may need to be fine tuned or even deconstructed in order to accommodate for different viewpoints. As a consequence, it is difficult to anticipate the type and robustness of the IoT service concepts generated via AloHa!

One of the assumptions for placing GenIoT before AloHa! is that designers would first learn about the possibilities offered by the Internet of Things perspective, then get acquainted with their co-creators, therefore speeding up the AloHa! process. Indeed, one other major challenge of the AloHa! method is to find a good balance between time spent for running the exercise and efficiency in terms both of designer experience and service innovativeness.

Feedback on the AloHa! method

We report hereafter the first results from four games run with four different groups, with an emphasis of the observations performed during the games played within the ELLIOT project and after having run the GenIoT (with the 11 "designers" mentioned above). Feedback on the AloHa! method is presented following the phases of the game: attitude towards the method, experience of the method, experience of the group process, quality of the production.

Attitude towards the method

After an initial surprise effect, participants be they amused, doubtful or excited, tend to choose cards representing persona. Indeed, the objects cards were often chosen as a second or only choice. Choice of the object or persona card may depend on the knowledge and proactive attitude towards IoT, further data are needed to conclude. Designers were asked to stand up for networking; observation of their body language showed that most participants were cooperative, willing to experiment the method.

Throughout the networking period of the game designers demonstrated a constructive spirit, walking and smiling to the others, and when asked to play on stage, none of them refused or showed embarrassment, even when they were acting as an object (cf Figure 7 including a participant acting as a helmet or a buggy). During the first sessions, some participants mentioned the need to write down ideas for not forgetting them in the hurry of finding a partner for scenario. Indeed, a few participants expressed that they were so used to think with a pen and paper that they could not focus and be effective during AloHa!. Possibility to use post it for note taking was therefore added in the ELLIOT green services session; those were seldom used but did allow participants to stay in the co-creation loop and "park" ideas on the post it when needed.



Figure 7 Designers enacting IoT green service scenarios

Experience of the method

A first standalone run of the method during Lift France 2011 conference underlined the importance of the physical arrangement of the room (acceptable air quality/temperature, noise level, freedom for moving within the room) and the physical placement of the cards (both for choosing them and while networking). The dry-run showed that the level of description of the personas needs not to be too detailed in order to leave the room for creativity and empowerment of the role.

Both the speed networking and the scene performance were lived as creativity lift. Indeed, as reported by a designer, the time pressure during the networking made them *"tend to think aloud, letting out both good and bad ideas"* and they realised that they could speak freely as in some cases and collectively scaffold realistic scenario, *"bad ideas were adapted by the others so that we could play them"*. Being in the action, having to play live on the fictional stage was as well a creative experience. Indeed, many designers tried and adapt the collective scenario in order to make it more detailed and plausible, sometimes going further than what they would have imagined in a traditional discussion : *"as we are here [on stage], we have to invent, otherwise there is a silence in the air. We are not blocked [...]. We can imagine the craziest scenarios and we are not even scared"*.

However, a difference has to be highlighted between the Aloha! workshops performed in a standalone mode and the one coupled with GenIOT. Indeed when performed in standalone, many designers complained that, while they felt comfortable with the method, they had difficulties applying it to the green services topics *« Sometimes, I felt a little bit frustrated to have to deal with air quality"*. In the coupled Aloha! sessions, this concern was only raised once. The order in which the coupling should be done may therefore help designers focusing on the project theme in a more natural way.

Experience of the group process

Informal and fun atmosphere was reported as the top positive feature of the sessions (together with efficiency). While seriously brain and body storming, designers spent much time laughing and appreciated the playful ambience (cf Figure 8).

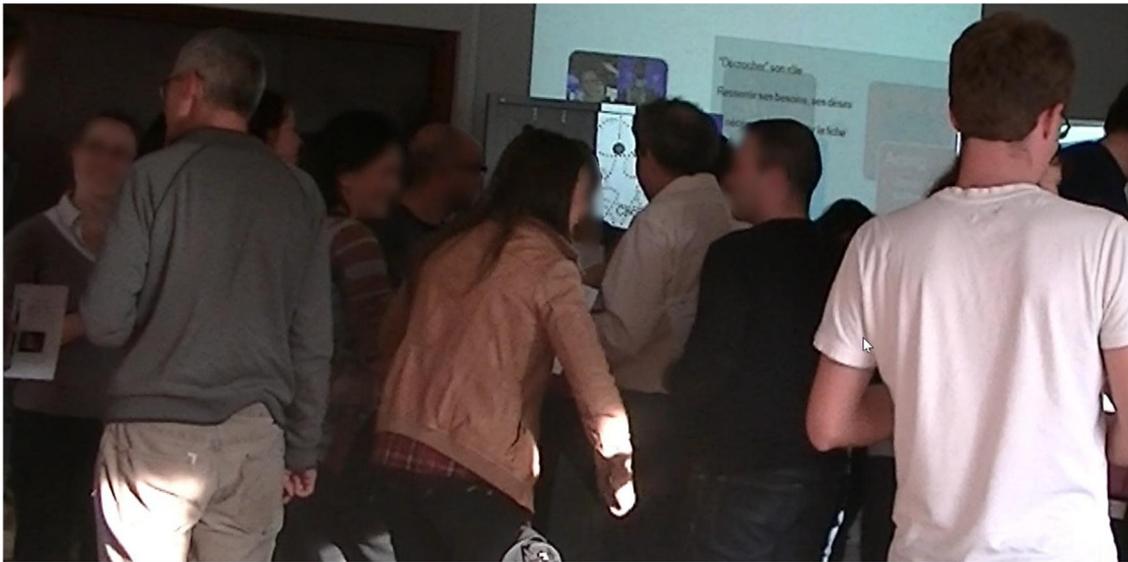


Figure 8 AloHa! networking phase (incl. a designer acting as a walking stick)

Despite strong and competent personalities present in the group, we did not observe influential behaviour nor authoritarian leadership during the networking and scenario building: as designers were standing up and free to walk away, they tend to approach and stay close to the people they could build and co-create with. Regulation of the group therefore happen without any external intervention.

During the networking period, designers tended to present themselves to others without adapting their presentation to their interlocutor. Moreover, they very rarely acted as an intermediary, linking together two other participants (with an exception for the "medical spray" object and the "asthmatic girl"). This behaviour may be due to the time pressure.

Moreover, designers playing the persona role had the propensity to connect with objects and not other human beings, while designers playing the intelligent object role would meet both humans and objects. This may support the hypothesis against

which scenario were built around objects functionalities and affordance vs. human goal or activities. Such an hypothesis of a functional driven (vs. context and goal driven) design is as well reinforced by the fact that when asked about the scenography of their play, most of them did not think carefully about it and were just able to ask for a "street" or "office" picture to be projected behind them (cf. upper picture in Figure 7).

A crystallization phase could easily be identified for each play: when a group of designers felt they had enough material to build a scenario, they were inclined to stay in the group and started to talk louder and joke. It is like they were relieved to have made it, to have found partners for building a meaningful service.

As this stage the facilitator asked for details and reminded of the additional cards for a systematic description of the service. Usage of the cards may have been perceived as too restrictive or not relevant. During the ELLIOT workshops, communication and place cards were hardly used: most designers spontaneously detailed the scenario because they were rehearsing for the stage performance and not as systematically as they were instructed to do.

An hypothesis was that a trustful, open and very connected group will lead to a more quantitative and varied output in terms of service concept. Data obtained from the running of AloHa! with four groups can neither support nor contradict this hypothesis. However the size of the group seems to be determinant of the group process and production. Within large groups (≥ 25 participants) the noise and heat generated by the networking effort does not guarantee an optimum experience. Moreover the high number of potential combination tends to extend the networking time and resources to the expenses of the service details and rehearsal. Large groups can therefore be used for generating a wide spectrum of ideas and explore for instance an activity (such resting, eating etc..) or a geographical area (such home related services, working related services, skying related services).

On the other hand, when the group is small (≤ 6 participants), designers attempt to build a scenario encompassing all participants, therefore skipping the networking phase until they realise that building a scenario from the beginning with the whole group is much harder than starting with dyad, triad and extend the group.

As it is a rather intensive exercise, we do not recommend playing it a second time in a row.

AloHa! production

One AloHa! run typically takes 1 hour and leads to an average of 1 scenario per 4 participants. Acting of the scenario lasts in average 4min. The number and type of sensor in AloHa! sessions was very similar to the ones of GenIOT, however the service concepts were developed with more details, as bodystorming of the scenario requires to further explicit the idea than a picture posted in GenIOT.

Most of the intelligent objects created during the four sessions fall under the "augmented object" category. The "joker card" allowing to add an intelligent object to the list, was used but not for creating a new object (as the Carrotz rabbit for instance). Such augmented object offer new functionality and/or new affordances (e.g. helmet with head up display to indicate preferred itinerary or the baby buggy that changes color depending on the air pollution).

Whereas GenIOT production depicted the sensed data and the display of the information sensed, AloHa! scenarios describe more elaborated communication paths, and involve more persona. Scenarios are as well situated in a longer time horizon and gives the objects more decision power. Designers did observe spontaneously that "*objects become more autonomous [in AloHa!] ", " decision becomes transparent to us, and [objects] may actually help, as we don't need to know whether there is pollution as a preventive action has been taken"*. However, the scenario generated in AloHa! were very often challenged when AloHa! is finished and designers take the time to rationalize their behavior and start to envision more aspects. For instance designers noticed that "*Humanisation of the object tend as well to increase the machine to machine communication [M2M]"* and some of them expressed their fear of a decrease of human-human communication to the profit of M2M. Beyond this classical attitude towards technology, the lesson from such discussion is that AloHa! does meet its objective as an experiential learning of the concept of IoT.

AloHa! is effective in co-creating user centered IoT service concepts as well. However, the balance between the various aspects of the services design was only partially addressed. The main focus was indeed the temporal sequence of the actions, the touch points with the various actors; the economic and technical viability of the service was only a peripheral issue. Further sessions including more entrepreneurs and economical actors need to be run in order to understand whether this pitfall stems from the method or the designer profile. In the meantime, a classical brainstorming for developing, merging and prioritising both AloHa! and GenIOT service ideas is required to go further from ideation to concept development.

Conclusion

This paper tackles the participative ideation methodology followed by citizen and stakeholders for designing IoT based services concepts, i.e. the very early stage of the design cycle. GenIoT, the first method presented here, complements the AloHa! method not only because it is situated, i.e; provides in situ data, but also because it adds the third experience design research dimension to the "say " and "do" dimensions already covered by the AloHa! method, namely, the "make" dimension.

Moreover, the methods address various cognitive style and personalities traits: while GenIoT requires a continuous exploration of self-behaviour and lifestyle, requires some logistical preparation and asks to share potentially intimate settings, activities or even fears, Aloha! is an intensive one shot improvisation exercise calling for interpersonal skills.

Both methods presented above -GenIoT and Aloha!- address individual and collective creativity as well as individual and collective awareness on IoT and, in the case of the ELLIOT green services use case, awareness on air quality and noise pollution. Evaluation of the single method is therefore complex on the methodological viewpoint and does require further research. Both methods being already demanding from the designers viewpoints, finding an appropriate balance between running the methods (maintaining the fun, experiential and creative aspects) and evaluating them was found challenging (for instance some cognitive style evaluation questionnaires had to be removed from the initial protocol in order to keep the participants fully involved in the discussion) .

Initial feedback gathered on the single methods allowed however to compare the two methods since they were applied to the same theme and, for one designer group, to the same participants. The methods appear complementary not only for what regards the cognitive skills involved and the level of IoT awareness but also their outcome in term of service ideas: GenIoT service concepts were really grounded in daily practices, with mainly a short term implementation, requiring low level of automation and involving one user. AloHa! allows to extend this vision with more futuristic concepts, a more elaborated service where autonomous objects and stakeholders interact.

However both methods are demanding for the designers in terms of cognitive, logistic and temporal load.

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Searching for Definitions for Service Design – What do we mean with Service Design?

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Abstract

This paper explores the origins and meaning of service design. The purpose is to explore the concept of service design as used in services marketing & management and design discipline. The paper tries to bring forth some of the most used definitions for service design. The paper is explanatory by nature. The aim of the paper is to create more discussion on what do we really mean with service design.

A limited literature search was conducted to find out different definitions given for service design. The search was conducted by using two different scientific databases. Term "service design" was used in the search limiting the results to abstracts. These searches produced some 375 hits. Part of the articles were read and analyzed in search for definitions for service design. Articles that contained some definition for service design were chosen for a closer study.

There were several findings in the study. First it became evident that very different meanings are being placed on service design. Secondly very few clear definitions were found, some definitions were very wide some very focused. Thirdly many scholars didn't define service design even it played an integral part in their paper.

KEYWORDS: service design, service development, literature review, definitions for service design

Introduction

Service design has become a very hot topic in services marketing & management (later SMM), operation management (OR) and design research. Service design is currently emerging as one of the major themes of the modern business and design education. The origins for service design can be found in services marketing literature (Shostack 1982; Shostack 1984; Scheuing & Johnson 1989; Gummesson 1990). Due to rapid growth and heavy competition in service business in western world service design has gained more weight in research arena. While the term service design was brought forth by services marketing researchers it gained much more momentum when design discipline started to show interest in it. Although all players are heading into same direction and mostly seem to use very similar approach to service design some great differences seem to exist. The discussion seems to merging from single disciplines into multidisciplinary *Service Science* (See e.g. Maglio & al. 2010). This in turn is creating temporary flux of definitions, approaches and languages until more comprehensive vocabulary for services and service design is established.

Many service design researchers seem to agree that service design is a multidisciplinary topic even some people working as service designers still seem to think it is dominantly design discipline, maybe because the word design is used in service development and innovation context. Even service design and customer centred service development has been a major part of SMM research many decades it gained more weight in research at the time when services marketing was considered to be an established discipline in 1990's (Brown, Fisk & Bitner 1994).

Lynn Shostack who invented Service Blueprinting (1982, 1984) is focus service design in service delivery process and its visualization. Eberhard Scheuing and Eugene Johnson (1989) see that service design starts with the new service development process. They link service design to service concept, design of operational details and to the design of service delivery process and system (Scheuing & Johnson 1989). Evert Gummesson (1990) calls for service design competence, he links it closely with Service Blueprinting and service quality improvement, but does not define clearly what he means with service design.

William Hollins (1993) was probably the first design scholar to study service design. He starts with TQM thinking and builds an elementary model for service design process while failing to give any clear definition for service design. Unfortunately for the present research these pioneers created no exact definitions for service design in their early articles.

There seems to be some communication gap between SMM and design discipline in the area of service design. The gap is slowly getting smaller. More lively discussion on service design between the scholars in both disciplines has emerged in recent years (e.g. ServDes conference). When studying closer the scholarly work in service design one can see some kind of common understanding slowly emerging. Some scholars have made efforts to bridge this gap and find common ground for discussion in service design (See e.g.: Kimbell 2011).

Lucy Kimbell (2011) analyses the problem of different disciplines talking about service design with different approach and partly different terminology. She concludes that different players in service design or service development research see service design from a different angle. She argues that there are at least four different approaches to service design and that two of these four have a major difference in their approaches to service design. One is service *engineering* approach that is based on problems solving with predetermined design of the service and outcome focus. The other is *designing for services* approach in which design is seen as exploratory enquiry. In this approach it is seen impossible to predetermine the design totally in advance or make the design ever totally complete. (Kimbell 2011)

Method

A limited literature search was conducted in order to find out common definitions for service design and to find out what kind of differences in service design definitions exist. Search terms "*definitions for service design*" and "*service design definitions*" created only four hits in Metalib search system. It searched this term in thousands of different journals. Then a search for term "*service design*" was executed by using two scientific databases Emerald and Proquest/Abi Inform. The search was limited to abstracts and peer reviewed scientific journals with the extra limitation for subscribed content and full papers. The extra limitations are dependent on the subscriber rights and caused further limitation to the search. This search produced 53 hits in Emerald and 322 hits in Proquest Abi Inform.

The amount of hits created a major challenge for this study. It proved to be difficult to find some objective way to search for the definitions for service design. During three long interviews with different informaticians in two universities it became evident that one has to limit the hits and the analysis other some way than by using the search functions in different databases. All the articles found through Emerald search were read and analysed and some of the definitions chosen for a closer study. Proquest/Abi Inform search was limited to only few journals. It is self evident that this explorative and methodologically weak approach left many relevant sources out of this study.

Results & analysis

Multiple different definitions and very different dimensions were given for service design in the studied articles. Many modifications of service design were found:

- new service design
- multilevel service design
- service system design
- service process design
- design of services
- service concept design
- services redesign
- service recovery design
- service design planning
- service encounter design

These modifications and the loose manner they were used painted a picture of a wild west of service design terminology. All authors who used these modifications used also the term service design. Either the term service design appeared in a more specific context (e.g. service process design) or in a complex and loose context (e.g. multilevel service design).

The definitions for service design were gathered in a table (Figure 1). The table consists of four different categories: definition(s), authors, publication date and dimensions. The dimensions category was established because all definitions are multilevel in their approach to service design (like *"service concept in service delivery system"*). This loose category aims simply to show more clearly the major differences in different definitions. The definitions are not put into any relevance ranking. The order of the table is based on publication date.

| Definition | Author | Year | Dimensions |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| No clear definition <i>"In service design, we seem to have followed the blueprinting movement but we appear to have ignored the process of design in favor of this descriptive activity and the relationship between important, and often ignored, back-office activities in favor of customer-facing processes."</i> | Johnston R. | 1999 | Service Blueprinting is seen as the root of service design description but lacking a real design approach |
| <i>"...Designing service means defining an appropriate mix of physical and non-physical components."</i> | Goldstein S., Johnston R., Duffy JA. & Rao J. | 2002 | Service concept as a key driver in service design decisions NSD, SD and SI handled as somewhat similar terms Service design planning model linking service strategy to service design |
| <i>"Service design here refers to the design of facilities, servers, equipment, and other resources needed to produce services. It includes blueprint of service system, specifications, procedures and policies."</i> | Ghosh S., Surjadaja H. & Antony J. | 2004 | Service design focuses on back-end support of service operations Designing facilities, equipment and resources Creates trilogy of services marketing, service design and service delivery |
| <i>"NSD encompasses the development of tangible and intangible elements of a service, not previously offered by the supplier, including "offer development", i.e. the development of "processes by which the product (or service) is evaluated, purchased and consumed" .."A wide range of organizational features may be including systems, staff, the physical environment, and organization structure and control."</i> | Smith A, Fishbacher M. | 2005 | NSD with an emphasis of: - Development process - Organizational structure and control - Stakeholder relationships - Interaction with final customer/consumer |
| <i>"..The service design framework defines two dimensions – continuity of co-production and mutual adaptability – characterized by the process of exchanging service/benefit and building relationship involved within a service."</i> | Tung W-F. & Yuan S-T. | 2008 | Design science approach Ecologic symbiosis concept Intelligent design framework of service systems Systematic service innovation |
| <i>"..Planning of the service concept, service process, and service system in a manner that enables the value-in-use of the intended service to be realized"</i> | Åkesson M. & Edwardsso n B. | 2008 | Service concept in service delivery system Categories of change: - Service encounter and service process - Customers as co-creators - Efficiency - Increased complexity - Integration |
| <i>"Service design aims at designing services that are useful, usable and desirable from the user perspective, and efficient, effective and different from the provider perspective. It is a strategic approach that helps providers to develop a clear strategic positioning for their service offerings. Services are systems that involve many different influential factors, so service design takes a holistic approach in order to get an understanding of the system and the different actors within the system."</i> | Mager B., Sung T-J. | 2011 | - Customer journeys - Visualization - Services as systems - Strategic approach |
| <i>"Design for experiences that happen over time"</i> | Clatworthy | 2011 | - Touchpoints as central part of service |

| | | | |
|--------------------------------------------|----|--|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>and across different touch- points"</i> | S. | | design - Touchpoints as a reference to service encounter - Touchpoints as part of service innovation - Modelling services through touchpoints |
|--------------------------------------------|----|--|--------------------------------------------------------------------------------------------------------------------------------------------------------|

Figure 1. Definitions for service design

Some definitions were specific but none of them was rigorous. Some definitions consist of so many different aspects and professional areas that they seem to say service design is everything (like Smith & Fishbacher 2005, Mager & Sung 2011). Some of the definitions were short and limited to few aspects (like Goldstein & al 2002, Clatworthy 2011). The all-encompassing definitions seem to take more systematic, complex and holistic view of the whole service production (producer, customer, end-user, networks) while the more compact ones place more emphasis on human experience and focus on single aspects like touchpoints.

Ghosh & al (2004) mention facilities, resources, policies and procedures in their definition as integral parts of service design. This definition gives easy access to the terminological cacophony one encounters when exploring the meaning of service design. It raises more questions than it answers. What do they mean with policies and procedures? How do they limit the term resources? Many of the definitions were hard to understand because they were build of different terms (concepts) like service concept, service system and service offering. Each of these terms have many different definitions.

Clatworthy (2011) sticks to his guns and creates service design understanding through the concept of touchpoints – he is focused in development and creation of service encounters. He leaves less room for speculation than any other of these definitions. Also Goldstein & al. (2002) give short definition but obscure it by talking about non-physical components. Goldstein & al. (2002) and Åkesson & Edvardsson (2008) link service design to service concept.

It is interesting to find out that the definition Mager & Sung (2011) create has similarities with the one Åkesson & Edvardsson (2008) and Smith & Fishbacher (2005) create. Åkesson & Edvardsson (2008) give short but almost all-encompassing definition for service design. They see it as integral part of service concept that in turn is part of service system, the service concept includes both customer and providers perspective and tells at least part of the business strategy (Åkesson & Edvardsson 2008).

Just by looking at the definition by Mager & Sung (2011) one might think they define service design more or less from a services marketing perspective. The fact that Birgit Mager is widely considered to be the leading expert of service design in design discipline makes this loose similarity interesting. At closer look to their article one sees that they mix service development, services marketing and management and systems thinking, visualization and call this mixture service design.

Conclusions

It seems to be very difficult to sort these differences in approach and definition with any accurate and all-encompassing model. The study reveal that there is a urgent need to find a more understandable and commonly accepted approach to service design in order to find more scientific basis for service design research. A lot of brilliant effort is partly wasted when all parties talk to one another with a different language.

There are several limitations to this study. The greatest weakness of this paper is methodological. Firstly the search criteria can be criticized for limiting search for only two scientific databases, and then hand picking some from the other rather than reading more relevant amount of articles. Although limiting hits to abstracts is more easily defended. Rather than limit oneself in literature review to predefined search criteria and to mercy of different search parameters in different scientific database and one could have taken a through historical review on the development of the term. This approach might have given more clear picture and and more muscle to the analysis of the term. Secondly no established method for analysing the definitions were used. Thirdly the definitions could have been organized into more comprehensive model like the one Lucy Kimbell (2011) used in her approach.

All in all despite these shortcoming one can claim that at least to some degree the paper reaches its goal. There is a short exploration to the term and to different definitions given by various authors of different disciplines. The exploration tells clearly that at least there seems to be some similarities in service design definitions there are also many differences. It also shows that some definitions are build so wide and multilevel that they rather disrupt the term than clarify it.

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Service co-design using online ideation and face-to-face testing: Case City Adventure

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Abstract

Service co-design with users offers great potential for companies. However, it can be difficult to reach potential users and only a small group can be involved in face-to-face co-design sessions. Online tools offer new possibilities for co-designing services with larger user groups regardless of time and place. This paper presents a case study, in which 36 users participated in the online co-design of a city adventure service and six of them also tested a service prototype in the real world. We studied how online ideation and face-to-face testing can be combined, and how the different methods support each other. Online ideation proved to be an effective method for collecting users' general expectations and provided inspiration for development, whereas face-to-face service testing resulted with more concrete development suggestions. The results suggested that the combination of online co-design and real world testing leads to rich and extensive user input.

KEYWORDS: co-design, consumer services, online ideation, service testing

Introduction

User-driven innovation has gained a lot of interest in companies that compete in developing new products and services that meet users' needs. Yet, the innovation literature mainly concentrates on creating tangible products and also user innovators were first identified in the context of new product development (e.g., von Hippel, 2005). Because services cannot exist without interaction with users (Prahalad and Ramaswamy, 2004; Grönroos, 2011), user participation in the service innovation process may be even more useful than in tangible products (Alam and Perry, 2002). In the recent years, service design has become an important area of applying user-centered and participatory design methods that have been previously used for example in information system design (Holmlid, 2009).

In the field of service design, a variety of methods have been developed to involve users in the design process in its different stages (Service Design Tools, 2012). However, most of the

methods are based on face-to-face communication and workshops, which mean they are costly and difficult to organize in practice (Sanders et al., 2010). Even if the service provider would have enough resources, it can be challenging to reach and involve all stakeholders in the innovation process. Especially consumer involvement in the new service development can be difficult, if there is no existing user base that could be invited to participate.

We suggest online tools as an opportunity for reaching a large amount of geographically dispersed users easily, quickly and cost-efficiently. Virtual environments support more interactive, flexible and frequent collaboration with users than traditional marketing research techniques, like surveys, (Sawhney et al., 2005) which make them attractive for new service development. However, there is little research about applying online tools in the service design context. Real-time video conferencing has been used as an alternative for physical co-design sessions (Sanders et al., 2010), but there is little experience about using asynchronous, web-based tools in co-design with users.

In this paper, we present a case study, “City Adventure”, in which an urban adventure service was developed together with potential users. The aim of our study was to evaluate the applicability of online tools in service co-design with consumers and compare the online ideation method to face-to-face service testing. We evaluated the methods from the viewpoints of the usefulness of user input and the facilitation of the user participation.

User involvement in service design

In the service management literature, the term “co-creation” refers to the interactive process of value co-creation (Prahalad and Ramaswamy, 2004; Vargo and Lusch, 2008). The customers create value when using a service and the service provider’s role is to be a facilitator of that value creation (Grönroos, 2011). Co-creation also refers to consumer empowerment in the service development process (Hoyer et al. 2010). Users are able and willing to suggest ideas and participate in design activities instead of being mere informants or evaluators (ibid). The terms user-based innovation (Sundbo and Toivonen, 2011) and user-driven innovation (Kaasinen et al., 2010) have also been used to describe the same phenomenon.

In the field of design research, the term co-design has been used to describe the collective act of creativity across the whole span of a design process: from exploration in the fuzzy front end to ideation, concept development and prototyping (Sanders and Stappers 2008). In co-design, users do not only answer surveys like in market research or evaluate prototypes which is typical in user-centered design (ISO 9241-210, 2010), but they actively participate in the ideation and design activities.

Users can participate already in the exploration phase, in which generative design research methods, like cultural probes (Gaver et al., 1999) and design games (Brandt, 2006; Ylirisku and Buur, 2007) can be used. Idea generation includes activities like stating needs and problems, finding solutions, criticizing existing service and providing wish lists and adoption criteria for new services (Alam and Perry, 2002). In the concept development phase, users can either give feedback in response to given ideas and design suggestions, or participate in organized design sessions in collaboration with designers (Følstad, 2009). Since services are intangible, users also need concrete representations of the service concept in order to envision the service experience and give feedback on it. Service prototypes can have different forms and levels of fidelity and functionality, such as scenarios, visualisations, videos or simulations of the service (Blomkvist, 2011). They can be used in different stages of the design process as a tool for

communication and testing in the place, situation and condition where the service will actually exist (Service Design Tools, 2012). Prototypes can be tested from the usability point of view by systematically observing and interviewing users about the use of a product or service or from the experience point of view already in early phases of the design process (Buchenau and Suri, 2000).

The case set-up

In order to evaluate the use of online tools in service co-design, we conducted a case study in collaboration with a Finnish service company that offers city adventures for companies' recreational events. The starting point for the study was a prototype of an agent adventure in which adventurers solve problems in groups in the city. The company had arranged the adventure once before and noticed that it does not work as such. Therefore, they wanted to develop the service further and were also open to any new adventure concepts. In order to develop services that would meet customers' expectations, potential customers were invited to participate in the service design process.

Users participated in two different stages, at first in online ideation and testing a prototype of the service in real world situation. The aim of the both methods was to generate new ideas for adventure services. Online ideation was divided into individual part that aimed at inspiring and stimulating ideas around the adventure topic, and to a collective ideation part with other users in the form of online discussion facilitated by a researcher. Table 1 shows the aims of the different phases and the tasks given to the users.

Table 1. Co-design methods in the case study, their aims and user tasks.

| | Inspiration (online survey) | Ideation (online discussion) | Prototyping (face-to-face testing) |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Aims | Orientation to the topic, inspiration from the past experiences | Ideas for an agent adventure | Feedback and development ideas for improving the service |
| User tasks | Describe what 'adventures' mean for you? Tell about the adventures that you have experienced (childhood, abroad, home town)? Why were they adventures? | Generate ideas based on 1. adventure memories 2. agent videos 3. "magic wand" metaphor: "What would happen in an agent adventure, if everything were possible?" | Experience the agent adventure Give feedback during the experience Discuss with the group, how to develop the service experience |

Since the participants of the case study were not former customers of the company, and they had no experience with the existing city adventure services, other stimulation for new ideas was needed. The existing adventure prototype served as one kind of inspirational material, but we did not want to restrict the ideation based on that specific concept. Because user experience is influenced by previous experiences and expectations (Kankainen, 2002), and all people have some kind of experiences with adventures, we decided to take the past experiences as a basis for generating ideas for the new service. We applied the event-based narrative inquiry technique (EBNIT), which is a cost-effective way to get concrete, new and usable ideas, by telling stories that are based on past or imaginary events (Helkkula and Pihlström, 2010). Users were asked to write stories about previous events related to adventures, and the “magic wand” metaphor was applied to stimulate new ideas for adventure services.

Online ideation

Users’ ideation was supported in an online innovation space called Owela. Owela is a social media-based co-design platform that has been developed for involving consumers in innovation activities (Näkki and Antikainen, 2008). The Owela platform consists of an open innovation forum and project spaces that are used in scheduled co-design projects. The co-design projects typically include discussion, idea generation, concept evaluation and testing and utilize methods, such as, online questionnaires, blogs, discussion, voting, and chat. Owela has been mainly used for co-designing online and mobile services and the user community consists of over 3000 Internet users who have been involved in one or more co-design projects.

The participants for the City Adventure case study were recruited via email invitation that was sent for approximately thousand registered Owela users, who had announced that they were willing to participate in different innovation projects. 36 people joined the “City Adventure” project. At first they answered the inspirational survey alone, and then continued to the discussion part, where they ideated agent services with other users. The online discussion period lasted two weeks. As a reward, five double movie ticket packages were drawn out of the hat among users who had achieved at least 20 activity points by answering the survey, writing ideas and commenting on others’ memories and ideas.

In the survey, it was explained that the stories and ideas that people individually wrote, would be later shown to the other participants in the “City Adventure” project. Based on previous experience in Owela, we believed that users would be more productive, if they first ideated alone, but then were able to see all the other ideas, and continue ideation based on them.

The survey started with questions about participants’ previous adventures in their childhood, when travelling abroad, and in a familiar city. After that, the respondents saw a video that showed some aspects of the existing agent adventure concept. It was supposed to trigger ideas for new and improved features in the service concept, as well as the new services. After completing the survey, users were shown the memories and ideas of other respondents, and they were asked to comment on them in the discussion workspace. Users could comment and rate other users’ ideas, as well as continue developing new ideas. Figure 1 shows an example of an idea discussion based on a video that related to the agent adventure. The video did not reveal anything about the service itself, but presented some agents and tasks that were part of the adventure. The function was to stimulate ideas.

Service testing

After the online discussion, all users were offered an opportunity to participate in testing the early prototype of the agent adventure service that was supposed to stimulate new adventure ideas. Six people participated in the service testing session, in which they experienced the service in groups of three people and one researcher. The basic idea of the service was to help an agent to catch his enemy with the help of the hints that the agent gave via YouTube videos and messages around the city. Some tasks required taking contact with various people that were played by the company employees. The adventurers were equipped with netbooks with an internet connection in order to contact the agent. Figure 2 shows two examples from the test group doing its tasks.

During the 1,5 hour adventure, one researcher made notes about user experiences and feedback during the trip, and the other shot a video that was used later to show the service concept to other people. After testing the service, six users, researchers and three representatives of the service provider gathered together to share their experiences and development ideas.



Figure 1. Collaborative idea development based on a video in Owela.



Figure 2. Potential users testing the agent adventure.

Evaluation

The appropriateness and quality of users' ideas and feedback was evaluated based on how well they served further development of the service. The researchers created a summary of all user ideas and feedback, and presented them in a workshop that was held with the service provider. Three employees of the service provider and four researchers joined the workshop. A method called Design Jam (May, 2011) was applied with its five stages: empathize, define, ideate, prototype and test. Users' stories and new concept ideas from Owela and test feedback to the service prototype served as inspirational material for service development even if the users were not present.

Results

36 people answered the survey and wrote altogether 86 stories of previous adventures in three categories. The stories were later commented on in the discussion forum, altogether 143 times by 18 people. Half of the participants only answered the survey, but did not comment on others' stories, or even visit the discussion forum for a second time. A couple of examples of the adventure memories are presented in Table 2.

Table 2. Examples of adventure memories.

| | Memory | User |
|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| 1 | “My car broke when I was on my way to Russia, and I ended up crossing the border by thumbing a ride from a Russian trucker. It was an adventure, because we had no language in common and no congruent documents that were needed for crossing the border.” | male, 42 |
| 2 | “I went with my best friend to explore a closed brick factory. It was forbidden, and therefore really exciting.” | female, 58 |

In addition there were 34 new ideas and 103 comments on ideas. The most ideas were written during responding the original survey, where users saw a video that is part of the agent adventure. There were slightly less ideas than participants in that phase (36). However, many ideas were added also as comments to the original ideas. The discussion topic with the "magic wand" metaphor was posted a little bit later and did not result in many new ideas. Some examples of the ideas generated by users are presented in Table 3.

Table 3. Examples of users' ideas for the agent adventure.

| | Idea | User |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| 1 | “Start: a group of 4-8 people with no communication devices is brought to a place that they don't know. Task: to arrive in a certain place in three days with the whole group. Extras: there could be an actor in the group, or special tasks like canoeing, climbing or hunting their own food.” | male, around 40 |
| 2 | “An adventure for seniors with a good sense of humour and weak language skills would be an orientation competition in Suomenlinna fortress in a dark evening. They would get hints of the places only in English.” | female, 73 |
| 3 | “I would like to have some challenge instead of sightseeing! The two agents could be something totally different than what they look like. I should solve the mystery during the adventure.” | female, 32 |

Six users volunteered in the face-to-face service testing that resulted with concrete development ideas for the agent adventure. During the test, the participants empathized themselves with the agent roles and really played the story as real customers. They were also active in giving feedback and made sure that the researcher, who followed them, wrote down all breakdowns in the service concept. The users commented experiential and practical things, such as coldness, technical problems, their own attitude, the story, and company employees that acted as agents along the way. Some users' comments are presented in Table 4 with the development needs.

Table 4. Examples of comments during the service testing.

| | Comment | Development need |
|---|---------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| 1 | “How do I connect this netbook to Internet?” | Simple technology that does not need attention from the actual adventure. |
| 2 | “I knew that the other group would be here before us. Let’s see, what they do.” | Better timing of the group tasks so that the “magic” of the adventure doesn’t break when they meet other groups. |
| 3 | “Hey, look at the discussion history in Skype. Someone has been testing this!” | Test logs must be deleted before giving the devices to the customers. |
| 4 | “What should we do when we find the enemy?” | More clear description of the task. |
| 5 | “I cannot hear this hint, as the cars are so loud.” | The video hints must work also without sound. |

During the group discussion after testing, the users rated the service experience on a scale of school grades (from 4 to 10) and justified their decision. All rates were between 8 and 9 and the overall comments were positive. All users liked the story, and the improvement ideas concerned mostly the vague end of the adventure, some technical problems and a couple of tasks that did not work well in the city context. The users also started to ideate alternative ways to organize the adventure.

Discussion

The case study verified that online tools could be used in service co-design with consumers. Users participated in the discussion actively and some of them continued commenting also after the actual study period. Users were able to imagine new service ideas based on previous experiences and the videos that presented some ideas of the service prototype. The online and face-to-face methods are here evaluated based on the differences in user participation, quality of user input and facilitation of the co-design activities. A summary of the findings is presented in Table 6.

Differences in user participation

In the online ideation, there were six times as many participants as in face-to-face service testing. However, only half of the users took part in the online discussion after answering the survey, and only few users came to comment more than once. In the service testing study, instead, all six users were more or less active in commenting the service. Users were committed to participate for three hours and could not easily leave earlier; as opposite to the online study which users could easily quit. The collective experience in a testing team was also engaging, and kept people interested until the end. In the final discussion, a couple of people were louder than others, which may have affected that everyone's opinions did not get the same weight. The benefit of online discussion was that also quiet people had a possibility to express themselves.

Quality of user input

The online ideation resulted in new service concepts, since the users had no experience of the existing service prototype and they were free to imagine. There was a group of ideas that consisted of pretty radical ideas. They were based on collaborative ideation in the discussion forum. The ideas combined concrete and innovative elements that were familiar from other sources, e.g. from movies and television series. The problem with these ideas was, that they seemed difficult to implement, since they include also impossible elements, such as teleports. These futuristic ideas could, however, be used in the company workshop as a source of inspiration. The company is challenged to invent how to implement the fancy elements in practice.

However, there were also many adventure ideas that were not really new, but consisted elements that had been used in some other adventures and tourist services. One could criticize that the result is not very innovative or new, but a combination of multiple old elements in a new context is a common way to create new services. Service innovations can be based on changing some elements of the service, such as the concept, customer interaction or delivery system (den Hertog 2010). Even if the users did not entirely design new services, the value of user participation would be that the company received reminders of things that were related to adventures as potential elements in their service. The discussions serve as a good material to develop services further, and be aware of the aspects that are important in customer expectations and experiencing the adventures.

The face-to-face service testing was an important part of the service design process, since an adventure cannot really be imagined without testing and experiencing it. Service testing resulted in concrete development of ideas that can be easily applied into practice, since they were directly related to the existing elements of the service concept.

Facilitation of the process

Based on experiences from this and other cases in Owela (e.g., Näkki 2010), the facilitation of online co-design process is more challenging than traditional face-to-face methods, such as interviewing, focus groups and workshops. The face-to-face methods require a lot of preparations - but so do the online methods. Formulating questions and preparing good inspirational material that will work online, is a time-consuming task. In addition, the researcher cannot control the study in the same way than in a face-to-face situation. There were, e.g., 11 people who joined the study but did not even answer the survey, and thus could

not continue to the discussion part. The researcher could not persuade these people to contribute more, since she did not have any other contact to them besides email.

In online settings, it is also more difficult to guide users to do tasks in the right order. In this case, users were technically forced to answer the inspirational survey first, which allowed the research to control that they read the stimulation material and remembered past experiences first. During the discussion phase, it was more difficult to guide people to answer in all topics and find the discussions that could trigger the new ideas. In an online environment users can also understand the questions in so many ways, and not always respond in a way that was expected. In a best case, this can of course even lead to interesting new ideas, and the company representatives can participate directly in the discussions with users.

In this case, online ideation worked also as a recruitment channel and inspiration for the more time-consuming real-world testing. Some users travelled a long way to participate in the service testing without any compensation, because they were interested about the project based on the online discussions. The physical service testing required a lot of arrangements, especially from the service company that needed to prepare the adventure for testing and involve three employees for the test. Also the time of two researchers was needed with preparations and analysis afterwards. This work needed to be done only once, but it was also a little risky to arrange the test session only once, since there were a lot of elements (e.g. technology, weather, and group dynamics) that could have resulted in problems.

Table 5. Key elements of different methods

| | Online inspiration survey | Online discussion | Face-to-face service testing |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Participation | A lot of participants (N=36) Thin involvement | A lot of participants (N=18) Varying level of participation | Limited number of participants (N=6) Strong commitment |
| User input | Personal opinions Memories and stories | New and surprising ideas Honest critique about the service concepts | Practical problems and improvement ideas to the service prototype |
| Facilitation | The questions and material must be well-thought-out in advance, which requires a lot of time but survey can be easily pre-tested | Company can collaborate with users Difficult to direct discussion, requires continual presence | Difficult to schedule a meeting with many people Test session has limited time and is not controllable |

Conclusions

This paper presented a case study in which potential users of a city adventure service participated in co-design activities both online and face-to-face. Online ideation gave a lot of inspiring material for the service company to develop their services further. Face-to-face service testing proved to be very useful in improving the details of the service and it resulted with more concrete suggestions than the online discussion. However, service testing is possible only with few users since it requires more resources than online discussion.

We suggest that the online ideation is a good starting point for service companies to begin to develop their services or invent new service concepts. Users have a lot of capability, but it must be focused correctly with clear and inspiring tasks and benefits for the users. At the moment, the online methods cannot replace the physical service experience, and therefore face-to-face testing needed as well. However, online ideation reaches more people with low cost and therefore it can be used especially in the design stages which include a lot of different opinions and viewpoints. In comparison to online surveys, open discussion enables users' interaction and thus building on each other's ideas.

In our case, the company representatives were active in the service testing, but not in the online ideation. Although users were able to develop some totally new service concepts online, they did not fit well enough the goals of the company. In order to benefit more, the company representatives should play a bigger role in the online idea generation. The employees could explain some of the restrictions in their service offering or challenge the users to develop more radical service concepts by adding inspiring questions to the discussion along the study.

Even the short time user participation in the service design process resulted with useful ideas for the company. However, the users were still considered as a source of input that the company might use when they further develop their service instead of full members of the service development team. The users did not have the power to change things, or even receive the product as a token of their participation. Online tools would enable also long term co-design with users but it requires that users are able to share the goals and values of the service company as well as gain apparent benefit from their involvement (see Kristensson et al., 2008).

As a future direction in the development of the online method, more visual elements could be used in ideation. In Owela, the current interaction methods are mainly based on writing text. Pictures and videos have been used as triggers for ideas, but more creative methods for co-design could be developed, such methods are, e.g., collaborative storyboarding and video editing. More research is also needed to evaluate, if and how online tools can be used to replace the service experiencing in real world. Simulations of the service could be presented as storyboards and videos online, in order to engage more people to contribute in that phase, even in a more limited way.

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Giving Voice to Service Design in the Management Boardroom

Strengthening the Connection between Service Design and Management

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Abstract

Service design is an interdisciplinary field with significant potential to improve service innovation, but it is still not a well-established practice in most organizations and the management implications of service design are still not well understood. Better integration of design and management perspectives is needed for a wider diffusion of service design. This paper explores how Multilevel Service Design (MSD), an interdisciplinary service design approach, can better connect management concepts and tools with design concepts and tools. A case study of redesigning a bank's mortgage service is presented, using MSD Customer Value Constellation and the Service System Architecture models. The case study illustrates how this approach can help service designers and managers navigate between service concept and service system design levels, and better understand the interconnections between the design of the service at the frontstage and the design of support processes and technologies.

KEYWORDS: service design, interdisciplinary service design, multilevel service design

Introduction

The growing importance of services in the global economy and the need to improve corporate competitiveness has brought service innovation to the forefront of research and practice priorities. Companies need to go beyond merely improving efficiency and refining existing service models, and focus on service innovation by finding new ways of value co-creation for customers and the firm (Patrício and Fisk, 2011).

Service design has been identified as a research priority and plays a key role in service innovation because it brings service strategy and innovative service ideas to life (Ostrom et al., 2010). Service design is an emerging interdisciplinary field that integrates different contributions from interaction design, management, marketing, operations or technology (Kimbell, 2011, Meroni and Sangiorgi, 2011, Ostrom et al., 2010, Stickdorn and Schneider, 2010). As an interdisciplinary field, different service design approaches have been developed. Research and practice from interaction design has approached service design with a strong focus on enhancing the customer experience through the design of service interfaces and customer journeys (Meroni and Sangiorgi, 2011). From this perspective, service design can be defined as a process that involves understanding users and their context, understanding service providers and social practices, and translating this understanding into evidence and service systems interaction (Evenson, 2008). . Service Science provides a broader view of service design, involving all stakeholders and service system components. From this perspective, service design can be defined as the orchestration of clues, places, processes, and interactions that together create holistic service experiences for customers, clients, employees, business partners, or citizens (Ostrom et al., 2010).

Service design has gained increased attention, but it is still not a well-established practice in most organizations and the management implications of service design are still not well understood (Gorb and Dumas, 1987, Ostrom et al., 2010). Managers frequently engage in design activities, as they study the customer experience and make decisions on service concepts and service systems, but they don't recognize them as such, nor do they use formal design methods and tools. According to a study of UK companies, this form of silent design, i.e., the undertaking of design activities by those not trained as or recognized to be designers (Gorb and Dumas, 1987), appears to be the dominant approach to design in service firms (Tether, 2008).

A wider diffusion of service design practices in organizations has significant potential to improve service innovation. However, further work is needed to strengthen the connection between management and service design. This paper shows how Multilevel Service Design (MSD) (Patrício et al., 2011), an interdisciplinary service design method, can contribute to integrate the concepts and tools from these approaches. A case study of applying MSD to redesigning a bank mortgage loan illustrates how the customer value constellation and the service system architecture models of MSD can be used to integrate management and design decisions and to navigate across different levels of service design. The last section discusses research and practice implications and future research.

Service design models

Service design requires orchestrating a set of integrated components, which together enable customers to co-create valuable experiences. Designing for services involves designing the service value proposition the company will offer to its customers; designing the service interfaces in the frontstage that will enable customers to co-create their service experiences; designing the support processes in the backstage that will enable service provision in the frontstage; and designing the technology solutions that will support both frontstage and backstage activities.

Service design can also be addressed at different levels: (1) the service value proposition and its positioning in the value network (service concept); (2) the service system that enables the customer to co-create the service experience across the customer journey; and (3) the service interaction at each touchpoint (Patrício et al., 2011). These different levels should be integrated, as it is necessary to make recurrent leaps between designing in detail and designing holistically (Stickdorn and Schneider, 2010). Models are especially useful for designing these complex service systems, as they help interdisciplinary teams visualize and understand the different elements of the system and how the elements interact. This makes it easier to bridge different points of view and address higher levels of complexity (Dubberly et al., 2008).

The service concept can be defined as the set of benefits that a service is expected to offer a customer (Edvardsson et al., 2000). Several models have been developed to support this level of service design. From strategic management, the value constellation model represents the network of actors and their relationships that jointly create an offering (Normann, 2001), but its main focus is the company's strategy and not service design. More recently, Morelli and Tollestrup (2007) developed the actor network mapping, which gives an overall perspective of the network of actors and components of the system, focusing on roles, grouping, and relations. Evenson (2008) has developed a systems approach to service design, which involves the development of the stakeholder map. However, these models are used to map the existing contextual situation, and are not used as a tool for designing the service concept and positioning the firm's value proposition.

Based on Maglio et al. (2009), the firm's service system can be defined as the configuration of resources, such as people, processes, artifacts and technologies, that enable customers to co-create value. To support its previously defined service concept, the firm needs to design the service system, which includes defining the mix of service interfaces, support processes, people, physical evidence, and their interconnections. In service design, the customer journey is used to map how the customer experiences the service across different touchpoints and service interfaces (Miettinen, 2009, Stickdorn and Schneider, 2010). However, the customer journey does not map how the service system should be designed to enable the desired service experience. Managers need to analyze the implications of how different customer journeys affect the multi-interface mix, backstage processes or supporting technologies.

Existing service design methods have a significant potential to improve innovation and enhance the services offered. However, a closer connection between the language and tools of design and management is needed to make this contribution more widespread and

effective in the management boardroom. This paper explores how Multilevel Service Design can integrate the perspectives of design and management for service design.

The Multilevel Service Design (MSD) Method

The Multilevel Service Design (MSD) method has synthesized contributions from interaction design, service science, management and engineering to build an interdisciplinary approach to service design. The Multilevel Service Design (MSD) method enables integrated design of service offerings at three hierarchical levels with a strong focus on the customer experience (See Figure 1): designing the firm's service concept; designing the firm's service system; and designing each service encounter (For a more detailed description of the MSD method see Patrício et al. (2011)).

The MSD process involves four steps (Patrício et al., 2011). Following a service design approach, Step 1 starts with an in-depth study of the customer experience, but it does so at different levels. In-depth studies with customers enable the decomposition of the different activities and context of the customer experience and the identification of the most important experience factors.

- The value constellation experience is co-created through the interactions between the customer and all service organizations that enable a given customer activity, such as buying a house.
- The service experience is co-created through all interactions between a customer and a firm's service system to accomplish a given service activity, such as mortgage loan service experience. This service experience comprises all the different service encounters with the firm across different service interfaces, and can be seen as the result of the customer journey.
- The service encounter experience is co-created through customer interactions at a given service interface for a service task, forming a touch point. This concrete interface level has typically been the primary focus of interaction design.

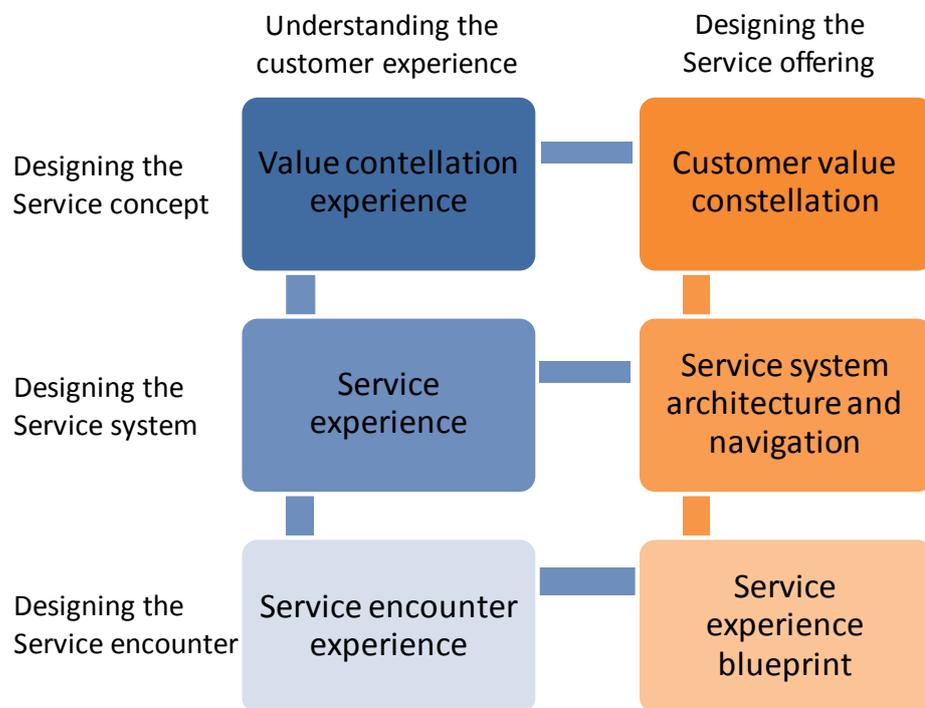


Figure 1: Multilevel Service Design

In Step 2, based on the study of the customer experience, the customer value constellation (CVC) model enables designing the service concept. The CVC represents the set of service offerings and respective interrelationships that enable customers to co-create their value constellation experience for a given customer activity. In Step 3, the firm's service system is designed through the Service System Architecture (SSA) and Service System Navigation (SSN). The SSA defines the structure of the service system, providing an integrated view of the multi-interface offering and support processes across the service experience. The SSN maps the alternative paths customers may take across different service encounters forming the service experience. Each path represents one possible customer journey across different touchpoints or service encounters. In Step 4, The MSD method uses the Service Experience Blueprint (SEB) diagram (Patrício et al., 2008) to design each concrete service encounter. With this multilevel perspective, the MSD method offers a holistic view, from the service concept level, to the multi-interface service system level, and to each service encounter.

By integrating the concepts and tools of design and management, MSD allows for better integration of these two perspectives for service design. First, by merging the stakeholder map and value constellation into the CVC, MSD allows mapping the value network from which the customer co-creates value, but also analyzing new service concepts and how they reflect the firm's strategic positioning. Second, by developing the Service System Architecture and Navigation, MSD allows mapping and analyzing potential customer journeys and shows how backstage processes and technologies need to be designed to support the customer experience. The next section illustrates how the CVC and the SSA can help bridge the gap between service design and management through a case study of a bank's mortgage loan service.

Case study of the redesign of a bank mortgage loan

Applying the Customer Value Constellation (CVC) to design a new mortgage service concept

In MSD, the service concept is defined as the firm's positioning in the Customer Value Constellation (CVC), including the service offered and the partnerships established (Patrício et al., 2011). As shown in Figure 2, the case of a bank mortgage loan, the CVC maps the set of service offerings and respective interrelationships that enable customers to co-create their value constellation experience for buying a house. Some of these services are offered by the bank (e.g. mortgage loan), and some are offered by other companies (e.g. real estate broker services). As such, the CVC represents the existing service solution in a broader context, highlighting other offerings that customers use to co-create their house buying experience, which can be reconfigured into innovative service concepts.

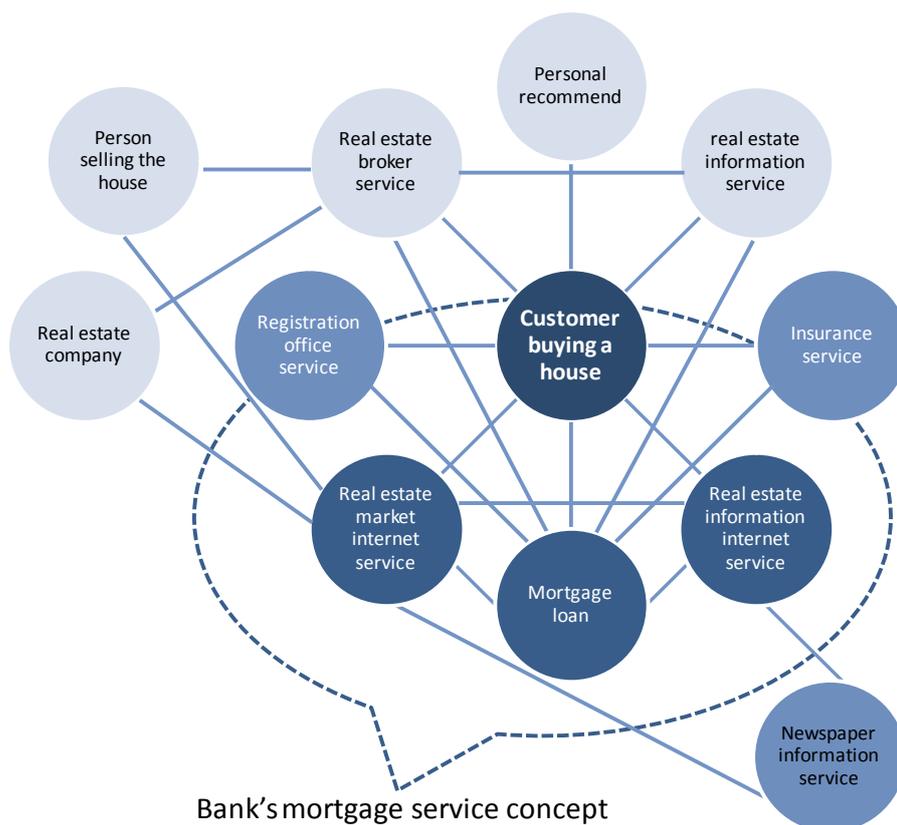


Figure 2: Bank's design of the service concept in the customer value constellation

By viewing mortgages as integrated within a value-creating network for buying a house, and by understanding that the process of house search and mortgage search are often done in parallel, the bank recognized the opportunity to investigate new possibilities for offering

service offerings and move beyond the boundaries of the basic mortgage service. In this case, the bank partnered with registration offices and insurance companies to facilitate the house buying process. The bank also partnered with an important newspaper to develop an Internet service that combines general real estate information, listings of homes for sale, and the mortgage information they had previously provided. The service supports individuals, real estate companies, and real estate brokers. The new service allows potential buyers to search for houses, specifying several characteristics such as location, number of rooms, or maximum price. For each information screen for a specific house, there is information about the bank's mortgage service with a simulation that allows customers to easily input their mortgage conditions and learn the monthly amount they would pay.

With this new service concept, the bank enhanced the customer experience while strengthening its strategic position. The CVC helped expose this opportunity, reconfiguring and repositioning the bank's service offering by integrating service offerings that were previously beyond the bank's boundaries..

Applying the Service System Architecture and Navigation to redesigning the bank's service system

The design of the service system operationalizes the value proposition. To offer the set of benefits defined in the new mortgage service concept, the bank needed to orchestrate a set of service interfaces, processes, tangible evidence, technology and people, which enabled customers to co-create their desired service experiences.

The MSD method uses the Service System Architecture (SSA) and Navigation (SSN) to design the service system. As shown in Figure 3, the top row of the SSA depicts the main tasks customers perform to acquire and use a mortgage loan. The column of the SSA depicts the service interfaces (in the frontstage) and the support processes and technologies (in the backstage), that enable customers to co-create their experiences. The body of the matrix shows the service interfaces and backstage activities that support each customer service task. Each cell depicting a service task performed in a given service interface represents a touchpoint. The sequence of touchpoints across the different tasks and service interfaces forms the customer journey. With this matrix view, the design team can explore and map different possible customer journeys, forming the Service System Navigation (SSN), and can then analyze their implications in terms of backstage processes and technologies. In the case of the mortgage loan, the study showed that some customers preferred to conduct their customer journey online. However, the existing service system did not allow it, because there was no online advice and the contract had to be signed in the physical bank branch. Based on the work of the multidisciplinary team, telephone advice was added, but due to legal constraints, the contract formalization continued to be performed in the physical branch. On the other hand, a smooth service experience across different stages and interfaces required the integration of legacy information systems for an integrated view of the customer. The visualization of the interconnections between the customer journey and backstage processes and technologies therefore enabled a clearer understanding of service system design possibilities by all member of the multidisciplinary team.

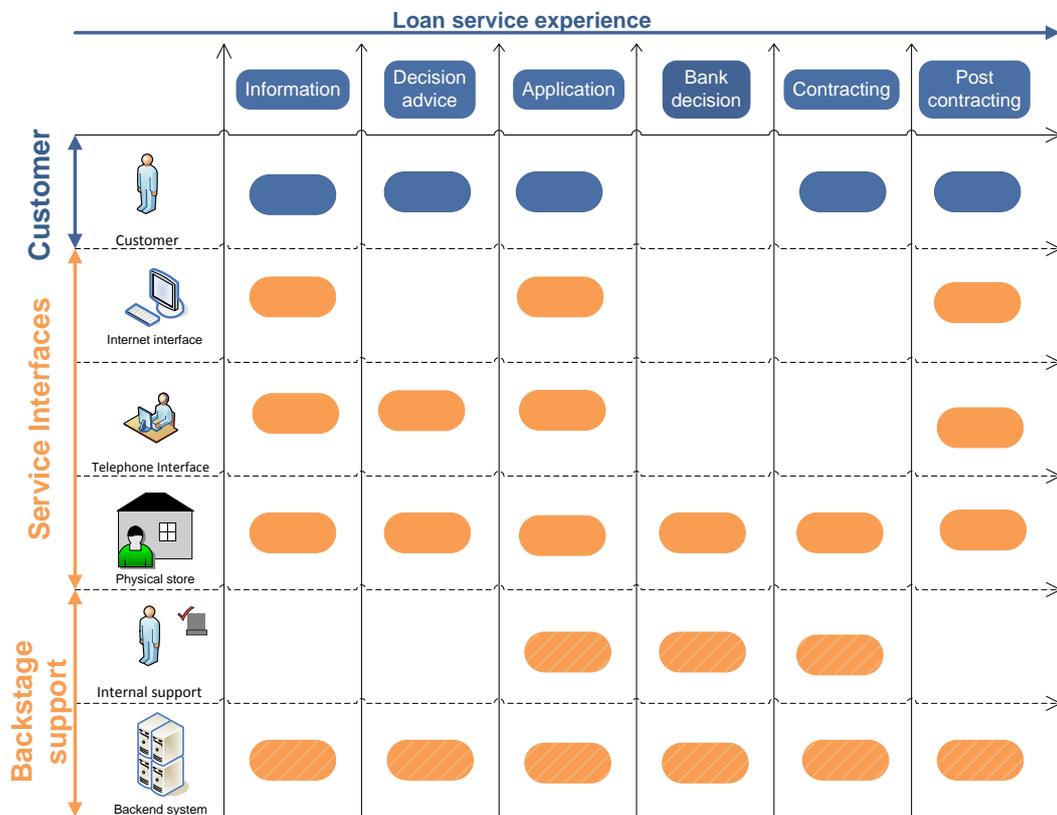


Figure 3: Service system architecture for the mortgage loan service

Conclusion

Service design plays a crucial role in service innovation, and has evolved significantly in the recent past. As an interdisciplinary field, it requires an integration of different perspectives to address the richness of customer experiences and service complexity. However, further work is still needed to synthesize design and management perspectives so that service design becomes a well-established practice in organizations and has a strong voice in the management boardroom.

This paper explored how the interdisciplinary MSD approach integrates concepts and models to help service designers and managers work together for developing innovative service solutions and respective service systems. This interdisciplinary approach makes the service design process and outcomes more understandable and closer to management concerns, linking them to established concepts and tools. This interdisciplinary approach also allows better communication between members of the multidisciplinary team: operations managers can see the implications of design decisions at the interface level in backstage processes (example of online advice or online loan application). IT managers can see the impact on technologies and information systems of their design decisions (example of integration of legacy systems to provide an integrated view of the customer journey across

the different touchpoints). MSD also allows managers and designers to navigate across the different levels of service design, better understanding the interplay between strategic decisions at the service concept level and operational decisions at the service system level.

Understanding the crucial role of customer experiences and the growing complexity of service systems creates the need for interdisciplinary approaches to service design. This paper addressed the integration of service design and management, but hopefully encourages research on the integration of different areas of service design, towards a more holistic approach to service innovation.

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Developing ICT based services for Intellectually Disabled People

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Abstract

Information and Communication Technologies (ICT) have become part of everyday life in recent years. ICT can provide people with dignity and well-being through self facilitation. ICT in healthcare, like the Internet, really helps the intellectually disabled people to enrich their life. Intellectually Disabled People can take advantage of ICT as a force for social inclusion.

The case company is a small and medium sized organization working in the health care industry. The case company needs a business model for its operations. The objective of my research is to develop a business model for the case company. The tool used to develop the business model is business model canvas. This report further describes the methodology that will be used.

The result of the study is a comprehensive business model that can be implemented in real life use. The business model generation can be used by other similar sized (small & medium) companies as well.

KEYWORDS: Business model canvas, Business model ontology, Information and Communication Technologies (ICT), Qualitative research.

Introduction

This paper describes the designing process of a new business model for Information and Communication Technology (ICT) based services. The purpose for generating a new business model is to improve customer experience, and thus increase the turnover for the case company by using ICT based services.

ICT technologies create an opportunity for new service offerings (Meuter et al., 2000). Telecommunication, for instance, offers cheap international calls through internet. Online shopping allows a customer to purchase a product from any part of the world. Inventions in the ICT sector has led to a service revolution (Vargo & Lusch, 2004, p. 4) and these inventions create the opportunity for new services in the health care industry as well, where the case company is competing.

A company has to be always focussed on its customers to make them happy and thereby keeping them loyal by providing innovative services – especially in an environment where the pace is permanently increasing. The case company concentrates in providing ICT based services for intellectually disabled people. Since the case company has already gained major market share and expanded its operations in its key customer segments, it has now considered essential to improve the customer experience, in order to maintain and raise its revenue. The challenge, that the company is facing now, is to develop a business model and continue to adequately satisfy customers, thus being able to sustain and lift company's returns.

Research Objective: The objective of my research is to find out what are the key issues that need to be considered in order to succeed as a service provider in the healthcare industry. The issues that are found to be important have to be addressed by the example of the case company. Providing a service solution in the healthcare industry requires a fresh business model in order to improve the customer experience and thereby to maintain and raise the company's revenue. Henceforth, the goal of this study is to define a business model to provide ICT based services for intellectually disabled people, in order to improve the case company's profit and customer value.

Scope and Benefit of the Research: A new business model is generated on the basis of existing knowledge on business models and findings from the brainstorming sessions with the case company's management. The scope is limited by the amount of the relevant literature found by the researcher and by the number of brainstorming sessions that will be conducted. The issues that will be discussed in the study will be applicable to small and medium sized companies operating in various fields of business.

Significance of the Research: My business model assists in the design of the case company's business plan. At the core of every business plan must be a business model to describe and illustrate the way an organization creates value and makes money.

By designing and working through a new business model, my case organization will understand all the components of the business better and the business model can be used as a great platform from where to write the business plan.

Structure of the Research: The target of my study will be to seek out issues that have to be taken to account in business model creation. The issues that company faces have been collected from literary sources and formulated into a map of questions. With this map of questions, answers will be gathered from stakeholders to create a business model that is useable for the case company. A design tool called the Business Model Canvas, which was created by Osterwalder & Pigneur (2009), will be used in my research to generate the intended business model. The comprehensiveness of Osterwalder's (2004) business model forced me to choose his business model ontology for developing the business model.

Business Model Canvas

It can be described by looking at a set of nine building blocks. The layout of the nine components has its importance. The nine building blocks with its layout are depicted in Figure 1. At the centre there is the *Value Proposition*, it describes which customer's problems are solved and why the offer is more valuable than similar products from competitors (product, service). The customer themselves are analyzed in *Customer Segment*, separated into groups to help in identifying their needs, desires and ambitions (singles, families). *Distribution Channel* illustrates how the customer wants to be reached and by whom he is addressed (Internet, store). In addition, *Customer Relationships* specifies what type of relationship the customer expects and how it is established and maintained with him (promotion, support, individual or mass). To be able to deliver the *value proposition* the business has to have Resources (staff, machines, secret knowledge). And transform these resources through *Key Activities* into the final product or service (development, production, secret process). Most of the time a business depends also either for resources or for activities on an external *Partner Network* (logistics, financial), which can provide better quality or a lower price on non essential components. As any business model would not be complete without financial information the last two building blocks focus on cost and revenue: The *Cost Structure* which should be aligned to the core ideas of the business model (key resources, key activities) and *Revenue Streams* which mirrors the value the customers are willing to pay and how they will perform the transaction (one-time fee, subscription).

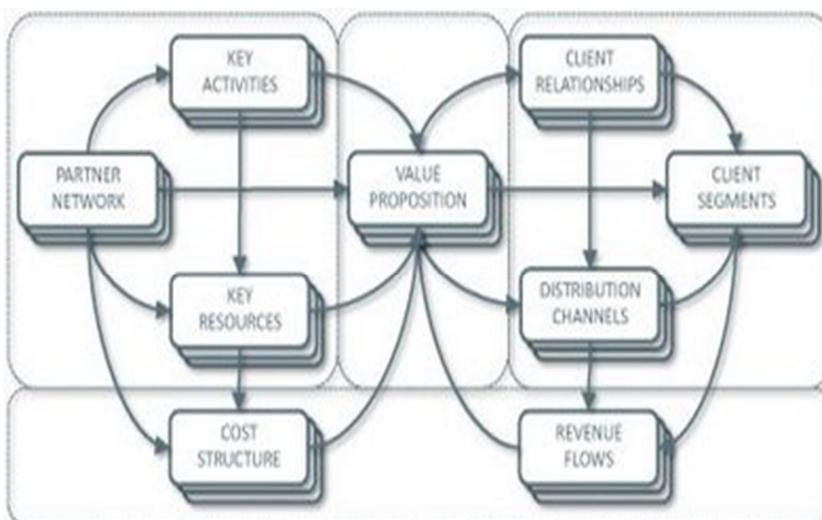


Figure 1 shows Osterwalder’s nine building blocks and its relationships (Nonlinear Thinking website).

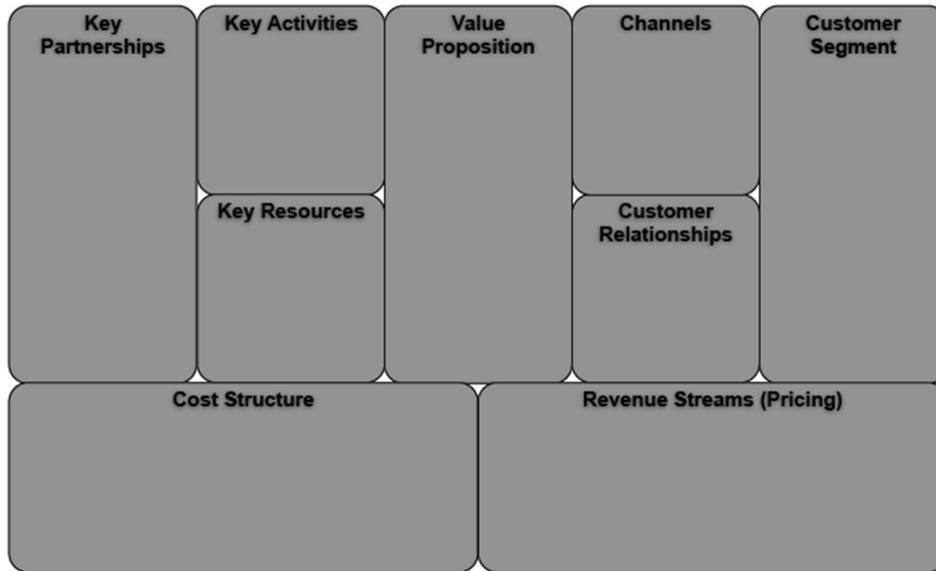


Figure 2 shows the Business Model Canvas.

The most interesting feature of this canvas is the ability to describe the business logic of a company on one page: none of the individual elements of the business model canvas are new to business people. The simple and yet holistic look at a business on a single page is the main attraction of this model. The above figure (Figure 2) shows Alexander Osterwalder’s Business Model Canvas. By looking at the figure it is evident that Osterwalder has developed a powerful method to capture all elements of a business model: propositions, partners, activities, resources, customer relationships, channels, customer segments, costs, and revenue streams.

Methodology

This chapter will give an explanation of how this study will be dealt with. An explanation will be given of the chosen tools, alongside of the reason for this choice. After that, the approach of getting to the solution is described, followed by a description of criteria to test the validity of this solution. The intermediate steps taken to reach this solution are explained, and finally some other details on how to find required information are mentioned.

Research design: As the nature of ‘Business model generation’ indicates the social science research methods should be applied rather than quantitative study. In this regard, my study will use qualitative research which is “an inquiry process of understanding” where the researcher develops a “complex, holistic picture, analyzes words, reports detailed views of informants, and conducts the study in a natural setting” (Creswell, 1998, pp. 15). The motivation for selecting qualitative research is because the qualitative research methods are designed to help researchers understand real life situations, more specifically to understand people, organizations, organizational resources, processes, relationships etc. Kaplan and Maxell (1994) argue that the goal of understanding a phenomenon from the point of view of the participants and their particular social and institutional context is largely lost when the textual data are quantified.

Data collection: The business model could be created only by answering the questions prepared after analysing the most important issues. In this regard in-depth interviews would best inform my map of questions. I will conduct in-depth interviews with stakeholders during the workshops in order to understand the company and the services provided. I will document and analyze the gathered information.

Justification for the chosen method: The reason for choosing interviews is that it contributes to the deep description of the organization and the issues considered. Additionally, subjects like business modelling and management information are of a subjective and complex kind. This would have made it hard to choose data collection methods such as questionnaires, since it would have given interviewees the possibility to prepare in advance for the interview and also the interviewer can make sure that the answers given will be exact. In addition, questions regarding this kind of subjects sometimes need to be rephrased to make the respondent understand the correct meaning of the question, which is hard to do with other data collection methods than interviews.

Method of execution: The expected task sequences that will be followed in order to collect data are given in this section. Questionnaires will be sent to the participants before the interview so that interviewees can prepare beforehand. During the interview sometimes follow up questions will be necessary in order to make a complex reasoning more understandable or to make the interviewee express her- or himself more clearly. While conducting the interview the Business Model Canvas of Osterwalder and Pigneur (2009) was also used in order to encourage respondents to describe their view of the organization. During the interview, notes will be taken, will fill up the canvas. The workshop will be stopped when saturation is achieved in the sense that all information is gathered and further interviewing did not contribute with much new information.

Data analysis: I have experience with in-depth interviewing, henceforth I will be able to conduct and transcribe all of the interviews myself. I will analyze the qualitative data using Strauss's (1987) guidelines in *Qualitative Analysis for Social Scientists*. After each interview is transcribed, the transcript will be read several times and analyzed into emergent conceptual categories. The focus of the analysis is on data in the form of words, emanating mainly from interviews conducted. These words require processing, which in itself is a form of analysis (Miles & Huberman 1994).

Data reduction, data display and conclusion drawing are the three steps of qualitative data analysis (Miles & Huberman, 1994). The reduction of data is an analysis that organizes the data and allows for final conclusions to be drawn. In my thesis data from the interviews will be reduced through comparing the data with the issues considered, sorting out important data. In the second step, data display, empirical data about the organization and its services will be displayed as per the business model canvas. In the third step, conclusion drawing, the collected data is used for discussing and concluding.

Validity: Validity is a concept that measures the truthfulness of research and exists in many different forms (Bryman and Bell, 2007). The three most fundamental forms of validity that is discussed in this report are construct, internal and external validity. Construct validity implies that a study actually measures what it is aimed to measure (Bryman and Bell, 2007). I will ensure construct validity by defining the business model clearly with the help of literary sources, by discussing the important issues; which is used as a basis for forming the map of questions and also by presenting the filled business model canvas to the company management to ensure the efficacy of the model. Internal validity implies that the right people with the right competence are interviewed and that causal relations exist between the measured variables (Bryman and Bell, 2007). In my study different sources and organizations top management will be included to gather needed information which assures internal validity. External validity means that the research can be applied in a broader perspective in order to generalize the conclusions (Svenning, 2003, pp.66). The external validity of my study can be confirmed in an objective manner since many of the results are based on the issues considered which can be applied to similar sized company (small and medium size).

Time Schedule: I am planning to conduct the workshop with stakeholders by the month of January. By end of January I will summarise my field work and will complete my research paper with findings, discussion as well as conclusion. In this regard, by February when the ServDes conference will be conducted, I will have complete set of data with a fully packed research paper.

Conclusion

My study will lead to the business model canvas for developing ICT based services for intellectually disabled people. The created model is evaluated on the basis of reusability in other companies and business and overall as a business model. My work could be used by the case company in future as a reference for implementing appropriate solution with other tools or technologies.

Summary

The purpose of my research is to develop a business model to develop ICT based services for intellectually disabled people. To be able to do this, Alexander Osterwalder's (2009) business model canvas is selected.

The target of the study will be to seek out issues that have to be taken to account in business model creation. The issues that company faces will be collected from literary sources and formulated into a map of questions. With this map of questions, answers will be gathered from stakeholders to create a business model for the case company.

My study will focus on the development of a new business model, using a qualitative approach. Main data collection methods used will be workshops, interviews and questionnaires. During the interview, notes will be taken and will fill up the canvas. The collected data will then be analysed and evaluated.

The model will be applicable to the entire small and medium sized companies operating in various fields of business. So generalization possibility is high. In addition to this, the case company could use this model in future as well.

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Deep inside friendly territory

Involving remote co-researchers to understand global users

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Abstract

The aim in this case study is to explore how to do contextual research in a remote and global context, in which cultural issues play a major part. We executed and evaluated a design research project on a flight-cabin crew-rest area. In this paper a design research method is laid out to obtain information from global users about their experiences, used for design projects, by engaging non-professionals in the research. We found that this collaborative way of doing design research can be very effective, but requires involvement of co-researchers throughout the various research activities, beyond data collection only. In addition, the collected data identified many themes, but needed an additional step, in the shape of a contextmapping-session to reach in-depth information.

KEYWORDS: global design, co-research, remote research, culture, user research

1 Introduction

Many products such as televisions, mobile phones and sport shoes are designed with the intention to serve people in different places and situations all over the world. However, products tend to diversify regionally: The older the product category, the stronger the influence of culture is (de Mooij, 2004). Whenever

possible, products tend to be adjusted to local situations, thus increasing their financial, utility and social values. For instance, in rural India the value of mobile phones increases if their users can easily share them by incorporating multiple address books and payment accounts (Lindholm, 2003).

The case we study in this paper is to design one global solution that will be accepted by multiple cultures. In this study Hofstede's (2005) cultural theory has been applied on a national as well as a professional level: the members of the group (in our case cabin crew-members) cope in a specific way with each other and with the situation due to both their national background and their professional context. Different crews from different nationalities and airlines will use the final design of a crew rest cabin; the place crewmembers sleep during longer flights, worldwide and adapt the crew-rest service to the global solutions (the physical product) offered. By doing so they utilize and adapt the solutions confronted with. Our aim is to serve different preferences in advance and bridge eventual possible cultural gaps. Another factor that complicates the design task is that the product service system to be designed is being used in a mobile environment (flying airplanes), which means that the design research, needed to understand user experience on personal, cultural and universal level, cannot easily be done on a specific location. Flight personnel with crew rest experience is difficult to reach since they live in many different paces in the world and when travelling they are occupied with their job. Besides, legislation of airlines is very strict, because of safety reasons and therefore, on-the-job observations, interviews and Experience Sampling Methods (Consolvo, 2005) are not allowed.

Designing for, or researching large, scattered and global-users is especially hard as it is a costly, time consuming practice. Beside, the money and time issues, it is difficult to create a good insight into individual, cultural and universal behaviors, needs and values.

Central question in this case study is therefore how to do contextual research in a remote and global context. The sub-questions are: (1) Is it effective and efficient to work with remote co-researchers and when? (2) Which factors do design researchers have to take into account when incorporating remote co-researchers in their project? (3) What are barriers and limitations for the use of remote co-researchers in design research projects? To answer these questions we executed and evaluated a design research project.

In this paper a design research method is laid out to obtain information from global users about their experiences, used for design projects.

We first discuss some of the theoretical perspectives on the concept of culture and co-research. Then a case is presented, in which travellers in the role of co-researchers are involved. Furthermore, the process of designing, organizing and executing of this research project is described, concluding with a discussion of some of the main insights derived from this case.

1.1 The concept of culture: D-L-L-D

For the definition (D) of culture we follow Hofstede (2005): 'The system of shared beliefs, values, customs, behaviours, and artefacts that the members of a society use to cope with their world and with one another, and that are transmitted from generation to generation through learning'. We mainly look at two levels (L) at culture; on a national (crews from different countries) and professional (airlines) level. For the manifestation or practices of cultural values, we look at all layers (L) (symbols, rituals, heroes and). Finally, the cultural dimensions (D) of both Hofstede and Trompenaars (Trompenaars, 1998) are used to understand on what dimensions differences are expected.

1.2 Remote co-research

Engaging people to do a joint research project is common practice in the field of participatory design (Avison, 1999). Co-research refers to the involvement of non-researchers in order to execute a research project in a domain they know well. They are not only reporting about their own experiences as is done in participatory action research, but are actively involved in designing and doing the research. In the field of design research, Van der Lugt (2007) involved members of an organization as co-researchers as part of an initiative to re-define the human resource services of the organization. The participating co-researchers received an inspiring research kit and were instructed in a workshop to enable them to reach sufficient 'depth' in the conversations. Then, they were asked to interview a number of employees in their direct context. With 20 co-researchers, this led to about 100 in-depth stories of employees' experiences. These experiences were then interpreted and structured in a collective effort by the co-researchers, leading to a set of 3 personas that were used by the design team.

We have applied co-research as a means to gain access to experiential worlds of people that are hard to reach. The adaptation to co-research, which we refer to as 'remote co-research' is different. The involved people (frequent flyers), who investigate the experiences of professional staff (the cabin crew) were not experts of the research domain and they were not travelling to the context of research specifically for the research. They combined this research aim with a personal one. We involved these frequent flyers for practical reasons in order to achieve a global perspective on the crew rest experience.

2 Case: a global crew rest service design

The design project was part of a graduation project of a master design student (first author) and has been executed in consultation of a company, designing and producing crew rest cabins. This engineering driven company identified the need to move from a design problem solving way of thinking to an inquiry and service based thinking to secure its position as market leader (Kambell, 2011). From a concrete engineering-focus the attention moved to an abstract-values-focus to serve crewmembers during their work. This move led to the start of a design research-project to understand the user experiences of their crew rest cabins.

2.1 Preliminary research

The project started with a local contextmapping session with 4 Dutch crewmembers to find out what variables could be important to investigate the user experiences. This session served to identify crude directions and a knowledge gap that could be investigated with a literature study and field research.

2.2 Design of the research approach

A half-day design session with 3 design researchers, 2 company members and a graduating student, was organized with the aim to find strategies to fill the knowledge gap. One of the strategies was to involve remote co-researchers. Furthermore, solutions were generated for the selection and recruitment of remote co-researchers and their research tasks and means. Based on the knowledge gap 'research kits' were developed to support the co-researchers to do their research.

2.3 Remote co-research

For the remote co-research we found 6 frequent flyers motivated to do the research. In total they had sessions with 19 crewmembers from 7 crews in 8 nations. Because six different people acted as researchers, bias was minimized, as specific answers are not unintentionally evoked or recognized by one person.. In total 19 kits were analyzed.

The remote co-researchers had to be empowered to ask and say the right things. To do so they were individually trained during the meeting in which the research kit was handed over. In that meeting the research was demonstrated with the remote co-researcher being the participant, to get a better understanding of the questions and to create empathy with future participants. The first thing explained was the motivation and goal for this research; what the research team was looking for and which themes the team believed to be of special interest. It was important for the remote co-researcher to realize that the preferred results were not problems or improvements per se, but rather interesting stories and anecdotes from crewmembers. After this introduction, a booklet with questions, which is part of the research kit, was used with the researcher acting as remote co-researcher, showing how it should and could be done. The result, a filled out booklet, was discussed afterwards, creating the foundation for the remote co-researcher to work with. The filled out booklet with results and remarks was taken by the remote co-researcher and acted as a reminder to the training. It was recommended to read the booklet just before the start of the sessions with participants.

2.4 Research kit

The first version of the research kit was created by the design-team alone. But subsequent iterations were improved based on input of the remote researchers and end-users.

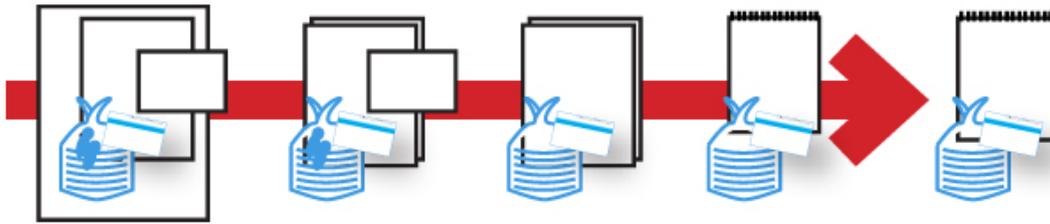


Figure 1 From left to right: The research kit improvement process

The first version of the booklet appeared to be too 'open' as the answers were not rich enough. Furthermore, the different paper sizes and loose papers were very hard to handle, the researcher had to stand instead of sitting down with a crewmember and there was much less time for sessions with participants available than expected. This resulted in the second version of the kit, which was all A4 size. The third version removed the opening 'sensitizer' (a kind of business card for the participant), as it was un-useful. The fourth version took the shape of a booklet, taking the researcher by the hand in order to retain more anecdotes and richer information. Finally the following tips and tricks regarding the three phases of the research were added in the introduction:

1. Making contact with the participant, as this first step often determines how the rest of the conversation will turn out and it is a step people often seem to fear. Some minor suggestions seemed to help people step over a perceived threshold.
2. How can you improve the results of the research? Containing tips about interviewing, attitude and letting participants think out loud.
3. How can you write down results and conclusions in a way they would remain clear, rich and alive for the original research team who needs to interpret them? , Containing tips on what and how to write down quotes and stories..

The research part of the booklet was built up from 7 sections, providing a red line for the conversation with the crew. These 7 sections were based on conversations about and results from previous findings, each containing an 'A or B' question, extended by a 'why' question. The last five sections had a third question as well, asking how the current situation could be improved? This structure of questioning, from close to open, allowed people from different cultures to answer.

This co-creation with the remote co-researchers of the research kit proved to be very useful and resulted in a different appearance of the working kit and focused on different aspects of the previously identified directions as well.

2.5 Enrichment session

A final session was organized to make the data, found via the remote co-researchers, more illustrative. In this session 4 Dutch crewmembers were invited to talk about the previously uncovered experiences. Before the session, they were prepared, using a sensitizing booklet (Sleeswijk Visser et al., 2005) with questions about their workday, focusing on care and attention. The session resulted in lively quotes that did not need to get transferred via a remote co-researcher.

2.6 Final design

The research resulted in three themes: Control, Closing off and Care, accompanied by quotes to retain a connection with the context and later converted to a storyboard. The final design incorporates most of the results into one concept and is called Safehaven. The crew rest cabin is split up into three areas to guide the transition from and to work: the entrance, the hallway and the individual bunk. The entrance is designed to act as a border between work and rest. The hallway completes the metamorphosis as it facilitates changing clothes, washing up etc. Work clothes are then hoisted up (to the more work related level of the crew) and left behind, as a metaphor for leaving work behind. To get even further away from work, another border is set up in the shape of the bunk-hatch, creating a 'matrushka doll' of borders.

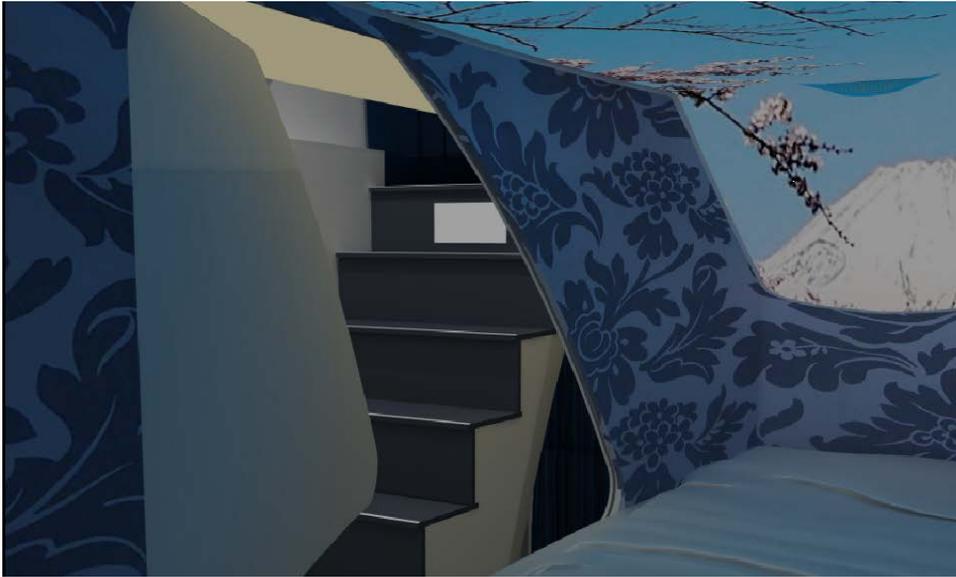


Figure 2 Artist impression of the hallway seen from inside a bunk-bed.

3 Results and discussion

In this project we decided to work with remote co-researchers as a solution for the contextual design research in a remote and global situation. The question is, what the value of this approach is in this specific situation.

- Is it effective and efficient to work with remote co-researchers if so when?
- Which factors do design researchers have to take into account when incorporating remote co-researchers in their project?
- What are barriers and limitations for the use of remote co-researchers in design research projects?

3.1 Reliability of data

A weak part of the research is that the data travels between multiple people, influencing the reliability of the insights by the interpretation of data by each person involved. Questions are transferred via the remote co-researcher to the participant and answers travel back from the participant to the remote co-researcher, who makes a translation, writes them down and passes these notes on to the original researcher, see figure 3.

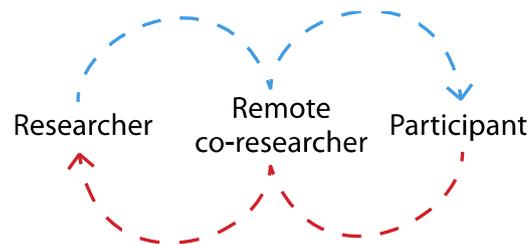


Figure 3 Information travels from researcher via remote co-researcher to participant(s) and is returned via the remote co-researcher as well.

Explaining what we were looking for helped to create ‘goggles’ (a way of looking) for the remote co-researcher to approach the research with. It is impossible to look through exactly the same goggles as the remote co-researcher, making interpretation of the results hard. Therefore, it is important to do the interpreting together with the remote co-researcher, talking about the results and their meaning. **Iteration:** These discussions are also needed to improve the research kit for other remote co-research users. An iterative process, which means a constantly improvement related to both the research kit and the design, seems to be unavoidable. **Time:** The time needs extra attention since the researcher relies highly on the availability of remote co-researcher’s time-schedule. Therefore, plans should be made in an early stage, taking into account throughput time and flexibility for adjustments. **Selection of remote co-researchers:** A limitation of the research, due to time pressure, was that all remote co-researchers were Dutch and the number and variety of participants (gender, role as a crew member, nationality and airline) was low. However, involving end-users (crew members) in the process of designing and doing the research proved to be extra useful as it helps end-users to look at their work in a different way. By acting as a researcher they look at their own work through a different perspective, boosting their level of ‘understanding’. providing deeper insights on their own experience as well.

3.2 Depth of insights

The outcomes communicated via the booklets widened the scope of the research as was intended and the results proved to be inspiring as well, but they did not yield many deep insights. So enriching the data with a session is advised. However, there is room for the improvement of the quality of the booklets and

returned insights. For instance, it helped to explain more comprehensively how results could be written down. In the later stages of this research, the researcher showed the remote co-researchers how the research could be done, by acting it out. In this play the researcher focused on tone of voice, and getting participants to tell more without putting words in their mouth. On top of that discussing the results should be done with every returned kit. It increases the workload for the remote co-researchers, but will increase the level of insights even more. **Trust:** When the researcher needs to bridge a cultural gap between him/herself and the participant(s), extra attention should be paid to create trust between both parties (van Rijn, 2005; van Boeijen, 2011). The strict security rules within airline-cultures increased this need to build up trust. Giving clear and high quality background information about the remote co-researcher him/herself and the research project created this. **Global context:** Some participants of a specific crew seemed to be more willing to accept hierarchy than others (which was in line with the higher score on the cultural dimension 'power distance'). Participants of another crew were expressing their preferences for individual freedom, which means that they emphasized the desire for personal preferences (which was in line with the higher score on the cultural dimension 'individualism'), while other crewmembers were more willing to adjust to the current situation. Some members of a specific crew expressed their desire to have privacy for changing clothes (which was in line with the higher score on the cultural dimension 'masculinity'). The designer (first author) assumes that designing for 'lower power distance', 'higher individuality' and 'higher indulgence' will finally serve all cultures. Extra attention is given to the need for privacy when changing clothes.

4 Conclusion

This paper started with the central question; how to do contextual research in a remote and global context, with the aim to design a global product service system that serves people from different cultures (nationally and professionally). The remote co-research approach was chosen as a solution to gain insights of the 'difficult to reach intended-users' (crew members). It helps end-users to look at their work in a different way, making them not only useful as co-researchers but as super participants as well. This kind of research seems promising but has its limitations as mentioned in the discussion. Nevertheless, we think that remote co-

research is a valuable addition to design research in design projects where intended users and the context of use is difficult to reach. Therefore, it is worth further experimentation.

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Using employee insights in fine-tuning the customer experience

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Abstract

For companies it is important to create positive customer experiences. This paper suggests one customer-sensitive way to get information to improve the customer experience. This is done by conducting non-managerial employee walkthrough audits with those employees who take care of the service processes and the facilities in daily manner. The assumption is that those employees have first-hand understanding of the customers and their experiences. The method is tested by conducting walk-through audits in in two Finnish wellness centers. The staff members were interviewed while they were walking around in the service provider's premises. Additionally in the other site there was a managerial workshop to gain the management view on the customer experience. The walk-through audits gave several suggestions for actions to improve the customer experience and they were seen as a powerful way to understand the customer experience. On the other hand it was acknowledged that the employee understanding of the customer is limited and there are spaces and processes in the wellness centers where the employees rarely go. Thus relying solely on employee understanding in fine-tuning the customer experience would be limited and would not cover all aspects of the customer experience.

KEYWORDS: customer experience, service processes, spatial processes

1 Introduction

Managing the customer experiences has been quite a central topic in business research lately (see, for example Mascarenhas, & al. 2006; LaSalle & Britton 2003; Pine & Gilmore 1999). The focus has been on moving from products, services and processes towards the customers and their experiences.

For some businesses the customer experience is their core business. Their customers use their products and services in order to gain experiences. Hotels, amusement parks, concert halls and vacation destinations are examples of such businesses (see, for example, Heath & Wall 1992; Rasila, 2010). We can say that these businesses are in the business of marketing experiences.

This research is interested in one such service where creating favourable customer experiences are the core business. This business is offering wellness services for individuals and companies. Such wellness services include, among others, day-spa services, spa activities and exercising. In the context of this study these services are provided by wellness centres where most customers stay overnight.

The customers are important sources of information when creating improved customer experiences. This approach is not entirely unproblematic. It is quite easy to get the customer involved through feedback systems, polls, surveys or short interviews. The information gained through these “resource-efficient” methods is always somewhat limited and it does not necessarily offer in-depth understanding of the customer experience. On the other hand involving larger number of customers to processes that consume more time and other resources is not either a good option.

One alternative is to work with those individuals who interact with the customers in their daily activities. Assumedly working with the customers gives the employees some understanding of the potential to enhance the customer experience. This paper studies if it possible to gain understanding for improving the customer experience through the employees. Further, the aim is to understand what kind of information may be retrieved from the employees.

The ability to use employees as a source to develop customer experiences is tested in case study setting. The cases included two Finnish wellness centres. Both are in the business of creating experiences for their customers and the information was gathered with walkthrough audit and future oriented workshop.

The user journey approach is used to structure the findings. User journey and related mapping methods are much used ways of illustrating the customer experience. The paper starts with an introduction to the user journey. Then the methodologies and case study setting are introduced. After this the results of the empirical part of this paper are presented. The concluding section suggests some ways for further research and looks critically at the findings of this study.

2 Theoretical background

The service in many lines of business is carried out in the premises of the service provider. In this case the space and the service processes are closely interrelated. Walk-through audits have been used to understanding the customer experience that is linked to both the space and the service processes (see Fitzsimmons and Fitzsimmons 1994; Fitzsimmons and Maurer 1991). These audits may be referred to as Service Process Audits (SPA) as suggested by Rasila & al. (2010)

A basic method to understand and describe service processes is service blueprinting. The method was created by Shostack already in 1984. In the service blueprint, the service processes and interactions are visualized as a flowchart (see for example Koljonen and Reid 2000). This approach has some disadvantages; first, it typically looks at the processes from the company rather than a customer perspective. Second, the blueprint illustrates only the observable actions or events (Kingman-Brundage 1989).

Other methods for analysing service processes are service mapping (Kingman-Brundage 1991; Gummesson 1993; Gummesson and Kingman-Brundage 1992) and the sequential incident technique (SIT) (Stauss 1993; Stauss and Weinlich 1995). The first is, as service blueprinting, more company focused, whereas SIT is more customer focused (Johnston 1999).

The sequential incident technique draws from the critical incident technique (CIT) in which the customer is asked to describe those moments in the service process that were in some respect exceptional – either in good or in bad. The data is then classified into different types of experiences with content analysis. (Bitner and al. 1990) For our purposes the approach has two limitations; first the process dimension is not clear, and second, the normal incidents are excluded from the analysis.

The sequential incident technique bypasses these problems and thus it is used as the framework for this study. The technique looks at entire processes and includes also those incidents that are not exceptional. As Stauss and Weinlich (1997) state: “The fundamental purpose of the method is to record all incidents customers perceive in a specific service transaction sequentially in the course of the consumption process.”

The first step is to construct a “customer path diagram” (compare with blueprinting). This diagram shows the typical path a customer follows when he is involved in some service process. Suggested methods for data gathering are single interviews, group interviews, surveys and observation. The aim is to understand what customers typically do during the service process. (Stauss and Weinlich 1995) In the context of this study we can speak of “customer journey” or “user journey”. (Alho and al. 2008).

When the customer path or user journey is understood, SIT moves on to the second phase – namely assessing the customer experience during this path. This is done with interviews or surveys. After all the data have been collected, they may then be analysed. If a survey is conducted, then statistical methods are applicable. If the customer experience is studied by interviews, more qualitative methods are applicable. (Stauss and Weinlich 1995)

3 Case study setting and methodology

A typical wellness center is a complex of accommodation facilities, exercise and therapy facilities, swimming pools, and restaurants. There are some 20 such institutions in Finland and these may be found from all over the country. In addition to self-paying individual customers and company visitors having meetings in the wellness centers there are also at least some degree of rehabilitation services available. The two cases in this paper are big actors in this business and the companies are more oriented to self-paying customers than doing publicly funded rehabilitation.

In both companies a walkthrough audit was carried out with representatives from different professions. There were participants from the restaurant, the reception, the accommodations, wellness services and rehabilitation. It was asked that the

managerial representatives were not present in the audit so that the employees could speak in a free and relaxed atmosphere.

The group consisting of the occupational groups mentioned above was interviewed while they were walking around in the premises. The route was selected by the participants and the advice was to bring the researcher to places the personnel wanted to show them. The interview was recorded and photographs were taken during the trip.

On the second wellness center there was also a participatory workshop to discuss the future of the company and its premises. Also this workshop was recorded. The participants were middle managers in contrast to the non-managerial representatives of the walk-through audits.

This paper draws from the techniques presented in previous section and tests if these could be applied to understand the customer experience through the eyes of the employees that take care of the service process and the premises. In the next section the findings are presented in a customer journey steps.

4 Findings

The customer journey or customer diagram path was divided into seven steps. These were:

1. **Orientation.** What the customer does and thinks before leaving for the wellness center. This includes deciding to go, choosing among service provider, finding ways to go to the wellness center etc.
2. **Arrival.** The arrival to the wellness center either by foot, bike, car or public transportation. This phase ends when the customer leaves the reception to go to activities or to accommodation facilities.
3. **Moving around.** Going from place to place to carry out different activities in the premises.
4. **Accommodation.** Going into the hotel room and using it.
5. **Wellness processes.** These processes involve typically group or individual contact with the wellness center professionals. These services include, among

others, massage, make up, gym, outdoor activities, lectures and group sports (such as aerobics or playing football).

6. **Eating.** The places to eat include restaurants (both buffet and ala carte), cafes and bars.
7. **Exit.** This includes leaving the premises and getting back home. Also the marketing activities after leaving the premises are part of exit.

First step was the *orientation* and the employees noted that the customer experience begins before the first visit to the wellness center. Thus more attention should be paid on the orientation phase of the customer journey. Especially the internet and social media could be used much better.

One role of the internet is on marketing the services. Another role of the internet is linked to the preparations done before the arrival at the wellness center. Thus information such as “how to get there” and “what things I need to take with me” is important first steps in the formation of the customer experience. Additionally people want to know in advance what services they may purchase from the wellness center and what happenings will take place during their visit. Thus the internet plays an important role in formation of expectations before the actual visit.

The *arrival* phase gives the first impression about the physical premises of the company. The reception areas of wellness centers are much like those of hotels. There is a reception desk and typically a cafeteria nearby. The employees saw that the lobby should give a personal, dynamic and relaxed impression of the entire wellness center. In this respect the interviewees saw that their companies had done well – both companies had invested heavily on creating good first impression in the reception area.

One thing that was lacking was that the services and happenings were not visible in the reception areas. One suggestion was that there should be virtual boards which would allow you to scan through the available treatments and activities. The customers get the hotel like impression, but element of taking care of yourself was not visible in the lobby – even though this care is the main reason to come to the wellness center.

Moving around in the premises is a great challenge in creating the total customer experience. The wellness centers are huge complexes and visitors have sometimes difficulties in learning to move around in the premises. This is sometimes really irritating, and the customers complain the employees about their problem of finding their way. This may affect the total customer experience negatively. Thus, it could be productive to give

more importance to guiding visitors around. This could be done for example by adding more visible signage.

Further, the interviewees told that sometimes the customers feel awkward when they are moving around in the premises in their bathing ropes or t-shirts and shorts while they have to by-pass the group of company visitors in black suits. Thus figuring out a way to direct the movement of different customer groups should be considered so that individuals in different context do not meet in an awkward way.

The first move in the premises is either to participate in a wellness process, business meetings or *accommodation*. The hotel rooms of the wellness centers are just like any other hotel rooms and they are supposed to be a comfortable experience for the customers. Customers seldom have negative feedback to give about the accommodation. Apart from cleaning department and facilities management, the personnel of wellness centers quite rarely go to the customers' rooms so their understanding of this side of the experience was perceived to be limited.

Some customers buy *wellness processes* in advance before coming to the rehabilitation center. Then there are additional services that may be purchased on site. Typically using the pool area and the saunas is free for those staying overnight. For creating customer experiences it is important to create wellness areas that have the same atmosphere that the services in question. For example, the day spa areas need to be relaxing and restorative whereas the sport facilities should be dynamic in nature.

During the visit to the wellness center the wellness services are those moments that the customers and employees are interacting most and for longer time periods. Thus in this setting the space, service process and the personality of the employee giving the treatment is affecting the customer experience especially lot.

More attention should be paid to educate those persons who interact with the customer lot during their service delivery processes. For example hairdresser can be a great source of information to customers but many times they are outsourced service providers who have little information about the other activities in the wellness center. They have the possibility to enhance the customer experience, but no means to do that.

Both case wellness centers had paid a lot of attention to the *restaurants and cafes* so that they would maximize the customer experience. There were special attention paid to the interior design and also the quality of food. In addition to the waitresses the other employees in the wellness centers had little to do with the customers while they were

eating. The customer feedback they had heard during their own duties was positive in nature.

Again in the restaurant the different customer groups at the same tables were understood as a problem affecting customer experience negatively. Thus the business man in black suit and his client eating in a sweat suit on his way to jogging were both feeling uncomfortable. The employees commented that sometimes the customers did not know the dress code to the restaurant and they might have just casual outfits with them – thus they were not able to change for the dinner or the lunch while other visitors had their best evening clothes with them.

After the time in the wellness center there is the time to *exit* the premises. From employee perspective this was quite a neutral procedure and quite familiar as it resembled so much ordinary hotel visit. For the customer experience leaving tends to be less distressing than arriving as the problems of *how I get there* and *where can I park my car* are not present. Still, the exit is a phase of the customer journey where there is a great potential to affect the customer experience positively as the customers are not used to expect that.

In both wellness centers there is a café in the vicinity of the reception desk. Thus it is possible to make the exit more enjoyable by sitting for a cup of coffee before leaving the premises. This was perceived to be a good solution. The employees wondered how they could affect the customers after their departure so that they might return to the same wellness center again.

5 Conclusions and discussion

The employees doing work at service provider's premises are one great source for information about how to improve the customer experience. They interact with the customers in daily basis and it is possible to get customer information from them without bothering the customers.

The understanding of employees is efficient as it has cumulated from experiences from many customers. Thus in a way one experienced employee may speak for big group of customers whereas individual customer may speak for himself only. Further, the employees have a longer perspective on issues than the customers who spent shorter periods in the premises.

Still, there are parts of the customer journey where the employees are not present in any way. Thus getting customer information from employees in this setting is

difficult or impossible. Thus the customer information from the employees is not enough without additional understanding from the customers themselves.

In the two case wellness centers walkthrough audits with different employee groups were carried out. The biggest room for improvement appeared to be in the phase when the customer has not yet entered the premises. In this phase it is possible to affect the expectations of the customers and offer him new experiences even before entering the premises. Keeping up with the customer relationship after the visit is a challenge that would probably affect the customer experience positively.

The difference of wellness center and a hotel is in the wellness services available. To enhance the customer experience the services and happenings available for the customer should be made much more visible not only before the visit but also during it. The reception area, the hotel rooms and corridors and elevators could be used much more effectively to pursue the wellness aspect of the companies. This would enhance the customer experience and bring new business for the wellness service sector of the wellness centers.

Another central need for change is to think about the roles of customers in different roles. Customer having a business meeting and a customer having an aerobics lesson have totally different roles. When these roles meet, there is confusion that could be avoided by rethinking the processes and spatial arrangements in a way that people in different roles do not meet in an awkward manner. The summary of suggestions for improvement is presented in *Table 1*.

Table 1: Some suggestions for improving the customer experience.

| | |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Orientation | Using social media and internet in the marketing more effectively; informing the customer about things such as “how to get there?”, “what services I might use during my stay?”, “what I need to take with me?” |
| Arrival | Marketing the services in the reception. |
| Moving around | Better signage or other ways to navigate in the premises, different paths for different customer groups. |

| | |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accommodation | No suggestions as the participants were not with the customer in the accommodation facilities. |
| Wellness processes | Different activities need different “moods” in spatial solutions; personnel providing wellness services is an important channel for marketing the services and the wellness center if educated to do so. |
| Eating | Clear dress codes; balancing the dining of different customer groups. |
| Exit | Good mood in exit – for example a moment in the cafeteria; better marketing activities after departure |

This study has been limited to two cases and the findings are more practical than theoretical. This is a severe limitation of this study. Still, this paper works as an initial open for more academic discussion on the topic. Next step in the process will be to map the customer experience from the customer perspective and see how well the customer experience and employee understanding of it will fit.

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A Laboratory Concept for Service Prototyping – Service Innovation Corner (SINCO)

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Abstract

This paper outlines a new holistic approach to service prototyping, which supports different phases of the service design process. SINCO is a laboratory concept consisting of the environment and set of tools suitable for service prototyping. It can be conceptualized under the following five terms: Servicescape Simulation; Service Stage; Digital Touchpoint Toolkit; Rough Mock-up Crafting; and Teamwork & Documentation Tools. In SINCO, it is possible to study and analyze existing service journeys, visualize ideas and develop them quickly and evaluate concepts collaboratively. The technologies used in SINCO help studying service situations with quick simulations, reveal technological development opportunities through experimentation and enable setting-up of the desired service paths as substantial experience prototypes for testing and communicating.

KEYWORDS: service prototyping, service design, agile technologies, prototyping laboratory, co-creation platforms, action research

Introduction

The goal of this article is to look at service prototyping in different phases of the service design process and explain how service prototyping can help in gaining customer understanding and ideating or evaluating service concepts. Research data have been collected during the Service Innovation Corner (SINCO) project, the main goal of which was to build a prototyping lab for service and interaction design at the University of Lapland. The starting point of the development of SINCO was the analogy of product mock-up crafting and workshop culture in industrial design.

Service design is one of the strategic research areas at the University of Lapland. The Faculty of Art and Design has worked for several years with service design and service prototyping methodology. Our research and development (R&D) work on service prototyping falls mainly into two different areas. The first considers how service prototyping can add value at various phases of the service design process and the second focuses on the agile use of technologies to prototype customer journeys, service moments and different touchpoints quickly and iteratively. The use of existing technological solutions with mock-ups enables rapid visualization, concretization and evaluation of ideas.

The findings presented in this paper are based on the action research conducted along with the development process of the SINCO laboratory and pilot projects with nine companies and public organizations. The essential feature of action research is testing ideas in practice as a means of increasing knowledge about or improving the target issue (Kemmis & McTaggart, 1988). In our case, the initial issue was how to enable a prototyping workshop-based working culture in service design with a new laboratory concept. The action research process is cyclical, typically comprising the following steps: identifying the problem; gathering data; design; performing the actions; analyzing and reflecting on the results; capturing the knowledge; and planning the next steps (Ferrance, 2000; Waddell, 2007). Research data for this paper also include three documented service prototyping case studies with different companies: Lapin Kansa (regional daily newspaper producer); LAPPSET Group (playground equipment manufacturer and supplier); and KL-Kopio (digital printing company). The cases were realized in the SINCO laboratory as student projects. They were analyzed both by looking at design research methods used in each phase of service design process and by analyzing technical methods used for service prototyping in each process phase.

Our experience of working in the SINCO laboratory and the findings of this paper partly coincide with some of the challenges identified in recent research on service prototyping practices (see, for example, Blomkvist & Holmlid, 2010). Many studies (for example, Holmlid & Evenson, 2007) have articulated the need for a new shared language of prototyping, a way of communicating the value of service prototyping to service providers and an understanding of how existing design and prototyping methods can be used to prototype services. Blomkvist and Holmlid (2010) also point out the need for a holistic approach to prototyping, including new processes for studying servicescape's influence on new service concepts.

Overview of service design process and prototyping

Service design connects the areas of cultural, social and personal interaction. Use of different design methods, design research, design thinking and different visualization techniques link different stakeholder views during service development process. Conceptual and iterative design are important elements of service design process. Oosterom (2009) proposes a five-phase service design process that includes discovering; concepting, 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 the variety of different process models can be found in the service design literature and on companies' websites (Engine, 2009; Mager, 2009; Oosterom, 2009; Moritz, 2005).

The different process models vary according to the accuracy and the number of the phases. The identification and discovery phase is about understanding the service context and the

user's requirements, as well as the business environment of the client. The building, concepting 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 are valuable to customers. The implementation phase, incorporating the IT process, development and training, is also often included in the process (Mager, 2009; Oosterom, 2009).

Processes and methods should be selected and applied according to each case or project. Nevertheless, the important factors that must be considered when developing and applying service design processes can be identified as follows:

- » understanding the service design challenge: the users, business environment and applicable technologies;
- » observing, profiling, creating empathy for and co-operating with the users;
- » including the clients, other stakeholders and the users in the process;
- » creating ideas; prototyping; evaluating; improving; and visualizing during the whole process;
- » implementing the services, and also maintaining and developing the services after implementation.

For SINCO projects, we have simplified the service design process to the main steps needed to co-operate with the client company. The steps are called: Find; Create; Concretize; and Make it happen. In an academic context, the last phase is often reduced to guidelines and instructions about how you should make it happen. Throughout the SINCO process, prototyping is used as a central platform for agile development of novel or existing services.

The main purpose of prototyping is to concretize an idea (Fulton Suri, 2008). A prototype can quickly and inexpensively communicate a service proposition and prompt questions on technical feasibility, consumer desirability, and business viability (Samalionis, 2009). Prototypes should represent product, technological and social interactions (Kurvinen, 2007). Ideas and concepts can be shared in various ways, as prototypes from very early to late in the process, in order to learn from other people's reactions and to check, revise and refine assumptions (Fulton Suri, 2008). In the beginning of the service design process service prototypes can help in understanding and defining the design problems to be solved. In the concepting phase, prototypes help to evaluate whether the service is useful and usable for the customer and effective and efficient for the service provider.

Service designers find service prototyping central to their work because it is collaborative, makes services visible and helps to communicate service concepts (Blomkvist, 2011). Prototyping enables collaborative work with stakeholders when designing product service systems and multi-channel services (Vaahtojärvi, 2011). Service prototyping is testing an overall feel of design. Penin and Tonkinwise (2009) have studied the role of theater in service design and their studies indicate that the use of theater in designing is most common in relation to prototype testing. As designers are concerned about the quality of their designs, they want to test the awkwardness or ease of use of the concepts in an appropriate setting, which might be a staged setting, such as a studio or laboratory, or in natural surroundings.

Blomkvist and Holmlid (2011) propose that the rapid prototyping approach sometimes means that prototyping is an activity ongoing throughout the design process. Then, the character of service prototypes changes with time by becoming increasingly elaborate and detailed. Also, piloting can be seen as one form of prototyping (Vaahtojärvi, 2011). When comparing rapidness of service prototyping to rapid prototyping in industrial design, the "rapidness" of prototyping is related to the advantages it gains in speed, accuracy and complexity over other prototyping methods. In the manufacturing industry, rapidness is

compared to hand-made prototypes on the one hand and first versions manufactured with actual production tools on the other. In the same way, rapidness in service prototyping is relative to the purpose of the prototype to be built; is it to be built for early experimentation and learning, testing and proofing, communication and interaction, synthesis and integration, or for scheduling and marketing. (Chua, et al., 2003.)

Considering the recently acquired knowledge and state-of-the-art practices surrounding service prototyping, our research has focused on developing new technology-assisted methods to prototype customer journeys, service moments and different touchpoints quickly and iteratively. The SINCO prototyping laboratory concept introduced in the next chapter is an attempt to facilitate experience prototyping with technologies as well as innovative working principles including “quick and dirty” prototyping, “thinking with hands” and “serious play” (Kelley, 2001; Brown, 2008).

SINCO: a laboratory concept for hands-on service prototyping

SINCO is a laboratory concept consisting of the environment and set of tools suitable for service prototyping and interaction design. 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 service ideas.

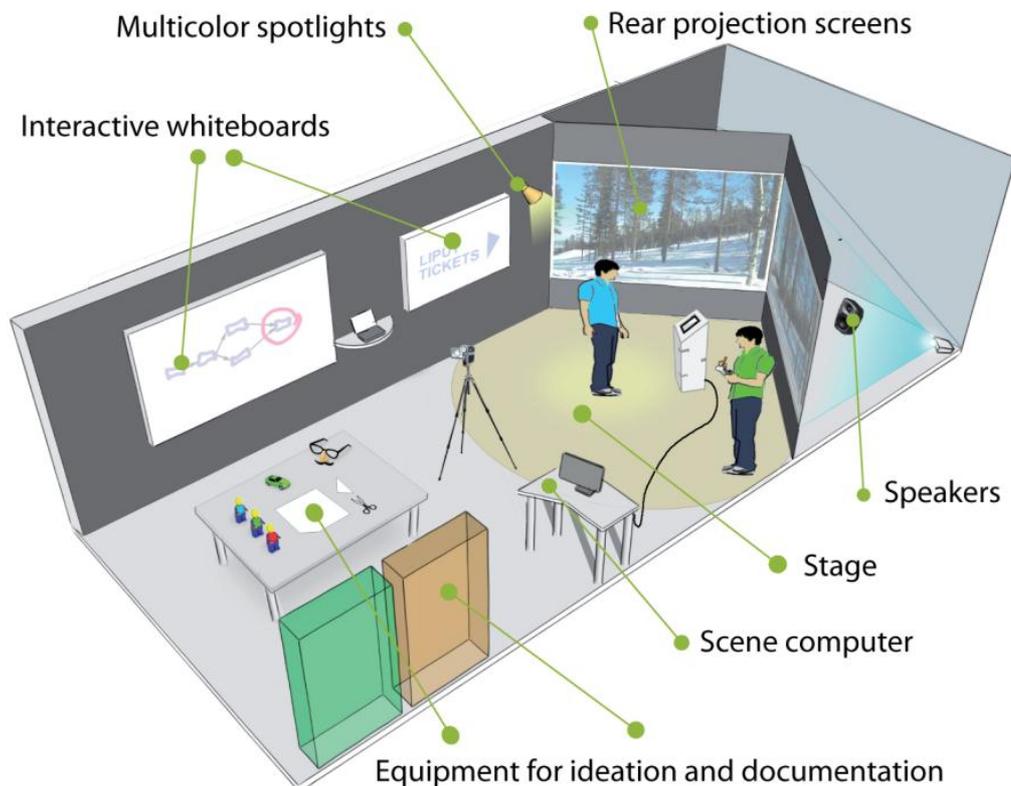


Figure 1 Overview of SINCO service prototyping laboratory

Technology used in service prototyping at SINCO includes: interactive whiteboards (for notes, sketching and user interface prototyping); props and building blocks (used in role-play and rough modeling of physical environments); a scene computer (for controlling service

scene backgrounds and service journey); rear projection displays (for quick creation of service scene backgrounds); multi-color spotlights and loudspeakers (for creating the desired atmosphere at service scene); craft equipment (for mock-ups and other tools for creative hands-on building); and user interface (UI) devices (for producing interaction design mock-ups and visual touchpoints).

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

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 (see Figure 2). 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 rapid service prototyping.

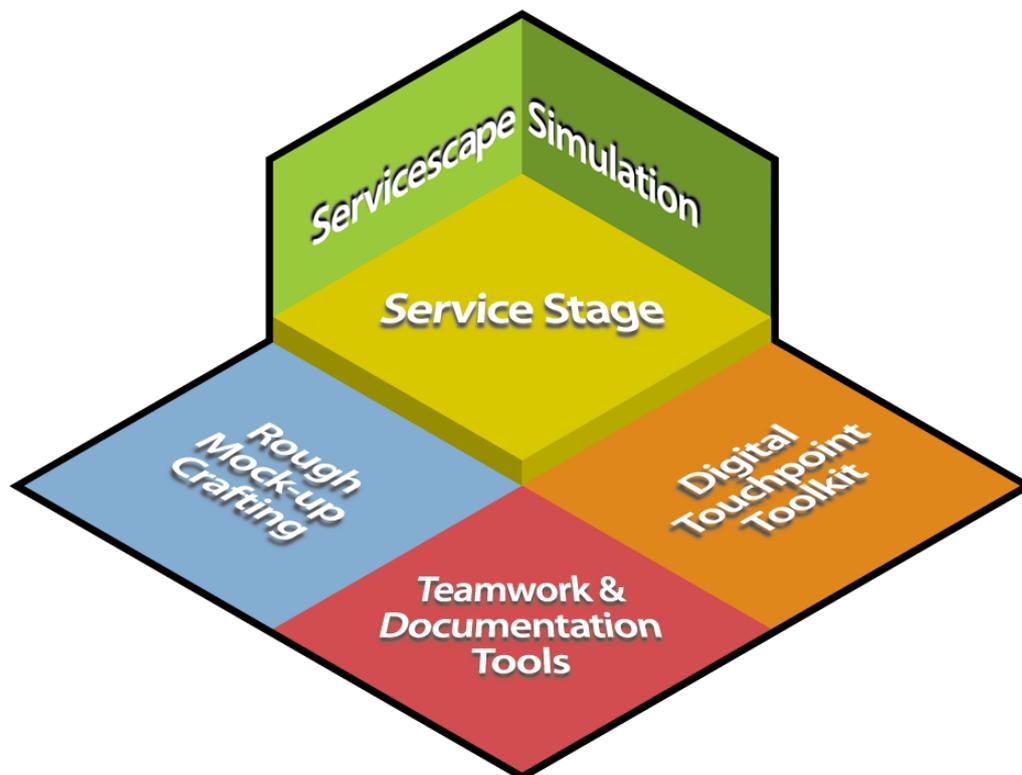


Figure 2 Key elements of SINCO service prototyping laboratory

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 service moment can be brought to the service prototyping in a matter of minutes and saved for later sessions. A sequence of servicescapes can be used as an experiential script by which customer journeys may be prototyped.

Different means for simulation are used and developed in the context of service design. Makino et al. (2009) have noticed that an interactive process where visualized simulation

results are shown to the field experts repetitively enhances rapid prototyping and obtaining valuable feedbacks from them in the case of using service design tools to improve airport service processes though these simulations were computer based. Their finding supports the use of simulation in the case of SINCO. Pillan (2011) uses the term FASPE (Fast Service Prototyping and Simulation for Evaluation) in this simulation type paper prototyping and drama methods are used in the context of service design.

As the set-up for servicescape simulation, we ended up using two 117” background projection screens perpendicular to each other, in order to provide the background scenery and enable partial, yet immersive spatiality. One loudspeaker was placed behind each screen to provide sounds that seemed to emanate from the landscape. Multi-color spotlights help create the desired ambience (“blue dusk”).

While the imagery view created the majority of the simulation, we had found sounds—even simple, suggestive, looping ones—relevant to immerse the actor at the service moment. PowerPoint™ (or similar software) with a dual display adaptor is used to control background images, videos, sounds, and transitions, which, at the same time, build an entire service path.

PowerPoint™ also enables authentic stimulation of the actor; for instance, a queue number change presented as a blinking image and a sound clip for the prototyping customer sitting in a waiting room. The presentation also works as a platform for generating ideas and designing touchpoints related to the servicescapes of the customer journey. Content material for the simulation is quickly found, either on the Internet (Google Street View and image search, Internet sound libraries, etc.), or taken as photos or videos at the actual servicescapes as relevant.

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 servicescape simulation or take the role of another user. We found a service stage with role accessories and prop building blocks to be an encouraging area, even for persons with no prior experience of role-playing. Cubic furniture, for example, works as versatile building blocks for creating suggestive, but functional props, whether they represent a service desk, a ticket port or bus seats.

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 the concrete spatial elements and interactions needed for prototyping the service. Rough and unfinished tangible mock-up elements, used case by case, support the idea of the service stage as an informal place, where playing out wild ideas 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 video or existing user interface on the Internet, can be quickly composed on the servicescape simulation or presented separately among the tangible sets on the stage.

Digital Touchpoint Toolkit

The Digital Touchpoint Toolkit is a set of handheld devices used to prototype ideas with digital content. The Toolkit includes differently sized mini video projectors; small speakers; mobile devices such as 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. In 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. Also, various alternative touchpoint designs can quickly be presented digitally within the entire service prototype. For example, in an interior-design-focused service design project, a sequence of different tablecloth designs was projected onto the table surface while the test users were evaluating the effect of each on the dining experience.

In the later phases of the design process, the Toolkit is used to achieve higher fidelity of prototype for user testing and to decrease the need for intervention by the design team, which helps prototyping interactions. The early sketches of a user interface can be paper-prototyped remotely at the desk while it is simultaneously captured with a document camera and shown on the screen of the user’s mobile device. In later iteration cycles and for communicating the design solutions to the client, interactive user interfaces can be prepared without programming skills with PowerPoint™ and tested as an interactive presentation on a mobile device.

Rough Mock-up Crafting

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 role of both the people and the things involved in services (Burns, et al., 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 from 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.

Teamwork and Documentation Tools

Service design and service prototyping alike 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. 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.

The majority of the documentation tools are digital, in order to encourage the teams to do as much as possible of the documentation in a digital format. Digital documentation is optimal for storing, editing, sharing and analyzing the documented materials. These tools include interactive whiteboards and several kinds of video and still cameras. Alongside the digital documentation formats, a lot of the documented material is still in physical form, such as paper, cardboard and foam objects that have been developed from ideation and documentation. Therefore, SINCO has a storage system, where all the separate projects have dedicated space to keep their unfinished materials safe between team-work sessions.

SINCO prototyping in action: three case studies

Another focus area in our research on service prototyping is the development of SINCO's agile and innovative operating culture in an academic context to serve design teams, companies and their stakeholders. For us, the term SINCO refers not only to the prototyping laboratory at the University of Lapland, but also a new holistic approach to service prototyping, as well as a new working culture in designing services, which supports different phases of the service design process. The SINCO laboratory has worked with several companies and public organizations, focusing on developing and prototyping new solutions for their services, user interfaces and overall product experience. In SINCO, it is possible to study and analyze existing service journeys, visualize ideas and develop them quickly and evaluate concepts collaboratively with companies, design students, teachers, researchers and end-customers.

In SINCO, prototyping usually starts by studying the current state of the service. During this phase, the project group will do research into the current service environment, competitors and the company's operational environment, as well as getting to know the service process from the customer's point of view. In the beginning of the prototyping process, generative work, producing lots of ideas with prototyping methods, can help the client to form the brief and understand the value of service design. The simple tasks of creating empathy and looking at the user's service journey are core elements of the work of the SINCO laboratory.

Ideas for new service processes, situations or details are represented firstly through visualizations, small-scale mock-ups and rough prototypes, which are developed in cycles. The short duration of a prototype cycle, between trying something out and testing it with users, is what makes the relationship between design and business successful (Moggridge, 2006). In SINCO, to build a prototype is inexpensive and testing it is collaborative and eye-opening.

The purpose of prototyping is to see, hear and feel the future service situations as realistically and tangibly as it is possible to do. By testing and acting out a prototype of a service, the project group can come up with new solutions, test new interactions and make ad hoc innovations. Based on the experiences of prototyping in SINCO, the most promising service prototype will be refined and further developed into a finalized holistic service concept.

In SINCO, prototyping is iterative, concrete, agile and co-creative. The SINCO process as a whole enables the communication, testing and further developing of optional services, before launching them. One of the important focuses of the SINCO laboratory is to work as a learning environment, where students work alongside the project team, researchers and

companies. Knowledge transfer from the service design team (researchers and students) to knowledge recipients (partner companies) occurs in the context of co-creation. Students have hands-on involvement in the cases, learning to use both different prototyping methods and technology that facilitates prototyping.

Studying customer insight with prototyping: Lapin Kansa

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 a grocery store. At the beginning, the customer journey of a store was photographed and illustrated as 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, what could be the concrete thing to be sold, how to register the customer information with as few steps as possible and how to instruct a new customer in registering.



Figure 3 Prototyping the customer journey of a grocery store simulated at SINCO

Experience prototyping with servicescape simulation was used throughout the process, including understanding the use context, composing new ideas, and testing the final concepts and communicating them to the company representative. In concept test sessions, the thinking aloud method was used to capture the intuitive reactions, attitudes, goals and needs of the test users. The findings were also substantiated with concept testing and observations at the actual grocery store.

The case concretized the difference between empathizing with someone else's role and experience prototyping intuitively for oneself. For example, for a team member already subscribing to the newspaper, it was easier to test the attractiveness of the concept than for a non-subscriber. In the meetings with the company, we found it beneficial to give the company representative a role in acting out the new service concept. This deepened their insight into the new idea and its user experience. The case at the same time highlighted the challenge of experiencing prototyping larger spaces in a laboratory. When experimenting potential spots for the sales stand at the store, using the servicescape simulation alone meant it was a challenge to perceive the layout of the entire store. Even though this was a minor point in terms of the goal and the results of the project, it led us to formulate new ideas in the ongoing development of SINCO methods.

Service concepting through prototyping: LAPPSET Group

In the project for LAPPSET Group (a Finnish global playground equipment manufacturer), a student group conceptualized virtual trainer content for public outdoor spaces. The aim of the project was to create a digital service concept for physical products to bring competitive

advantage in the fitness equipment market. The initial design brief included generating ideas that activate users to exercise, utilizing touchscreens connected to gym devices.



Figure 4 Prototyping screen-based virtual trainer for LAPPSET Group

The design process followed the cyclical model, repeating divergent and convergent working phases based on continuous hands-on prototyping. The overall solution containing the layout of physical gym equipment and the screen were initially figured out with toy building bricks and adhesive paper-note walls. A central part of understanding the experience, especially as related to exercising and communicating ideas in the early phases was acting out user scenarios on the service scene with relevant servicescape simulation and application mock-ups.

Different devices and Internet resources were utilized to concretize, understand and develop various ideas. For instance, the Sony Eye-Toy™ game was used as an exemplar to understand motion-tracking-based user interface experiences and possibilities. A remote guided training program was prototyped with camera and a screen with online capturing application, while one design student acted for the camera and the others exercised on the service stage in front of a simulated park environment. The experience of prototyping helped develop understanding of video conferencing technology possibilities, their constraints and the socio-emotional aspects that could not be tested by paper prototyping or mere role-playing.

During the LAPPSET Group project requirements for the Digital Touchpoint Toolkit were gathered because the SINCO environment was still under development. When reviewing the prototyping process, the student team with an industrial design background wanted more easy-to-use tools for making rapid user interface mock-ups, as well as more versatile tools for creating different physical interactions, for instance with the aid of simple motion detectors.

Evaluation phase and prototyping: KL-Kopio

The student project for KL-Kopio aimed to develop the company's existing digital printing service. The existing service was running on the company's premises, so the students did research on the present state of the service, making notes of its pros and cons. After analyzing the present state of service, the students started developing new versions of the service, and building prototypes, which were used to evaluate the viability of the concepts.



Figure 5 Digital printing services prototyping with role-play

The service prototype was built in iterative cycles: students built a version of the service environment into a prototype, and tested out their ideas with role-playing methods. These

results helped them to refine the prototype, which was essential for a more defined experience. The refined service prototype was then used to communicate ideas to the company representative. Students had emphasized the role of the spatial design of the digital printing company's premises in the prototype. The company representative felt the prototype helped him better understand the service from the customer's point of view (Konttinen, et al., 2011).

This phase is referred to by Moritz (2005) as explaining, which is essential for shared understanding; in this case, between the students building the service concept and the company representative, as well as those testing the concept. The prototype was a communication tool for the students to explain their concept ideas to the KL-Kopio representative, but it also made possible the alteration and testing of several variations of the service path. This also helped evaluation and decision-making for the final service concept.

Participation in the service prototyping project helped the company gain not only a new service concept as a result, but also knowledge of service design methods and tools for prototyping. KL-Kopio CEO, Kimmo Lehtonen, says the service prototyping has raised understanding of and attention paid to customer service situations, how customers are confronted and the environment where the service is taking place (Konttinen, et al., 2011).

Conclusions

This paper has given a short overview of service prototyping and its roles in service design process. The SINCO laboratory concept is an attempt to outline a transferable model of a service prototyping environment with the key elements of Servicescape Simulation; Service Stage; Digital Touchpoint Toolkit; Rough Mock-up Crafting; and Teamwork & Documentation Tools.

As shown through the case studies, experiences of prototyping with agile use of technologies give benefits in different phases of the service design process. Prototyping with servicescape simulation can help add value to customer insight by activating users' schema, enabling them to capture the intuitive reactions, attitudes, goals and needs along the service path. Service concepting through prototyping and experimentations during the creative phase help the understanding and utilizing of technological possibilities, as well as the socio-emotional aspects of interactive systems. The service stage, with an illustrated service context, facilitates co-creation workshops with different stakeholders. In the evaluation phase, prototyping works as a powerful knowledge-transfer mechanism (Konttinen, et al., 2011), whereas the use of agile technologies enables the rapid setting-up of the desired service paths as higher-fidelity experience prototypes.

The challenges faced during the SINCO laboratory development and the case projects include the change of rigid working patterns of individuals and team members' heterogeneous technological expertise. The use of the Toolkit also requires sufficient technical skills, especially in an academic operating environment that requires clear instructions, streamlining of the recurring set-ups and technical upkeep of the systems.

Experience prototyping, role-play and unprompted experimentation are also often difficult for new students and partners, who require training to throw themselves freely into the creative mode required by prototyping. In their research, Oulasvirta, Kurvinen and Kankainen (2003) also found that bodystorming and acting out different situations can be frustrating for participants and entail costly preparation. They propose that acting could be useful in the long run when participants are used to the method. The importance of a skillful

group leader, who is able to probe participants to discuss how design ideas would work in an observable context, was also highlighted in their research.

Prototyping with different technologies prompts discussion about fidelity versus agility, balancing effort and benefit. For that reason, an important goal in the development of SINCO laboratory tools has been minimizing the laboratory user's technical tinkering with actions common to every prototyping case. Digital devices are not an end in themselves. The purpose of the technology is to help prototyping by speeding up and making it possible to vary the means of concretizing ideas. In our experience, digital facilities cannot entirely replace the use of physical props and mock-ups. Rather, the physical and virtual settings should supplement each other as an inventive mixture that helps concretize the issue being studied, communicated or tested with the prototypes.

As this paper has focused on introducing SINCO laboratory as a practical facility created as a result of the ongoing action research, more in-depth academic investigation about the benefits and shortcomings of the SINCO-based methods is needed and will be conducted in future. For instance, the effect of servicescape simulation compared to both prototyping a service in an actual place or role-playing without any scenery settings will be examined.

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Co-creating collaborative food service opportunities through work context maps

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Abstract

This paper presents a co-design workshop method where the participants use context maps of work activities as tools to visually explore collaborative service opportunities inside a food producer community. As an example the paper describes experiences from using the method together with small local food producers. During the workshop the food producers created and transferred knowledge regarding their work from the individual work maps to co-created future service maps. Although the food producers never had worked in these settings before, they had no problem sharing and co-creating complex work scenarios. The method uses both visual and verbal tools, which enables the participants to create a detailed service story as well as a visual overview. The use of the method encouraged the food producers to create service ideas, but it also started a dialog on how to bring the service concepts out to the real work context. The paper also reflects upon the method's potential in supporting service designers.

KEYWORDS: work context maps, creative communities, design method, visual tools

Introduction

Today, much of service design research and service design practice is closely related to bigger cities with a high density of companies. The focus of service design in these settings is often on the relationship between the company and the customers. On the Swedish countryside, the picture is very often the opposite. Here we have a low presence of service design thinking, and the majority of the companies in these regions are scattered clusters of micro companies with low design awareness. We believe that service design as an approach to innovation has a lot to offer the countryside and its inhabitants. Having participated in a number of local service development projects, we also believe that organizations, researchers and practitioners interested in creating relevant service innovations in the countryside

context need to follow a design approach based on co-design and community thinking. One of the service projects we have participated in was the Digital Service Markets (DSM) project. The aim of the DSM project was to explore and develop distribution and communication services between small food producers and different municipal departments. In this project we started to explore and develop a workshop method for co-designing service innovations inside a community (Sandberg, 2010)

There are many benefits from using co-design in service design projects. (Steen, Manschot, & De Koning, 2011) have analyzed literature and design cases where co-design was present and they identified three categories of benefits. The three categories are: Benefits for the Service Design Project, such as improving the creative process. Benefits for the services customers or users, such as creating a better fit between the service offer and customers or users needs. Benefit for the involved organizations, such as improving creativity and enthusiasm for innovations. They also highlight the importance of selecting appropriate methods and ways of working in order for co-design efforts to be effective. Another important aspect of using co-design is the idea of relevance. It is more likely to create cultural relevant services when you move away from individual creativity to a collective creativity (Sanders 2001).

In the literature there are several descriptions of the importance of involving non-designers in the design process and how different visual tools can support the co-design process. It is not our intention to give an account for all the researchers and concepts in this paper, but we will introduce some concepts that can support and position the idea of the workshop. Context-mapping (Visser, Stappers, van der Lugt and Sanders, 2005) actor network mapping (Morelli and Tollestrup, 2007) and co-design space (Sanders and Westerlund, 2011). This paper describes our experiences from inviting small local food producers from the countryside of Småland to a first real prototype test of the creative customer community workshop method. We begin by describing and positioning the workshop activities. Then we describe our experiences using the method. We conclude by suggesting how others can use the workshop and describing how we hope to use it in the future.

The workshop method

The workshop is an activity where different visual and tangible tools are used in order to support participant's verbal descriptions of new services. The workshop is situated in the first stages of the front end of the design process. The purposes of positioning it here is to involve the end users early on in the design process and to increase the number of ideas for transformational innovations. The process and tools in the workshop are aimed at generating ideas that both can be implemented into cross-functional teams and developed further by consumer communities. The final goal of the workshop activity is to create a collaborative service concept in a local food producing culture.

The workshop can be performed either during a single occasion or as separated shorter activities over a longer time period. Regardless the time frame or the number of the workshop activities it is always important to have a space that supports the process. The space is an information ecology where the right combination of media, room, facilitator and processes supports the interaction between the participants (Nardi & O'Day, 1999).

The workshop follows a clear structure where the researcher or the designer takes the roll of a facilitator that prepares and presents the activities. The participating company owner's

The understanding step

The workshop started with each food producer presenting themselves and what a work year means for them. To support this activity each food producer had their own work activity map as a visual reference. During the introduction the maps were placed on an easel in front of the other food producers. This made it possible for the presenting food producer to interact with both the map and the other companies. When the first map was placed on the easel it immediately raised a question among the other food producers: *this map doesn't look like my map, why?* This question then became the starting point for all the presentations and it resulted in phrases like: *my map looks like this, because our company works with two product-lines.*



Figure 2 Participants using their work map to present; work activities, involved stakeholders, problems they have, strengths and dreams for the future.

During the presentations the food producers used the work map in various ways. Some used it only as a support for describing the work structure others followed the map exactly. All food producers managed to create and share a detailed story about; invoice activities, product activities, collaboration partners, employees, location, marketing activities, problematic events and much more. Each presentation took about 15 minutes.

The observation step

By the end of each presentation the workshop facilitator asked the food producer, *which problem on the map would you like the others to create solutions for?* The food producers chose marketing and logistics as problems to work with. When each food producer had chosen the problem, they returned to the table with the other food producers. Then the entire group were handed pens and solution concept papers.

The solution concept paper is an A4 paper with three columns; the first is for the name of the concept, the second is for a short description of the concept and the third is for hand drawings. This supports the idea of making the sharing activity quick and more lasting. The different columns open up the possibility that all the participants can find one way of expressing themselves. When the paper is filled in, it can be used during the entire workshop and finally end up at the problem owners company.

After the three columns were explained, the food producers spontaneously started to explore the selected problem. They asked questions, they created parallels with their own work situations, they involved the work activity map and they described existing solutions. The discussions about the problems were very vivid and it resulted in many relevant discussions. One problem was to steer the solution dialogs down to the solution papers. After a few

reminders they created and explained the solution on the A4 paper. When all the food producers had created a solution, they hold up the paper and gave a short explanation of the concept. Some of the solutions were new to the problem owner, whilst others were already tested and condemned. So both the problem owner and the other food producers learned a lot from listening and creating solutions to the others' problems.



Figure 3 the participants learned from each others trends and problems.

The ideation step

After the vivid discussions about problems and solutions we took a break with coffee and trends. This activity was meant to serve as a bridge between today and the future. Before the coffee break the food producers were asked to think about work related trends. When the workshop participants returned from the coffee break they found a pile of blank trend cards on their desk. The food producers were asked to write down the trends on the cards and place them on the wall in front of them. After placing the cards on the wall each food producer explained their cards to the others. The majority of the trend cards were about food trends such as; craftsmanship, lactic acid, handmade sausages and sourdough bread. The rest of the cards were mostly about; health, environment, control and lack of knowledge. The trend activity ended with the food producers putting up all the work activity maps and the solution concept papers next to the trends. The purpose of putting up all the material was to create an inspiration collage for the next activities.



Figure 4 explaining and creating a community and new collaborative food services

Before the last two workshop activities, the participants were divided into two groups. The groups were given the tasks to first analyze all the material they had put up on the wall and secondly to co-create a future service concept that would help a larger group of local food producers. To support the activity of co-creating service concepts, the groups were placed at small tables where different visual thinking materials were available for them. The visual materials were; paper, sticky-notes, game pieces, pencils and objects in different shapes, colors and sizes. The two groups analyzed the visual materials on the wall. Three topics were particularly interesting for the groups; quality of life, interaction and pushing down expenses. With these topics the groups went back to the tables and started to explore the future contexts and its possible food services.

The prototyping step

Each group used one large sheet of cardboard as a stage for the future service concepts. On the stage, the groups used the game pieces and the sticky notes as tools to explore the future and the involved actors and their actions. During the exploration the groups moved back and forth between describing their own work experiences, framing the future and creating service concepts for collaboration. When the groups were ready with the concepts they were asked to present the concept to the others.



Figure 5 needs and dreams are expressed verbally and visually.

During the final presentation the cardboard sheet was a central part of each presentation. The food producers gathered around the cardboard stages and watched and listen to the different service stories. The combination of talking and moving around the artifacts on the cardboard stage created both a detailed presentation and an overall view. Through the verbal presentation the food producers described the overall ideas and the invisible activities that took place between the different game pieces on the cardboard stage. The food producers used the different game pieces and the other artifacts to show; geographical distances, clusters, flow, touch points and rural and urban areas.

This is a transcription from one of the group's verbal service story:

The future Sweden is a place where the oil prize is so high that people can't afford using their cars as means of transportation anymore. There are no longer any shopping malls or bigger food stores in Sweden. As a way of increasing the life quality of all Swedish citizens, there is a food distribution system supported by small local food producers

Between the food producers and the city there is a distribution centre. The food is gathered and transported from the food producers to the centre. In the centre the food is stored and arranged. From the distribution centre the food is transported in to the city by an environmentally friendly car.



Figure 6 the final design material

Reflections about the future food services workshop

During the first stage of the workshop the food producers' individual work activity maps played a key role. The maps were the first time the food producers were given a visual insight into the other food producers work activities. It became clear how important the visual differences on the maps were. Through the visual differences the food producers could quickly compare and create a basic understanding of the different participating food producers work systems.

During the problem solving activity and the trend activity the food producers showed a great interest in each other's work situations. It was a very open dialog, where they shared knowledge from their own work experiences. When the solution paper was introduced in to the solving activity, it created a disruption in the dialog. The solution paper needed to be explained and the food producers were not used to pin down their thoughts on paper. Although it was good to have their concepts on the papers, the solution activity needs to be redesigned and be more integrated in the dialog flow.

One interesting aspect from the trend activity was that they all chose food courses as a growing trend. When the food producers put up the trend cards on the wall it became visually possible for the food producers to see relationships and clusters. When the group saw that they all had written topics related to food courses, they started a deeper discussion about selling food education. All the participating food producers described how they spend more and more time on educating people about food.

The use of a cardboard stage and game pieces in different colors and shapes worked well. The ability to move around and create new game pieces supported the group dialog and it brought the service stories forward. Even during the final presentation the pieces on the cardboard were moved around to illustrate how the service was working.

The thing that surprised the most was how the food producers created detailed stories about the context and the services. The combination of the verbal story and the different artifacts created a very thoughtful and inspiring design material. During the workshop the food producers managed to create and share much information about their needs and dreams.

Discussion

When we started to develop the workshop, we already knew that the motivation to participate needed to be bigger than the barriers that hinders from participation. Through the invitation process we learned that some barriers such as time and space are easier to overcome than hidden barriers such as individual conflicts between the company owners. We invited ten companies to the workshop, three of them participated. We learned that it is important to find and work with workshop participants that are eager to learn from others. Before the workshop we send back a copy of the work activity map as an invitation to the map owner. This was appreciated by the participating food producers.

We have now tested the workshop with three small food producing companies. Our experience from using the method is that good dialogues emerged because it allowed the food producers to share their own work experiences. We noted that the expressed solutions and the other discussions during the workshop mostly were taken from the food producers own work experiences. Each individual food producer has for many years tested different ideas and products that they think either work or don't work. From our workshop

experience we have learned that visual tools such as maps can greatly support and organize the process of creating and sharing work knowledge.

We also noted that the food producers learned something new about being creative in a group during the workshop. By the end of the workshop the food producers said; now when we have learned about each others needs and dreams we want to continue being creative in a community or collective.

The collective creativity is an idea about creating relevant innovations that are becoming more and more important for companies. Prahalad, (2000) describes it as customer communities. The initial focus in customer communities was for a long time on business to business communities. But the internet has changed the relation between the customer and the company. It is now so easy for people to create online communities with high level of information that the focus has shifted towards consumers having an equal dialog with the service provider. The notion of customer communities can be a little bit confusing in the countryside context. The small food producers in this context are often referred to as multifunctional companies, i.e. they are involved in many different work activities and they are also acting as makers and users at the same time. If we see them as users, they are actually using a lot of different services. And as makers most of them have in one way or another, created communities where customers can share and create new food products. But they don't have the tools or experiences from creating situations where they physically meet as a food producing community and create new collaborative food services. That's why it is so important to explore and prototype visualizing tools for small companies.

Using design games or generative tools in co-creation is well explored in research settings (Sanders and Binder, 2010). But we believe it is important to explore and developed design tools for designers working with very small companies. This workshop is just one minor exploration of the techniques and procedures that is needed in the co-design space of communities.

Conclusion

In this paper we have presented a method including mapping techniques in which participating companies create knowledge about each others needs and dreams through the use of visual work maps. This new way of working allows the participants to change perspectives and act out future service scenarios. The outcome of the workshop is a service story and a service map that is open and flexible enough for designers to be inspired and continue working on the service opportunities. Another part of the outcome was that the participants increased their knowledge about their own work context. Neither the participants nor the researchers have transformed the service concepts into functional services. However, based on the experiences gained during this workshop we propose that the method can be used to increase participants' awareness of creating co-value innovations inside a community and empathy in local service development projects.

Future work

During the workshop we learned several new aspects from food producers about their activities. We learned that the creative community is an important part of developing local service innovations. Without a strong community involvement the risk of failure is high but

at the same time it is very complicated to create and lead a long lasting community. What happens when the facilitator leaves the community? That knowledge must be analyzed and more workshops need to be done. Another important step is to bring the method and workshop outcome to service designers and discuss how it can be used in the daily life of a design practitioner.

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Think Services

Supporting manufacturing companies in their move toward services

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Abstract

This paper discusses the use of Service Design to support manufacturing companies in a shift towards services. It uses a program of knowledge exchange for small medium enterprises (SMEs) conducted at Lancaster University, as a case study to investigate and illustrate the role Service Design can play in traditional product centred companies. Through investigation of the concepts and implications of the new service dominant paradigms, the authors suggest how designers can facilitate a reframing process, within manufacturing SMEs, leading to a new understanding of value that can ultimately activate a company transformation.

KEYWORDS: servitisation, service innovation, service design

1 Introduction

Thirty years ago Richard Chase and David Garvin (1982) were proclaiming: “tomorrow’s leading manufacturing companies will be the ones whose managers unleash the service potential of their factories” (p. 68). They explained a ‘Service Factory’ as a company moving its focus away from how well it builds products, to how well it serves its customers before and after the production of goods. In line with this vision, today the trend for manufacturing organisations to move ‘downstream’ is a well-known and studied phenomenon (Baines et al., 2008).

This paper describes a knowledge exchange program for manufacturing SMEs to introduce Service Thinking and Service Design to support ‘servitisation’ processes. It illustrates how the workshops series and design exercises provided an initial basis for companies to reframe their understanding of value co-creation.

2 Servitisation

The process of integrating service offerings was originally defined by Vandermerwe and Rada (1988) as ‘servitisation’ and described as the increasing offering of “fuller market packages or ‘bundles’ of customer focused combinations of goods, services, support, self-service and knowledge” (p. 314).

The motivations behind servitisation are generally described in terms of economic, strategic and market opportunities (Mathieu, 2001a). In economic terms, services represent a continuous and more stable stream of revenue with higher profit margins. Services are also perceived as a competitive lever, more difficult to imitate than products or technology. Finally, services are considered as a significant component influencing purchasing decisions, with the potential to generate more stable and longer relationships with customers (Mattheiu, 2001b).

Servitisation is not an easy process and it can take various degrees and forms. The move towards services requires a ‘strategic intent’ for an effective implementation. Richard Chase (1981) described it as a continuum, moving from pure products to pure services organisations. Depending on the starting and target point in this continuum and on the strategic relevance of this evolution, companies may face different challenges and may need to embark on significant organisational transformations. Oliva and Kallenberg (2003), considering organisations selling durable manufactured products, have been describing four main stages: 1) consolidating product-related strategies; 2) entering the installed based service market; 3) expanding the relationship-based services; 4) expanding the process-centred services; 5) taking over end-user’s operations.

When companies consolidate their value added service offering, they focus on improving efficiency and service quality, but the focus is still on the products. The shift to a ‘installed based service’ market requires a shift from product-centred manufacturing to service centred organisations. This shift is generally supported by the set up of a service team that creates and manages the new service infrastructure and provision. The next possible transition is then the shift from a ‘transaction-based’ to a ‘relationship based customer interaction’, where the companies create maintenance based service contracts that require different pricing and risk management strategies. The closeness with customers grows when companies decide to move from a product-oriented service to an ‘end user’s process oriented service’. Here companies use their knowledge and skills in product development and management, to ensure that clients can optimise their processes and the use of their machines. This last shift

requires “intimate knowledge of the clients’ operations and how the service will support core activities” (Matthieu, 2001a: 40). These ‘advanced service strategies’ require more proactive approaches to service development. The knowledge developed in these processes can allow companies to potentially take over the management of specific operations within the client organisation.

2.1 Challenges and costs

When entering a service market, manufacturing companies have to consider additional costs and challenges, in addition to the benefits afforded. Valerie Mathieu (2001b) describes two main kinds of costs: competitive and political. Integrating service offerings means entering into the service-providing competitive field; in this field companies have to consider the threat of more experienced service providers and distributors, and have to convince their customers of the value of their offerings. Companies have to make strategic use of their brand value and have a deep understanding of their products in relation to their service offerings, or they may create partnerships or acquire other companies in order to gain more visibility and strength. In addition, companies also need to face internal conflicts. Matthieu described servitisation as a political process that needs to build consensus across the organisation. This consensus is generally reached by the establishment of subcultures in the form of service units. Entering a service field also requires significant changes in the organisational structure. As Gebauer et al. (2008) suggest, “to exploit the opportunities of services successfully, manufacturing firms have to establish the appropriate alignment between the external environment, service strategy, and factors of organizational design” (p. 20). Depending on the service strategy managers may need to change and adapt several factors in the organisation, not least its corporate culture. A service culture is significantly different from a product centred culture. As Levitt (1977) described it, service companies think humanistically, while manufacturing companies think technocratically. The integration of service provision requires an overall shift from a product-centred organisation to a customer-centric one (Galbraith, 2002). This can happen only when managers realise that their main assets are people (Matthieu, 2001a).

3 Service Thinking

The change process in becoming more customer–centric implies a change in the way companies think about themselves, their identity and their position in the market. Challenging the existing worldview and belief system can have a transformational impact (Levy, 1986). The authors describe ‘service thinking’ as the potential driver for this transformation and ‘service design’ as a methodology that can support and guide companies

through this process. Service Thinking as a framework and strategic tool for innovation has its roots in a new way of thinking about value that affects the way products and services are conceived:

1- *From value added to value co-creation and value-in-use*: In a traditional industrial mindset, value is conceived as embedded in physical products. Consumers are instead perceived as ‘destroyers of value’ as they use and consume the goods they’ve been offered. In an alternative and contemporary view of value, consumers actually co-create value by interacting with producers and other partners (Ramirez, 1999). In this view, value is not in the object or person, but ‘resides [...] in the actions and interactions which the acquired resource makes possible or supports’ (p. 51). Similarly, researchers from IBM have brought the attention back to the notion of *value-in-use* or utility value instead of the notion of *value-in-exchange* that has since been the basis for the science of economics. ‘Value in use’ suggests that ‘there is no value until an offering is used - experience and perception are essential to value determination’ (Vargo and Lush, 2006: 44). Value-in-use is inherently relational and experiential.

2. *From units of output to mutually satisfying interactive processes*: the change in the interpretation of value implies a change in the description of products and services themselves. When value is recognised in the process of use, the focus shifts from the units of output. A service, therefore, represents “the process of doing something beneficial for and in conjunction with some entity, rather than units of outputs—immaterial goods- as implied by the plural ‘services’” (Vargo and Lush, 2008). Goods are then interpreted as aids to the service-provision. The original dichotomy between products and services is resolved by proposing a higher-order concept of service. Norman and Ramirez (1993) describe products or services as *frozen activities*, manifestations of the relationships among the actors in value creating systems, and therefore generally defined as *offerings*. Here services are described as a conceptual framework within which to think in a different way of value creation (Ramirez, 1999).

3. *From individual actors to value creating systems*: if value exists only when customers do use the offering, companies can only offer ‘value propositions’. Value propositions work as connector and resource integrator within a service system. Here the strategic focus is no longer on individual activities, but on the overall *value creating system*. Within this, different economic actors can work together to co-produce value (Normann and Ramirez, 1993). In this scenario, value-in-use can be extended to the concept of ‘value in context’.

The consequences of this emerging service dominant framework for traditional manufacturing companies can be described as the need to:

- look for value creation in different contexts and forms outside the companies’ boundaries and adopt the customer’s perspective;

- reframe value propositions around the processes and interactions that generate benefit for the customer's own activities (value in use);
- develop the ability and willingness to look at the value networks (value in context) and customers' overall practices in a proactive way in order to identify new opportunities for innovation.

4 Service Design and Service Thinking

Thinking in terms of services has been a recent evolution in the practice and theory of Design as a discipline also. Service Design developed as an answer to a changed economy in the '90s, considering services as a possible and necessarily new object of design. Since its first articulations Service Design has been adopting a customer centric approach, focusing on the interactive and relational character of service quality (Pacenti, 1998). By focusing on the interactivity dimension, Service Design has identified service experiences as a central area of design intervention. The capacity to deeply understand users' experiences and the contexts of service provision and use is at the core of service designers contributions to service innovation (Meroni and Sangiorgi, 2011). In this sense service designers propose a 'outside-in' approach to innovation, that focuses on where value is actually co-created.

By focusing on people's experiences and practices, designers adopt what Galbraith (2002) defines as 'convergent thinking'. This asks what the best combination of offerings is, that can fully satisfy customer's needs, rather than multiplying the possible uses of existing products. As Kimbell (2011) noticed, service designers seem to look at services as fluid arrangements of human and not-human artefacts, rather than a fixed intangible unit. This ability to think in terms of solutions helps to break down barriers for novel collaborations and considers value at the centre. With the intent to understand the wider context influencing service interactions, designers have adopted the concept of 'information ecology' (Nardi and O'Day, 1999) to services, introducing the idea of 'service ecology'. Mapping out service ecologies is a way of identifying unnoticed opportunities and resources to reframe service configurations and interactions. The authors propose that the capability to creatively look at where value lies could be applied to support companies embarking in a 'servitisation' process. As suggested by Hartevelt and Raaijmakers (2011), this capability can be used at a project level and at a business level. Similarly Junginger and Sangiorgi (2009) describe different depths of service design projects in an organisation moving from redesigning service interactions, towards challenging existing fundamental assumptions to potentially activating a transformational journey. Based on these considerations, a series of three workshops were developed with the aim of translating Service Thinking and Service Design into knowledge exchange activities, which would initiate manufacturing SMEs into this particular approach to innovation, and to

evaluate the effectiveness of this programme.

5 Innovation through Improved Service & Design

ImaginationLancaster organised and delivered in collaboration with the Institute for Entrepreneurship and Entrepreneurial Development (IEED), a workshop series for manufacturing SMEs located in the North West of England aiming to make Service Design more visible and understandable. The workshop series was delivered as an element of the Innovation for Growth (IFG) project, which is part-funded by the European Regional Development Fund. IFG offers advice and support to embed innovation within the business and management processes and practices of 300 North West SMEs. The workshop series was also part funded by the Design Council Grant, that covered the fees of two designers, Gavin Maguire (Engine) and Steven Johnson (The Hub), that participated in the development and delivery of the events. This workshop series was articulated in three half days events that were aiming to provide SMEs with the knowledge and some practical tools to integrate service thinking and service design into their businesses. As a support to the workshops, companies were provided with a booklet detailing the main concepts, case studies and practical tools, and with access to a wiki space, from which they could download tool formats and record any thoughts, questions or feedback. Of the 14 companies who participated in the programme, nine represented traditional manufacturing SMEs, while five represented knowledge based professional services. At the end of the three events, two companies had the opportunity to work for a month with 2 postgraduate Masters design students to implement part of their action plan.

5.1 Workshop 01: The Role of Service Thinking in Product Orientated SMEs

The first workshop, facilitated with Steven Johnson, aimed to help companies to understand how Service Thinking could increase competitiveness and improve customer relationships. The session comprised an introductory lecture on Service Thinking, a presentation of The Hub's work, and three exercises that looked at the elaboration of value propositions based on a new understanding of value:

- *Tool 01: From Function to Benefits*: The aim was to translate a list of functions into a list of benefits for customers. Companies were asked to look at and think about their own offering from the customer perspective.



Figure 1 Workshop participant filling an Experience Blueprint

- *Tool 02: Experience Blueprint*: companies were asked to map a well-known process, and then to visualise the related customer activities, both visible and invisible. By understanding the customer journey and context of use companies could unveil opportunities to better support clients' work (value in use).

- *Tool 03: Resources Map*: this tool was used to map the resources used by the company and the client during their interactions, and to then imagine resources used by the clients in their context of use (value in context). This exercise aimed to illustrate how companies could make their offering more compatible, synergetic, complementary or integrated with the client's own resources.

5.2 Workshop 02: Customer Centred Innovation

This second workshop, facilitated by Gavin Maguire, aimed at introducing companies to Service Design methods for identifying and defining new or improved service offerings. The session comprised an introductory lecture on Service Design, a presentation of Engine's work and three exercises. These looked at elaborating customers' profiles and journeys to re-think the companies' offerings in relation to clients' needs and experiences.

- *Tool 04 - Customer types*: companies were asked to identify and list Customer Types in their clients' portfolio to better design offerings that fit their clients' needs and behaviours;



Figure 2 Companies completing their Customer Journey Maps

- *Tool 05 - Persona*: companies were asked to articulate one of their customer types into a persona, which is a fictitious character created to represent different types of users. This exercise illustrated how a well-developed persona could be used to focus conversation on the needs, goals and behaviours of real users, or could support the evaluation of design decisions and specifications;

- *Tool 06: Customer Journey Mapping*: companies were asked to develop a Customer Journey Map based on the developed persona. Once the journey was mapped the companies were asked to track the positive or less positive encounters and to develop ideas on how to improve negative ones.

5.3 Workshop 03: Service Development and Action Planning

This last workshop aimed to develop emerged opportunities into refined concepts and generate plans for implementation. The session comprised an introductory lecture about service development and three main activities aiming to illustrate how to quickly develop and evaluate emerged ideas into more refined service concepts. An action plan on how to implement ideas and tools in their company was then developed and presented by each participant.

Tool 07 – Service Design Principles: companies were required to write down five Service Design Principles rooted in the company's service strategy and based on their insights into customer needs;

Tool 08 – Pitch Card: 'Pitch cards' are a quick way to start fleshing out ideas as they emerge from a brainstorming session. Companies had to summarise benefits and potential for each idea;

Tool 09 – Ideas Scorecard: with the Ideas Scorecard companies compared the relative merits of different ideas based on key criteria that have been created by the company itself.

5.4 Participants feedback and action plans

A selection of companies was interviewed before the workshops to look at their service dimension, level of customer focus and design awareness. These aspects were then evaluated at the end of the workshops to present any changes in their understanding or strategies. Also after each workshop, the authors summarised notes on questions and feedback from companies on the wiki space to document reactions to concepts and exercises. Finally companies were asked to fill in an action plan form and present it in front of a video camera. The key concepts that companies wanted to implement were:

- a more customer focused approach to their businesses, moving from a passive to a more proactive way to investigate their customers' context of use;
- a more effective way to recognise and communicate the value they currently create for their clients looking at their offering from the customers' perspective;
- segment their customers using the persona tool to better develop their offering, balancing resources with benefits, and specify their service packages;
- a systematic approach to service innovation, as they were mostly familiar with product design and didn't know that 'such a thing as Service Design did exist'.

Most of the participants suggested that they planned to disseminate within their businesses what they had learned during the workshop programme and would set up a team to go through the methodology again and develop further their findings. Some companies identified the need for operational changes, for example, the need to redesign their communication materials; others highlighted the need to set up a different and more customer centred innovation process; whilst others suggested the need to re-think the service strategy and the mindset of the organisation, moving from a manufacturing centred culture to a service or product *plus* service culture. This in particular was seen as a significant challenge as the participants realised that before selling their services to clients, they needed to sell this approach internally. The strategy some companies described was the one to create a dedicated service design team that could apply the suggested tools and initiate a cultural shift in the wider organisation.

6 General considerations

This workshop program was particularly successful and well received. Companies manifested the need for more design training and would have liked further support in their implementation plans. Workshops appeared to have been effective in introducing a new way of thinking and a more systematic and customers centred approach to service innovation.

The challenges of servitisation, as described in the literature review, were all clearly present and articulated by SMEs participants in their comments and implementation plans. All these challenges could be summarised in the need to move the organisation from a product focused to a customer centred and service focused approach and strategy. The tools and activities provided tangible means to start a process of reframing the understanding of their identity, offerings, competences, innovation processes and market strategies around a new description of value. As part of this reframing process, companies aimed to develop capabilities to better investigate how customers create value in their practices, generate service ideas and packages able to support these practices, communicate their value in an effective way, generate dedicated service design teams able to convince the leadership of the value of this new approach.

These workshops therefore were able to provide the seed for possible radical transformations, but the research team was not able to follow companies in their implementation and document how the new knowledge and tools were actually applied. Also the authors realised how this exchange program could have been further developed with interdisciplinary contributions on issues such as pricing strategies, business model development and organisational change.

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Open Experience Journey Design

Developing an approach to the collaborative user-driven ideation for innovative services

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Abstract

Most of service design projects are usually executed for the sake of providers of these services, whether they are profit-seeking companies or are non-profit public organizations. Although such a provider oriented design approach is appropriate for reforming existing services or for transforming these into a new ones, the scope of innovation is inevitably biased toward the interest and competence of the provider. We introduce in this paper a user driven design approach for service innovation called Open Experience Journey Design, which allows users or consumers themselves to ideate desirable services in collaboration with each other without specifying any predetermined service provider. In particular, Open Experience Journey Design incorporates imaginative association techniques to assist and promote to generate innovative ideas beyond the boundary of conventional thinking. By testing the approach in a service design workshop, it is revealed that the ideation techniques indeed stimulate to create an idea for a service system, connecting two different utilities into a consistent user value chain. Based on these findings, we further developed an online platform called Experience Journey Laboratory to integrate the technique of crowdsourcing with Open Experience Journey Design.

KEYWORDS: open innovation, crowdsourcing, collaborative design, experience journey

1. Introduction

As the value of a service is realized by the participation of its users, it is critical for designers to understand behaviours and emotions of users in order to find out some insights for design. Sometimes service designers also have to reveal hidden needs and opportunities that even users or its provider do not recognize explicitly. Therefore service designers often organize co-design workshops inviting those users and the member of the service provider

to let them collaborate to come up with ideas with consideration of each concern. Moreover, other stakeholders such as suppliers to the service providers may also be asked to participate in design projects. Such inclusions of multiple stakeholders into design processes are becoming more important for designing highly complex services of these days as values of these services are co-created within the ecology of service systems (Miettinen and Koivisto, 2009).

Recently some firms and organizations further started to apply so-called open innovation approach to their design projects using techniques such as crowdsourcing (Chesbrough, 2011; Sloane, 2011; Howe 2009). Resorting to some customized online social platforms, these firms and organizations provide a large number of people with opportunities to join in the projects to collect from them various insights and ideas for developing new products and services. In such settings, innovative ideas are expected to emerge from the interaction among these participants with different perspectives and unique opinions. Some of successful crowdsourcing projects are attracting highly motivated participants even without any monetary rewards because participation in such projects and their engaging experiences become intrinsic rewards for them (Malone et al., 2010; Benkler, 2007). As for a design consultancy, IDEO recently developed such an open design platform called OpenIDEO to crowdsource ideas solving current social issues. It simplifies their popularized design thinking method such that participants follow the steps of inspiration, concepting, and evaluation to generate in cooperation ideas solving a problem given by IDEO and its sponsor organization.

All the approaches to include users in the design process mentioned above are more and more adopted by both consultancies and service providers, and are indeed showing effective results in reforming an existing service or for transforming it into a new one. However they have certain limitations when applied to innovating new services. As long as these design projects are implemented for the sake of a predetermined service provider whether it is for a profit-seeking company or a non-profit public organization, its scope of innovation and the value of designed service are inevitably biased toward the interest and competence of the provider. In other words, in these projects the participants always presuppose who is or are in charge of solving the problem. In addition, a usual crowdsourcing project such as OpenIDEO requires certain skills and knowledge of its participants in order for these to contribute to and engage in the experience of the collaborative design process. Indeed, the active participants in current crowdsourcing projects are inclined to be design-minded people, which may include professional designers, or lead users of the services i.e., those who have either creative thinking skills or advanced knowledge and experiences in the problem domain. Because these participants are not always the target users of the service to develop for, the validity of derived ideas become questionable.

To overcome such barriers of current provider-specific co-creative design approaches, we introduce an open and user driven design approach for service innovation called Open Experience Journey Design. In the following chapter, the characteristics of Open Experience Journey Design are explained to distinguish it from other related approaches. Then the ideation process model of Open Experience Journey Design is laid out with emphasis on the two imaginative association techniques. This ideation process model is actually applied to a service design workshop to observe a sequence of creative idea development for designing a cooking related service. Based on the evaluation of the benefits of Open Experience Journey Design, we further develop an online platform called Experience Journey Laboratory to integrate it with the approach of crowdsourcing.

2. Open Experience Journey Design

2.1 Emphases of the approach

Open Experience Journey Design, the proposed approach for a user-driven innovation of services, is distinguished from other related collaborative design methods in several aspects.

First, it does not presuppose any product, service, or provider for which the participants in the design project are asked to come up with ideas or solutions. They focus on a certain category of activity or a topic in their daily lives to find out problems and unmet needs as resources for inspiration and ideation. It neither sets any criterion to evaluate generated ideas from the standards of a certain provider. The emphasis is not on solving a given problem but on the opportunity for the participants to explore and extend their space of desires and imaginations without caring any provider's interest.

Secondly, it utilizes a service design oriented open innovation platform called the Experience Journey Laboratory. Using the platform, participants of a design project collaborate in developing ideas for a service as a system of multiple touch-points and interactions distributed over time and space in daily lives. Instead of asking the participants to explain an idea or a concept for service in texts and images as seen in OpenIDEO, it assists step-by-step ideation process through which an experience journey map of a new service is generated as result. Such a service design oriented crowdsourcing is currently very unique while there are many open innovation platforms and projects focused on product development.

Third, it provides the participants with techniques to empower their imagination and ideation. In particular, the forced association technique (Osborn 1963) and the value chain association technique are applied to the process of generating ideas for new services. By using these techniques, not only design minded persons but more casual participants are also welcomed and promoted to generate original ideas. In addition, such empowerment helps them extend their ideas far beyond simple solutions to a specific problem.

Forth, it integrates the strengths of online crowdsourcing platform with those of offline face-to-face workshops. Whereas problem finding, service ideation, and service concepting are executed on the online platform of Experience Journey Laboratory, journey mapping and storyboarding of new services are carried out in workshops as the latter phases of the project require of the participants more intensive commitments hardly attainable online.

2.2 The ideation process model

The ideation process model of Open Experience Journey Design consists of the four phases: finding needs and problems, ideating single touch-point services, ideating double touch-point services, mapping a journey of service experience. Each of these phases is explained below in order.

Phase 1: Finding problems and needs

The first phase of Open Experience Journey Design is to find problems or needs that people often come across in their daily lives. This process of problem/need finding is performed by collecting personal stories from the participants, in the forms of texts and images, of an unmet need or troublesome situation which they encounter in a scene of some daily activity such as cooking. As such a daily activity (e.g., cooking) usually consists of various consecutive scenes (e.g., menu planning, buying groceries, cooking, preparing a

dining table, eating, washing dishes and so on), stories to be collected are expected to cover needs and situations in such various scenes.

Phase 2: Ideating single touch-point services

The second phase of Open Experience Journey Design is to generate ideas for meeting unsatisfied needs or solving the troublesome situations at a single touch-point. In this phase, a forced association technique is applied to the process such that the participants are asked to associate a story of need or problem with some stimulus word to come up with an idea of a product or service that gives a solution to the situation. Each pair of a story of unsatisfied or troublesome situation, which is picked up from the collection, and a stimulus word, which is usually a name of some object, person, place, is generated in a random manner and given to the participant. Using such a forced association technique (Osborn 1963) allowing people to shift their attentions and switch their points of views, the participants are promoted to generate non-trivial ideas beyond the boundary of their conventional thinking and imagination.

Phase 3: Ideating double-touch-point services

The third phase of Open Experience Journey Design is to integrate a pair of service ideas derived in the previous phase in order to produce a complex idea of double-touch-point service. Such a complex idea integrates the values of two service ideas for different scenes of the activity. In the case of cooking, for example, such a chained services may connect services to support menu planning and cooking or those to assist menu planning and buying groceries. The participants of the design project are allowed to pick up any pair of two service ideas generated in the phase 3. It is important to note here that an idea of double touch-point service is not just a simple addition or connection of two service ideas. Rather it aims at integrating two ideas to create a mutually complementary relationship between their values. We call such an association technique the value chain association whose deliverable is a core value concept of a new service to be developed into a full service system in the next phase.

Phase 4: Mapping an experience journey

The final phase of Open Experience Journey Design is to develop further the core value concept of a new service, which is derived in the previous phase, into a multiple touch-point service system. Such an extensional development is realized by adding new interactions or touch-points before, between, or after the scenes of double touch-point services such that its core value becomes more enriched and the proposed service system fits and penetrates well into the lifestyle of target users. The deliverable of this phase is an experience journey map of the created service idea.

2.3 The ideation method workshop

We tested the method and process of Open Experience Journey Design introduced in the previous section in a workshop to evaluate its strengths. This section explains how a creative idea for a new service is actually derived using the Open Experience Journey Design by demonstrating a sequence of ideation process observed in the workshop.

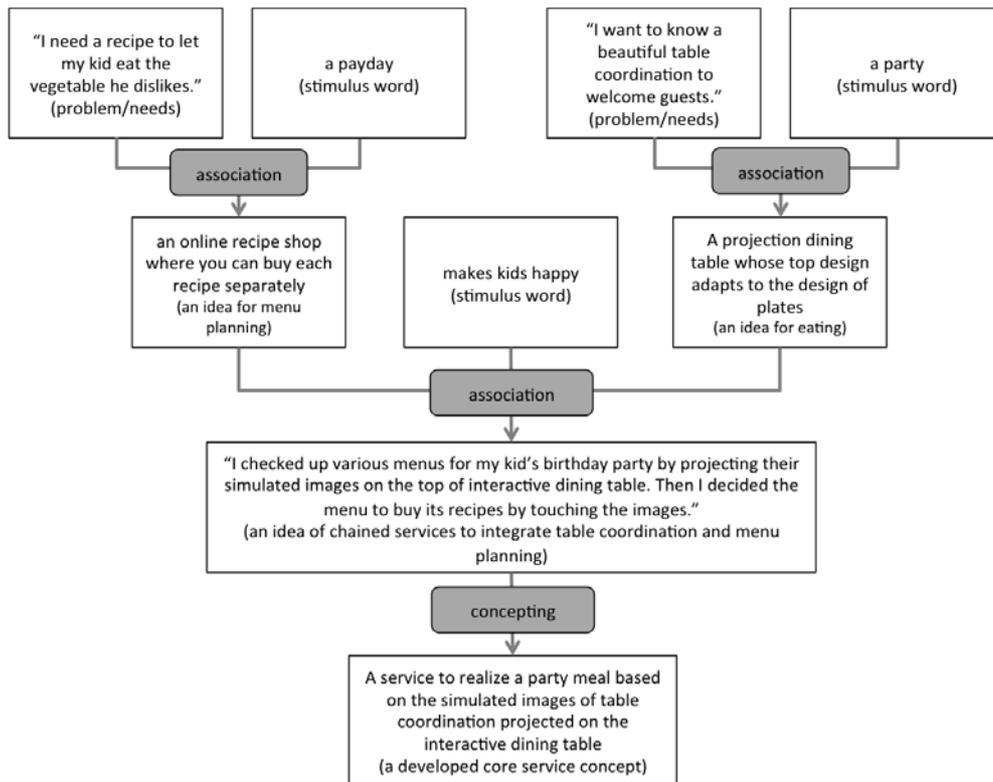


Figure 1 An ideation sequence to generate a new service concept

Figure 1 represents an ideation sequence corresponding to the phase 2 and the phase 3 of Open Experience Journey Design, observed in the workshop to ideate a new service for supporting cooking.

The four boxes at the top layer in this figure represent two randomly generated pairs of a need and a stimulus word. At the second layer, there are three boxes of which the left and the right boxes represent ideas for single touch-point service derived by the forced association between a need and a stimulus word. The box in the middle shows another stimulus word to promote the participants to generate an idea of double touch-point service that is shown in the box at the third layer as a short story of a person using the service. The box at the bottom layer represents a core service concept that captures the essential value found in the idea of double touch-point service and is used for developing an idea of multi-touch-point service in the next phase.

As the sequence tells, the needs for buying a recipe separately and learning table coordination, whose stories were collected in the phase 1, and also their corresponding ideas of single touch-point services, i.e., an online recipe shop and a projection dining table were all integrated into another complex idea of double-touch-point service, i.e., an interactive dining table which allows the user to plan a menu by simulating its table coordination image and also to buy its recipe by touching the image. Here the idea of double touch-point service is not a simple addition of two single touch-point services. The participant of this design project indeed modified the original idea of interactive table-top, which adapts its visual design to the design of physical plates put on the table, into the new idea of interactive table-top projecting an image of a menu of meal. Such an imaginative modification of original idea is necessary for the participant of Open Experience Journey Design to integrate two ideas of

different touch-points or service scenes along with their utilities into an idea for a service system of consistent user value chain.

In addition, as shown at the bottom of the Figure 1, the extraction of core value concept from the short story depicting the usage scene of a double touch-point service brings significant benefits to develop the idea into an idea of more enriched service system. By expressing the core value proposition as a general statement, it becomes easier for the participants to consider possible target users and their value propositions and also explore the possibilities of additional touch-points and functions to be integrated with the service without diluting its core value.

3. Experience Journey Lab.

To implement a design project of Open Experience Journey Design online and integrate it with the technique of crowdsourcing, we developed a website named Experience Journey Laboratory (EJL). This chapter provides an overview of the architecture of EJL.

EJL is an open online platform where anybody can access and join in the service design project. Every design project of EJL proceeds in a stepwise fashion following the four phases of Open Experience Journey Design explained in the previous chapter. In principle, the architecture and functions of EJL are designed such that the online ideation process does not require any facilitation or assistance of professional designers except that a blog component of the website of EJL is used for the project-related announcement from the organizer of EJL and also that the period of each phase is determined by the organizer in advance. All the ideas and comments are posted from the participants who are expected to collaborate on the project by posting comments on the ideas of others or associating ideas of others to generate ones own idea. In other words, these ideas and comments are used as common resources for ideation being open to every participant.

The interface of EJL consists of four main sections distinguished by different theme colours corresponding to the four phases of Open Experience Journey Design. The users move between sections by selecting the coloured tab for each section (Figure 2).

Each section is further divided into two subsections; the idea posting section (the need/problem posing section for the phase 1) and the comment posting section. As for the forth section of mapping experience journeys, a face-to-face workshop is held for mapping journeys instead of asking the online participants to draw and post a map by themselves. Therefore, the subsections here are used for the workshop announcement and posting comments on the journey maps derived form the workshop respectively.

In the second section, i.e., the section for ideating single touch-point services, EJL incorporates a program that generates in a random manner a pair of a story depicting a need or troublesome scene and a stimulus word in order to support the forced association. The participants are also able to switch either the episode or the stimulus word to some other episode or word, or renew both using the same program. They can repeat this process until they decide a pair to associate with. On the other hand, in the third section, i.e., the section for ideating double-touch-point services, the participants by themselves pick up any pair of two ideas of single touch-point services from the list of those ideas.

Note that as EJL was developed in Japan and is currently being tested with Japanese participants, all the language expressions used in EJL are written in Japanese.

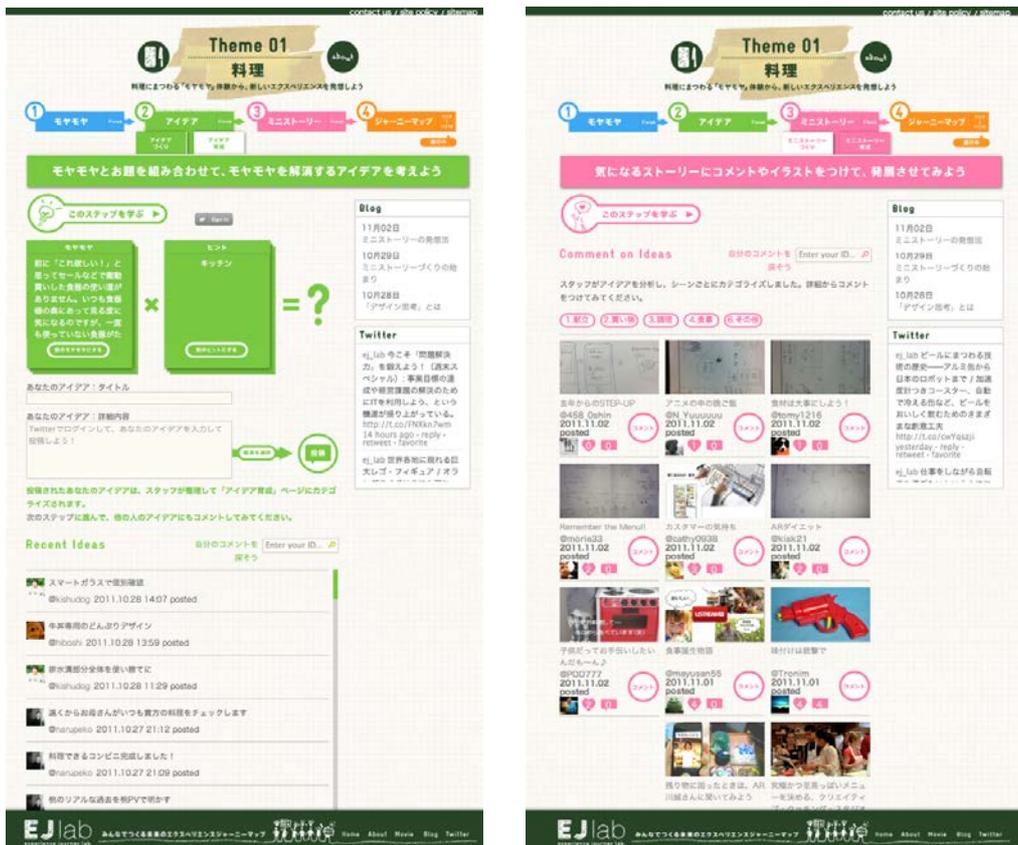


Figure 2 Experience Journey Lab.

4. Experimental design projects

To investigate the practical applicability of EJL, two experimental crowdsourcing design projects have been planned to implement during the period from October 19th to December 3rd of the year 2011. The two themes of the design projects are a service for cooking and a service for fashion. Both of the projects ask the participants to develop an idea for a service composed of multiple touch-points. For each of these experiments, we prepared some example postings on the website for the first three phases so that the participants of the projects figure out easily the process of ideation and expected tasks for each step. Before the launch of the experiment, a Twitter account of EJL was released to have followers to make announcements of the experiments. We are planning to develop some prototypes for the service ideas derived from the online experiments and their following workshops. After receiving comments on these prototypes from the project participants, the strength and effectiveness of EJL will be evaluated.

5. Conclusion

We introduced Open Experience Journey Design, a user driven design approach for service innovation in which users or consumers ideate desirable services without specifying any predetermined provider or product and service category. By testing the approach in a service

design workshop, we observed and demonstrated the sequence of an actual process of such an idea development using an example case. It was revealed from the observation that the forced association technique applied to the process is quite effective for generating non-trivial ideas beyond the boundary of conventional thinking of the workshop participants. Moreover, it was also shown that the ideation technique of associating two single touch-point services stimulates them to generate an idea for a service system, integrating two different utilities into a consistent user value chain. Such a technique of generating a complex idea brings significant benefits to find insights for designing an innovative service as many of recent services are becoming complex systems of multiple touch-points and stakeholders.

Based on these findings, we further transplanted the approach and techniques of Open Experience Design into an online platform to develop Experience Journey Laboratory. By using EJJ, a large number of consumers or users of services are able to explore their space of imaginations in collaboration with others to create ideas with no bias toward the interest and competence of a certain service provider. To prove its practical applicability and to advance its further development, EJJ is being applied to actual crowdsourcing experiments for service design projects. Their analyses and evaluations are expected as continuing future research.

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The rebirth of the SERVQUAL gaps model in service design

Jürgen Tanghe

1 Case background

The service design field is evolving quick and constantly looking to developing new methods.

One particular challenge is how to connect with the many business functions involved in delivering, such as marketing, HRM and operations.

In this workshop we will (re)introduce the SERVQUAL framework to the service design community as a way to contribute to solving this challenge.

SERVQUAL is a product from service marketing and was developed in the eighties by Parasuraman, Zeithaml and Berry. (Parasuraman et al., 1985, 1988

It consists of 1) a conceptual model: the SERVQUAL gaps model and 2) A multi-dimensional questionnaire, based on that model.

1) The conceptual gaps model

The model (Parasuraman et al., 1985; Curry, 1999; Luk and Layton, 2002) defines service quality as the discrepancy between customer expectations and their perceptions of the service delivered. This is labeled gap 5 in the model.

Next to this, the model identifies six more gaps associated with service delivery to customers.

Gap1: Customers' expectations versus management perceptions

Gap2: Management perceptions versus service specifications.

Gap3: Service specifications versus service delivery:

Gap4: Service delivery versus external communication:

Gap6: The discrepancy between customer expectations and employees' perceptions.

Gap7: The discrepancy between employee's perceptions and management perceptions.

2) multi-dimensional questionnaire,

Through factor analysis the SERVQUAL authors identified 10 factors that influence service quality. These were later reduced to 5. They have been popularised through the mnemonic aid as the 'RATER factors':

- Responsiveness - willingness to help and respond to customer need
- Assurance - ability of staff to inspire confidence and trust
- Tangibles - physical facilities, equipment, staff appearance, etc.
- Empathy - the extent to which caring individualized service is given
- Reliability - ability to perform service dependably and accurately

SERVQUAL has been extensively studied and has gained popularity with practitioners in many industries, ranging from healthcare and hotels to banking and e-business.

It has undergone heavy critique concerning the dimensionality and insufficient psychometric properties of the scale (Asubonteng, P., et al. (1996),

Buttle, F. (1996))

We argue that for service designers not the measurement tool, but the conceptual model is especially useful for framing service design work, because according to Brown and Bond (1995), "the gap model is one of the best received and most heuristically valuable contributions to the services literature".

Drawing from different cases (oa from the food industry and health-insurance) we demonstrate how:

1. The model draws attention to the role of multiple stakeholders in service
2. Gap1, which is sometimes called the 'Listening Gap', is the conceptual reason of the success of qualitative and ethnographic research is service design.
3. Gap2 represents the core of the discipline of service design.
4. Gap4 is a valuable source of design challenges: What (over)promises are made in advertising that need to be matched by a adequate service design.
5. related to Gap6; How this misunderstanding gap can be closed through the co-creative service design process.

6. Gaps 3 and 7: represent the human resources and change management challenges for service designs.

2 Take home

Although few service designer believe they work in isolation, the case studies and gap model presentation will clarify the reach of their work and how they can draw from other services practices to improve their work and impact.

Knowledge of this classic and widely adopted model will help designers better represent the value of their process, tools and their work with other service related disciplines.

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The concept of on-going interactions in co-design: Insights from three different disciplines

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Abstract

Co-design with the customer is identified as an effective opportunity for service design and service innovation. By reviewing the different streams of marketing, design and service innovation with emphasis on user involvement, this paper proposes a multi-disciplinary framework for mutual learning and co-design. It is suggested that the firm can use on-going interactions with customers during the value generating process to create a space for mutual learning and co-design in which the customer becomes an integrated part of the innovation and design process not only as an informant but also as a co-designer.

KEYWORDS: co-design, service logic, service design, service innovation, concept of interaction

Introduction

To date service design is understood as a collaborative and multidisciplinary activity that crosses marketing, operations management, human resources, technology and design disciplines (Kimbell & Seidel, 2008; Ojasalo, 2009a; Sangiorgi, 2009; Ostrom et al., 2010). Similarly service innovation is viewed as cross-linking and multidimensional in its characteristics rather than restricted to technological innovation and the R&D department (den Hertog & de Jong, 2007; den Hertog et al., 2010). In this interactive and crosslinking context, the awareness of user integration as a co-designer rather than merely as an informant is increasingly discussed as an effective option for service design and innovation (Magnusson et al., 2003; Kristensson et al., 2008; Ojasalo, 2009b). However, there is still lack of integrated research around service design and service innovation. This lack is attributed to two reasons: (1) the historic focus and long tradition of physical product design (Ostrom et al., 2010) and (2) academic silos cause gaps between academic disciplines such as information technology, marketing, operations management, human resources and engineering (IfM & IBM, 2008).

Apart from the lack of research in the areas of service design and innovation, the adoption of service logic substantially changed the conceptualisation and operationalization of services (Vargo & Lusch, 2004a; 2008b). Service logic focuses on how value is created by the customer and how the firm can support the value generating process as value facilitator or value co-creator (Grönroos, 2008). Thus, the traditional distinction between services and goods is no longer relevant for design and innovation. Instead of developing products and systems that maximize the exchange of value, the focus of service design and innovation lies on value-in-use. Thereby, the firm's on-going interactions with the customer enable possibilities not only for co-creation of value but also for co-design.

To gain a better understanding of how co-design with the customer may be integrated into service practices, processes and systems, this paper takes an interdisciplinary perspective and reviews the different streams of marketing, design and service innovation with focus on user involvement. We, thereby, identify commonalities between service design and innovation to show how the knowledge of non-designers can be utilized for co-design. Based on this intuition we suggest a framework, which proposes that firms should use the interactions with the customer during the value generating process to generate more innovative solutions. The firm in its role as value co-creator offers a space for mutual learning, which enables the utilization of non-designer knowledge for co-design.

Early studies on customer involvement in service innovation have emerged during the last decade, however future research is still required particularly in regards to (1) the involvement of customers in collaborative innovation processes, (2) the development of collaborative relationships, (3) the stimulation of new thinking, creativity and service innovation, and (4) the alignment of organization structure, customer and supplier relationships with service innovation (Alam, 2002; Matthing et al., 2006; Ostrom et al., 2010). Similarly in the context of service design, Ostrom et al. (2010, p.17) noted a lack of scholarly and managerial understanding of "Integrating 'design thinking' into service practices, processes, and systems" and "Learning systematically about how to best engage customers and employees in collaborative service design". This conceptual paper takes a first step by providing a multi-disciplinary view of co-design to facilitate a cohesive understanding of the origin and application of co-design as well as to identify avenues for future research.

Literature review

We suggest three streams that shaped service design and service innovation towards a collaborative and multidisciplinary activity: (1) service marketing particularly since the paradigm shift from goods-dominant logic to service-logic or service-dominant logic (Grönroos, 2006a; Vargo & Lusch, 2008b); (2) design and the changing landscape of human-centred design towards user-centred design and co-design (Sanders & Stappers, 2008); and (3) new service development (NSD) and service innovation with focus on user involvement (Alam, 2002; Ojasalo, 2009a). The following review describes how these academic strands share a common ground in viewing co-design as a central part of service design.

The transition to service logic

The emergence of service logic in marketing had a significant impact on the understanding of how firms interact with their customers. Traditionally, marketing was described as one organizational function with value-in-exchange being the central concept (Hunt, 1976). By contrast, service logic understands marketing as a customer focus that permeates organizational functions and value-in-use perspective as the key construct (Grönroos, 2006b). In the following, we describe how the shift towards a new marketing understanding opens opportunities for mutual learning experiences with the customer.

In its traditional role, marketing acts as a bridge between production and consumption: the firm provides its customers with goods as input resources while marketing as an organizational function creates, communicates and delivers value to customers. Thereby, the 4Ps namely product, price, promotion and place optimise the value-of-exchange. During the last decade, however, Grönroos (2006a; 2006b; 2008) as well as Vargo and Lusch (2004a; 2004b; 2008a) have proposed service logic as the dominant logic in marketing. According to Vargo and Lusch (2008b) and Grönroos (2006a; 2008) the adoption of service logic as the dominant logic led to two fundamental shifts in marketing: (1) the shift in focusing on resources rather than products with particular emphasis on operant resources and resource integration, and (2) the shift toward value-in-use rather than value-in-exchange. From this perspective it was noted that marketing should be much more concerned with dealing with the interactions in a dynamic environment where the value of resources is not given but needs to be developed.

Building on resource-based view, service-dominant logic distinguishes between operand and operant resources (Vargo & Lusch, 2004a). Operand resources describe resources on which an act is performed to produce an effect; operant resources on the other hand are defined as invisible, intangible, dynamic and infinite resources that act on operand or other operant resources (Constantin & Lusch, 1994; Vargo & Lusch, 2004a). While traditional marketing models treat customers as operand resources that can be segmented, targeted and manipulated by adjusting the marketing mix, service-dominant logic sees customers as operant resources that are endogenous to the value-creation process (Vargo & Lusch, 2008b).

The operant resource view describes co-creation of value through resource integration instead of resource depletion (Vargo & Lusch, 2008b). According to service logic, firms and customers mutually create value (Grönroos, 2011). In this context, the firm represents (1) the value facilitator by providing customers with a foundation for their value creation in form of resources and (2) the value co-creator during interactions with customers during their value generating processes (i.e. consumption). The customer on the other hand is (1) value creator during the value-generating process (consumption) where other resources could additionally be added (e.g. skills) and (2) value creator through value-supporting interactions with the firm during the actual value fulfilment (Grönroos, 2008). This joint value creation results from interactions where the customer influences the firm's processes by participating as co-

producer of resources and the firm influences the customer's value creation as co-creator of value (i.e. value-in-use) (Grönroos, 2011).

In value co-creation, interactions between the firm and its customers form an integral part of a service. Firms are no longer restricted to insinuate value but also have the opportunity to actually influence the value fulfilment (Grönroos, 2008). In general terms, interactions can be described as “mutual or reciprocal actions where two or more parties have an effect upon one another” (Grönroos, 2011, p.244). Thus, interactions become a key marketing concept as it enables firms extending direct influence of customers' value fulfilment (Grönroos, 2008).

Joint value creation and co-creation of value cannot take place, unless interactions between the firm and the customer occur (Grönroos, 2008; 2011). In its traditional function, the marketing department may not be able to support the customers' value-creating processes or take responsibility for the fulfilment of value propositions because related processes will not be part of the marketing role (Grönroos, 2006b). Hence, individuals, systems and processes involved in both communicating value propositions and providing value support to customer processes should take a customer focus in their planning and operations (Grönroos, 2006b). Accordingly, Gummesson (1987) distinguished between part-time marketers and full-time marketers, i.e. customer focus should be part of every department function even when only marginally involved in customer processes. Thus, when accepting interaction concept as key construct and marketing as an intertwined function, we emphasise the following premise of service marketing:

P1: To enable co-creation of value, firms should take a customer focus throughout the organization and define their employees and customers as central assets.

Service Design

Taking this a step further, both, service logic and the central role of customers suggest a change in the scope of service design from ‘user-centred design’ to ‘co-design’ (Sanders & Stappers, 2008). User-centred design frames problems and opportunities from a human-centred perspective by including customer observation and information into the design project (Moritz, 2005; Krippendorff, 2006; Brown, 2008). Co-design on the other hand can be described as the collective creativity of designers and participants not trained in design, working together throughout the whole span of a design process (Sanders & Stappers, 2008).

Collective creativity, however, requires changes in the firm. As outlined by Burns et al. (2006), design traditionally focused on giving form. However, the on-going progress of design towards co-design splits the traditional view of design between ‘traditionalists’ and ‘transformers’. Transformation design is known for continuously transforming the behaviour of organizations and users rather than giving form to a design object (Burns et al., 2006). Indeed, recent literature suggests that instead of distinguishing service design from product design as a way of designing intangibles such as systems and processes, service design follows increasingly the path towards transformation design (Kimbell, 2009; Mager, 2009; Sangiorgi, 2009; Ostrom et al., 2010; Stickdorn & Schneider, 2010).

In the context of transformation design, co-design does not refer to the design of a particular object but rather to behavioural shaping of systems, interactive platforms and people's roles towards a more collaborative, sustainable and creative society and economy (Burns et al., 2006). In other words co-design as collective creativity and mutual learning experience requires changes in the landscape of business practice to achieve successful user involvement in service innovation. As such, co-design includes an exploratory and continuing activity or what Stickdorn and Schneider (2010) and Ostrom et al. (2010) describe as “Design Thinking” embedded in the firm's culture and systems. These developments

towards an exploratory and collective activity go beyond the boundaries of design, which leads to the following service design premise:

P2: Co-design requires the embedment of “Design Thinking” into a firm’s culture, systems and interactions for successful integration of users in service innovation.

Service Innovation

Active user integration is increasingly recognized as key for staying innovative and competitive in the market (Alam, 2002; Kristensson et al., 2008; den Hertog et al., 2010; Ostrom et al., 2010). Early approaches to integrate user input into product development processes were ‘lead user analysis’ (von Hippel et al., 1999; Lilien et al., 2002), ‘information acceleration’ (Urban et al., 1997), ‘beta testing’ (Dolan & Mathews, 1993), ‘consumer idealized design’ (Ciciannelli & Magdison, 1993) and ‘quality function deployment’ (Griffin, 1992). Further, studies of technology-based service innovation revealed that innovation with customers lead to more innovative services but at the same time indicated that successful customer involvement requires several strategies, such as the provision of necessary information and tools, heterogeneous groups and motivations that are personally meaningful to the participants (Magnusson et al., 2003; Matthing et al., 2004; Kristensson et al., 2008). Moreover, by recognizing that interactions with customers provide opportunities for value co-creation, service innovation has changed its scope by introducing collective creativity and mutual learning experiences (Kristensson et al., 2008; den Hertog et al., 2010; Ostrom et al., 2010). Hence, similarly to the intertwined role of marketing, service innovation goes beyond technological innovation and R&D (den Hertog et al., 2010).

Service innovation is a difficult construct to analyse and measure (Gallouj & Weinstein, 1997). These difficulties derive on the one hand from innovation theory that has been developed on the basis of technological innovation in manufacturing activities (Gallouj & Weinstein, 1997) and on the other hand due to the multidisciplinary and crosslinking characteristics of service innovation (den Hertog, 2000). Den Hertog and de Jong (2007) for example suggested that service oriented firms are inclined to invest more in organizational innovation or ‘unlocking innovation strategies’ rather than in technological innovation which is restricted to R&D.

To gain an understanding of how organizational innovation is implemented in practice, den Hertog and de Jong (2007) investigated a worldwide operating human resource service firm as case study. The authors found nine features of organizational innovation which they clustered into three categories of innovation: (1) ‘non-formalized strategic focus’, (2) ‘semi-structured organization’ and (3) ‘embedded decision-making’ (den Hertog & de Jong, 2007). Among these nine features, particularly the adaptation of an open innovative culture including the development of a bottom-up structure and flat hierarchy as well as ad-hoc co-innovations with international clients and partners were identified as basic requirements for corporate innovativeness (den Hertog & de Jong, 2007). These findings indicate that innovation should not be restricted to one department but rather particularly include frontline staff and external stakeholders.

By defining service innovation as a multidisciplinary and crosslinking activity, den Hertog (2000) proposed a four-dimensional model which focuses on the significance of non-technological factors in innovation. These four dimensions are (1) new service concept, (2) new client interface, (3) new service delivery system and (4) technological options. Den Hertog (2000) suggested that in addition to knowledge exchange within the four dimensions, process-oriented and intangible forms of knowledge flows between the dimensions and with stakeholders are crucial for service innovation.

The four-dimensional model was extended to a six-dimensional model by including (5) new business partner and (6) new revenue model (den Hertog et al., 2010). Moreover, by drawing on the resource-based view, den Hertog et al. (2010) proposed that a dynamic capability perspective might be a useful approach as service innovation is less tangible and more interwoven with a series of capabilities throughout the organization. One of the identified capabilities is ‘co-producing and orchestrating’, i.e. the firm has to co-design and co-produce a service innovation with other suppliers and to manage the accompanying alliance (den Hertog et al., 2010). Hence, although the described model was suggested in a business-to-business context, the high potential of customer integrations in innovation was clearly recognized. The following premise reflects that customer integration is a key determinant of innovativeness:

P3: Due to the recognition that active user involvement is effective in service innovation, firms should use interactions with the customer not only for value co-creation but also for co-design.

The concept of on-going interactions in co-design

Building on the interaction concept, Grönroos and Ojasalo (2004) suggest that the development of service productivity should be a mutual learning experience where the customer and service provider interact to create a common field of knowledge regarding how to consume and produce the service. In particular, Grönroos and Ojasalo (2004) propose that through on-going interactions or relationship continuity the customer gains more experience of the service provider and service processes, whereas the service provider learns more about the customer’s competence as well as the customer’s specific needs. Relationship continuity is argued to lead to improved internal efficiency as the service processes can be more effectively aligned to the customer needs as well as to improved external efficiency as the perceived service quality for the customer increases (Grönroos & Ojasalo, 2004).

It is suggested that firms should use the on-going interactions with the customer during the value generating process to create a space for mutual learning and co-design (figure 1). This space is seen as a ‘knowledge exchange platform’ to enable co-designing better value propositions for the firm (internal efficiency) as well as improved value-in-use for the customer (external efficiency). We therefore propose that firms should develop relationship continuity by providing such a platform to tap into customer knowledge and creativity with the aim of co-designing improved and innovative services, which ultimately leads to more efficiency for the respective firm as well as to more desirable and useful solutions for the customer.

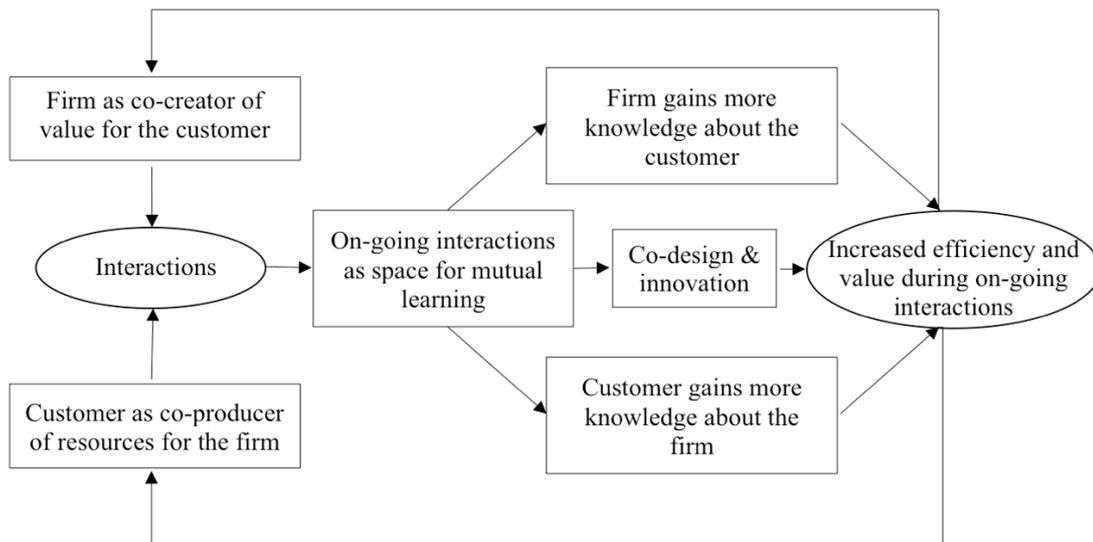


Figure 1 On-going interactions as space for mutual learning and co-design;
source: developed by the authors.

We propose that on-going interactions provide opportunities for mutual learning and co-design in which the customer becomes an integrated part of the innovation and design process not only as an informant but also as a co-designer. To achieve the active integration of users in service design and innovation, however, the firm needs to facilitate the conditions such as an open innovative culture, bottom-up structures and flat hierarchies as well as define their employees and customers as central resources of the firm. Accepting these premises and defining interactions as key construct for mutual learning relationships, our proposition is:

Firms can utilize on-going interactions with its customers for more intensive participation and knowledge exchange and for creating a space for mutual learning and co-design.

Conclusion and directions for future research

Co-design is argued to be an integral part of service design and a key determinant of innovation. Both service design and service innovation are recognized as being crosslinking and multidisciplinary in their characteristics rather than restricted to one department. Building on service logic as dominant logic for marketing, it is suggested that the firm can use the interactions with customers during the value generating process to create a space for mutual learning and co-design. It is furthermore proposed that co-design requires the incorporation of “Service Design Thinking”, by adopting open and innovative culture, bottom-up structure and flat hierarchy.

We recognize that the need for effective relationship continuity between the firm and its customers, and the opportunity it could provide for co-design, is a fundamental move toward more innovative services. However, we acknowledge that this paper represents a very early step of how co-design with the customer may be integrated into service practices, processes and systems. The suggested premises presented in this paper offer avenues for future research. Beyond the presented intuition here lies the task of practical implementation. That is, where exactly does the ‘space’ for mutual learning and co-design take place and exactly what is created through the process? Future research might also

consider the examination of different processes of customer involvement and collaborative relationships with emphasis on exploring new paths to creativity and innovativeness. Moreover, the effect of organizational structure on relationship continuity and service innovation by investigating different organizational structures and forms of relationships offers another avenue for future research.

Particularly within the service design literature, co-design is a concept that may contribute greatly to integration between research and practice. Practical techniques such as visualization methods for example play a key role in developing effective communication and transforming ideas and processes into visible dimensions, and thereby creating greater clarity for all stakeholders involved in the co-design process (Mager, 2009; Segelström, 2009). Thus, research could aid practising service designers in examining the effectiveness of visualisation techniques in the service-design process.

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Value co-creation in early stage new product-service system development

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Abstract

The need to develop systems that comprise medical equipment and services to improve healthcare service efficiency and availability has become a pertinent concern in developed countries, as governments continue to focus on controlling healthcare expenditure. This research intends to explore value co-creation with multiple stakeholders at early stage new product-service system (PSS) development in regulated industries such as the medical equipment industry.

This paper identifies the literature gap of stakeholder involvement in the process of new PSS development and compares the identified gap with the experience of industry practitioners. The fields relevant to the research focus are described and the characteristics of a new PSS are proposed as the basis of the research. This paper concludes with an initial proposition, that there is a need for an holistic approach to new PSS development and to have early multiple stakeholder input.

KEYWORDS: new product development, new service development, product-service system, value co-creation, stakeholder involvement

1 Introduction

The medical equipment industry is large and growing with a market size of over \$300 billion internationally (Hansen, 2009). Three of the five largest medical equipment markets in the world are in Western Europe, namely Germany, France and the United Kingdom. Despite weak economic growth, on average, leading markets in Western Europe have a forecast of 3.4% compound annual growth through to 2016. On the one hand, an aging population in developed countries would likely sustain this growth. On the other, governments in developed countries such as the United Kingdom are focusing on containing healthcare costs. This may motivate hospitals to invest in efficient healthcare services (Espicom Business Intelligence, 2011). Medical equipment manufacturers who provide services on top of designing and making equipment may be in a position to help.

The primary motivation of this research is to address a perceived need for an holistic approach to new product-service system (PSS) development in the medical equipment industry, which will be elaborated in the following two sections. In this research, PSS refers to the integrated solution that is “a marketable set of products and services capable of jointly fulfilling a user’s need” (Goedkoop et al., 1999: pp.18). In this paper the literature on PSS development is summarized, and preliminary findings from exploratory interviews with practitioners reported. The research focus, approach and intended contributions is then summarized, highlighting the research gap being addressed.

2 The literature gap

A review of literature has highlighted the importance of taking an integrated approach to developing complementary products and services, and of involving customers early in the development process. In this section, the literature on new product-service system development and stakeholder involvement is reviewed, highlighting the gaps in the literature.

New development process – product, service and PSS

New product development (NPD) is a well-researched field. Starting from the 1980s, much effort has been spent in the structuring and improving of the idea-to-launch process (such as Booz, Allen, & Hamilton, 1982; Cooper, 1988, 1993, 2008), as well as the identification of NPD success factors (such as Cooper & Kleinschmidt, 1987, 1995). Screening and selection of NPD ideas is another popular research area. Methods have been proposed for the evaluation, prioritization and portfolio management of NPD projects (such as Lint & Pennings, 1999; Cooper et al., 2001; Fredberg, 2007). How internal and external factors may impact the choice of NPD processes and tools has also been examined (such as Tidd & Bodley, 2002; Iamratanakul et al., 2007).

NPD studies have been extended to new service development (NSD) research since the late 1980s. However, instead of proposing NSD frameworks, most of these studies focused on examining the similarities between factors contributing to new products and new services success in various industries (such as de Brentani, 1989; de Brentani & Cooper, 1992; de Brentani & Ragot, 1996). In the 1990s, researchers enlarged the scope of NSD research from service feature to service delivery processes, and explored the interaction between service providers and customers in value co-creation (such as Edvardsson & Olsson, 1996; Johne & Storey, 1998). In terms of involving customers in the development process, Alam & Perry (2002) have proposed a framework for financial service products. However, NPD and NSD comparison studies continued into the mid-2000s (such as Nijssen et al., 2006), before the interest in new PSS development began.

From the mid-2000s, high-level frameworks for new PSS development have been proposed. Most of these are built upon models and techniques developed for NPD, NSD and technology management. Theories and practices in engineering and marketing disciplines are drawn on. For example, An et al. (2009) adapted the 1960’s product design approach of quality function deployment (QFD) (Akao, 1990) to develop an integrated product-service QFD for the mobile communications industry. Shimomura & Arai (2009) have extended Shostack’s (1984) service blueprint for early stage service design, with the enablement of Service Computer-aided design (Service CAD) software. Juehling et al. (2010) borrowed ideas from technology roadmapping (Phaal et al., 2004) and service engineering (Tomiyama,

2001), and proposed a staged development process for automobile after-sales service products. In addition, Yang et al. (2010) utilized the e-commerce lifecycle model for new PSS development.

In spite of the growing interest in a systematic approach to service development, with the exception of a few studies (such as Hara et al., 2006; An et al., 2008), most proposed frameworks continue to treat products and services as separate components. Many of the proposed NSD process models are designed for stand-alone services – services that do not require customers to have the right-of-use of a product that can be stocked, such as investment advisory services and freight services (such as Alam & Perry, 2002). Otherwise, the models are designed for narrowly defined services that manufacturers provide as an extension, such as after-sales services (such as Aurich et al., 2008). For those that explored new PSS development, the proposals are too high-level to guide industrial practitioners (such as Kowalkowski & Kindström, 2009; Tan et al., 2009). In sum, the currently proposed frameworks fail to truly join the development of products and services as an integrated system in an holistic approach.

Stakeholders and new product/service development process

The concept of stakeholders has been explored since the 1960s (Freeman, 1984). Management, economics and policy literatures have examined the definition and classification of stakeholders (such as Freeman, 1984; Mitchell et al., 1997; Bryson, 2003). There have also been theories and methods proposed for the evaluation of the strength of stakeholders' preferences (such as Freeman, 1984; Bryson, 2003; Kipley & Lewis, 2008; Williams & Lewis, 2008), as well as processes proposed to integrate stakeholder interests into enterprise planning (Freeman, 1984; Bryson, 2003; Susniene & Vanagas, 2007a,b).

As this research intends to explore value co-creation with multiple stakeholders, that is not only those who have legitimate claims on the company (Donaldson & Preston, 1995), a more encompassing definition of stakeholders is more suitable. Therefore, Freeman's definition of stakeholders is adapted: stakeholders are any groups or individuals who can affect or are affected by the value of the new product-service system (Freeman's 1984: pp25). The concept of value is a well-debated topic that is beyond the scope of this paper. In short, for this research, the value of a product, service or PSS will be referring to its "value-in-use", which is the utility derived from the application of skills and specialized knowledge (Vargo et al., 2008) in the production and delivery of products and services.

With regards to the investigation of stakeholder involvement in NPD/NSD, most of the studies focused on one particular stakeholder group – the customers. At the strategic level, Moller et al. (2008) have proposed that 'congruence' of service innovation strategy between service providers and customers would most likely result in NSD success. Taking the perspective of the relationship between customers and manufacturers, Lagrosen (2005) has put forward an NPD model that varies the approach of customer involvement according to the depth of the customer-manufacturer relationship.

At the process level, there appears to be no consensus of how customer involvement impact on NPD/NSD success. Some researchers have shown that lead users' involvement is important for NPD/NSD success (von Hippel, 1976; Herstatt & von Hippel, 1992; Oliviera & von Hippel, 2011). Some others have found customer involvement improves internal operational measurements such as innovation speed and technical quality, but not market performance (Carbonnel et al., 2009). At the other extreme, a study in Russia has found that

customer involvement in NPD did not have any impact on the results (Smirnova et al., 2009).

Very few studies have examined the involvement of stakeholder groups other than customers in the NPD/NSD processes. Smirnova et al. (2009) have found that involving external research organizations is beneficial in their Russian case study. O'Sullivan (2006) have concluded that there is no best way to manage the interactions with suppliers, albeit supplier involvement in NPD is important.

Thus far, a review of stakeholder involvement literature has revealed a lack of studies in the accommodation of multiple stakeholder interests in the NPD/NSD process. Of the studies that have examined stakeholder impact on the development process, very few have investigated the involvement of stakeholder groups other than customers or lead users.

3 The industry view

A series of exploratory interviews using open-ended questions has been carried out. The primary aims of these interviews were to inquire about the practitioners' views of the manufacturer providing services and products, the need of an integrated approach to NPD/NSD and the involvement of stakeholders in early stage NPD/NSD. The interviewees work in various business lines of a global health care equipment manufacturer and service provider. They are approached for their direct involvement in developing new product, service or solutions in the past five years, and their general industry knowledge and management experience. Figure 1 summarizes the findings. The experience shared has covered PSS where the product element is equipment or software.

| Function / Role in NPD/NSD | Case Context | Practitioners' view on: | | |
|------------------------------|--------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| | | Manufacturer providing services & products | Need of an integrated approach | Stakeholders involvement in early stage NPD/NSD |
| Service Engineering | General view, not product/service specific | From packages of products and services, to an integrated product with embedded service features | One process, with service engineering being part of product engineering | Involve field service team (the internal customer) in product design discussion before the design is fixed |
| Software Service Engineering | General view, not product/service specific | Product and service teams work closely together to support the product lifecycle | NPD has review points with service engineering | Involve field service team who has direct customer contacts at an early stage to provide feedback to product features list |
| Product Marketing | General view, not product/service specific | From services that complement products, to solutions that contains products and services elements | Need to have a solution view | Involve both product and service management, marketing and sales at the early stage of idea conception and system features definition |

| | | | | |
|------------------------------|-------------------------------------------------|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Service Sales | General view, not product/service specific | The business is moving towards a service business | Much needed as NSD is more ad hoc than NPD | Consider at early stage the target market's demographic trends, environmental trends, regulatory, legislation, health & safety, etc. |
| Service Operations | Specific to a NSD that is embedded in a product | Offer services that differentiate and improve productivity | Design service features in new product | Involve service and product technical and engineering teams at the proof of concept feasibility |
| Service Design | Specific to a NSD that is embedded in a product | Develop services that has a market demand in order to stay competitive | NSD needs product engineering as the service features are integrated with the product | Involve development teams of different parts of the solution and the early adopters in the field service team at early stage |
| Service Technology | Specific to a NSD that is embedded in a product | Take advantage of an existing capability and include service as part of the portfolio to differentiate | Important to involve product engineering in NSD as service and product features are integrated | Involve service marketing, service management early and product engineering (subject matter experts) earlier and deeper |
| Product Engineering | Specific to a NSD that is embedded in a product | Take the view of product life-cycle cost, promote the importance of service features in products | Product engineering takes a driving role in NSD | Product engineering to take a more aggressive role in NSD, and involve field service team to identify needs |
| Software Product Engineering | Specific to a NPD that is part of a PSS | No comment on this aspect | Use cross-functional teams including marketing, sales and services | Involve marketing, product management and visionary customers at early stage |
| Solution Development | Specific to a new PSS development | No comment on this aspect | Service is enabled by product (a technology) in the solution developed | Involve patients, customers, customer leadership, company's commercial and technology teams early |

Figure 1 Responses from exploratory interviews (April - September 2011)

Responses from the exploratory interviews support the need for an holistic approach to new PSS development. Moreover, the interviewees have repeated the importance of including interests from multiple stakeholder groups, not just the customers, at an early stage of the development. Most of the interviewees commented that certain stakeholder group(s) should have been involved earlier or deeper in the development process, revealing the practical need for improvement in early stakeholder input in new PSS development. Furthermore, the interviews have provided some insights into how different the opinions are with regards to the manufacturer providing services in addition to products. Although the interviewees are from different business segments and geographical regions, these initial findings may be limited to this manufacturer.

4 Research focus, approach and intended contributions

This sub-section first presents the research focus and unit of analysis, which is then followed by the approach and intended contributions.

Research focus and unit of analysis

The literature contributing to the area of multiple stakeholder engagement in a new PSS development process comes not only from several different fields of study. The following fields are identified: NPD/NSD process, servitization/product-service system (PSS), marketing and strategy. Figure 2 captures some examples of the relevant literature within each of the four fields, and their contributions in the context of this research interest.

| Field | Examples of relevant literature | Main contributions in the context of this research interest |
|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NPD / NSD process | Booz, Allen, & Hamilton, 1982 Cooper, 1993 Johnson et al., 2000 Alam & Perry, 2002 Tidd & Hull, 2003 | Standard process frameworks in NPD/NSD Insights into the evolution and motivations of NPD/NSD processes |
| Servitization / product-service system (PSS) | Chase & Garvin, 1989 Goedkoop et al., 1999 Davies et al., 2006 Baines et al., 2009 Ericson & Larsson, 2009 | Rationales for servitization Definitions of PSS Proposals of transition strategies for manufacturers |
| Marketing | Webster & Wind, 1972 Lovelock, 1983 Shostack, 1984 Anderson & Narus, 1995 Vargo & Lusch, 2004 | New definitions for service The concept of value-in-use How companies could approach new service design |
| Strategy | Mendelow, 1983 Vandermere & Rada, 1988 Porter, 1996 Kim & Mauborgne, 1997 Mitchell et al., 1997 | Theoretical perspectives of how stakeholder interest might influence a company's strategic planning Tools in strategy formation and stakeholder analysis |

Figure 2 Examples of relevant literature

Figure 3 depicts where the focus of this research lies, which is within the intersection of these fields represented by a four-corner star in the diagram.

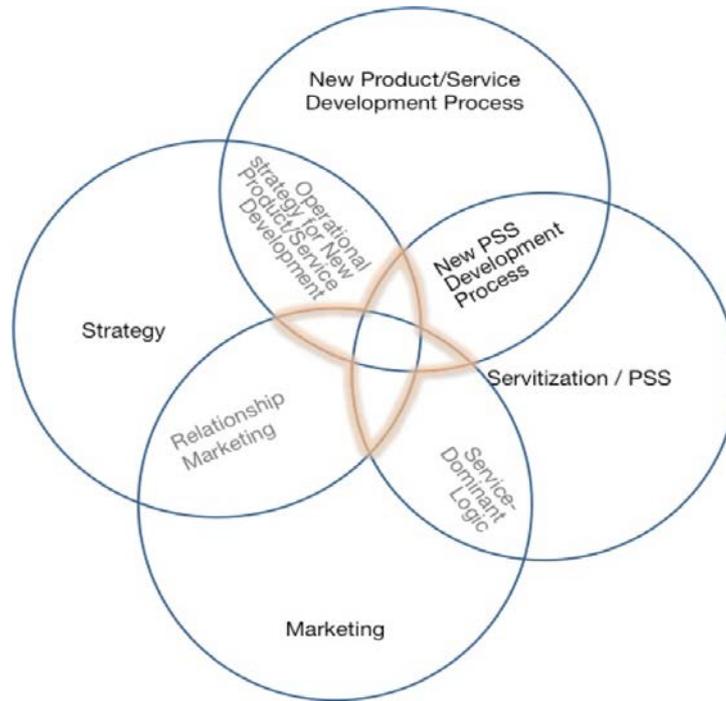


Figure 3 Relevant fields and research focus

The unit of analysis in this research is the “System / Offering”, which is shown in *italics* in Figure 4. As seen in Figure 4, the factors influencing the requirements of the system/offering are: the environment, the interested parties, the system/offering itself, and its product and service delivery components.

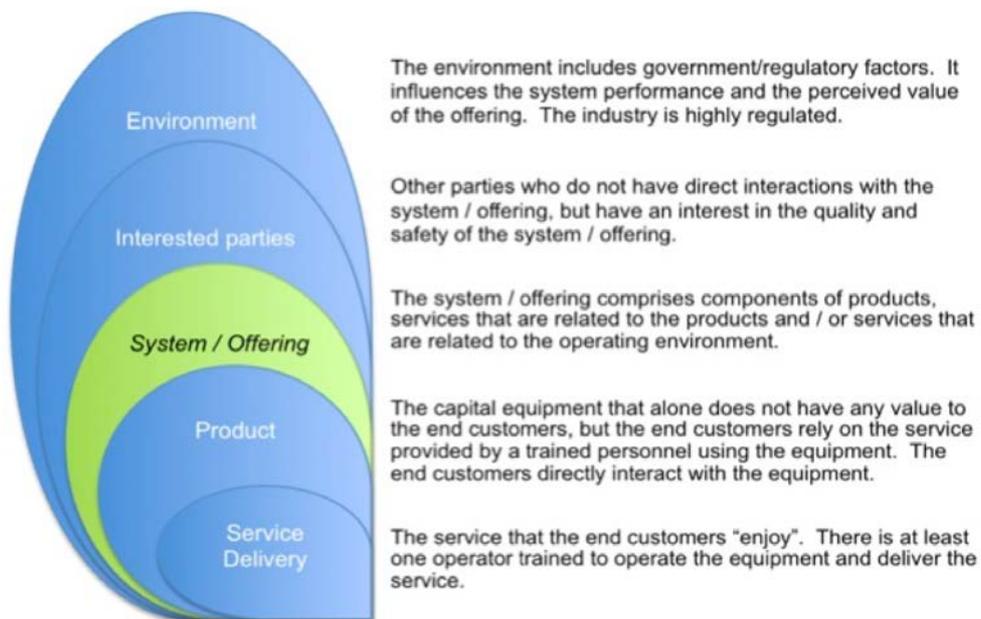


Figure 4 Characteristics of factors influencing the unit of analysis

Based on the initial review of NPD/NSD literature (such as Cooper, 1993; Johne & Storey, 1998), the process of NPD/NSD could possibly be generalized into five stages: ideation, feature design, development, testing and launch & post-launch review. The scope of this research is the second stage of “features design”, where stakeholder interests are transformed into feature specifications. Here, “transformation” is defined as the process of making sense, translating, prioritizing and incorporating stakeholder interest in the design and development.

Research approach and intended contributions

In order to collect information on the interactions among different stakeholder groups in the early stage new PSS development process, a case research approach is planned. Workshops and observation will be considered, supplemented by data from project documentation. Other case(s) from non-medical equipment industries may also serve as an early test for the generalizability of the research.

This research intends to contribute to the field of new product/service development in terms of how to co-create value with stakeholders by proposing an integrated process of managing stakeholder interest in early stage PSS development. It also intends to deliver practical guidelines for managers of new PSS developments in regulated environments such as the medical equipment industry. The study also aims to clarify the relationships among the factors influencing the requirements of a new PSS (system/offering).

5 Conclusion

This paper provides a summary of the perceived gap in the literature of NPD/NSD, PSS, marketing and strategy to address the need for managing multiple stakeholder interests in early stage new product-service system development in the medical equipment industry. Though limited to the experience within one global manufacturer, the initial exploratory interviews have provided support to the identified literature gap. This research intends to contribute to both NPD/NSD in terms of value co-creation with stakeholders, as well as to provide practical guideline to new PSS development managers.

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