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**Developing service innovations through
experimentation with help of service
prototyping space**

Master's Thesis

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Supervisor: Professor Eero Eloranta

Aalto University School of Science Degree Programme in Information Networks		ABSTRACT OF THE MASTER'S THESIS
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<p>A deeper understanding of how to meaningfully introduce the practice of iterative, rough prototyping, into service development would be beneficial in helping to create and manage innovative services. Being experimentation-driven is particularly important when the aim is to achieve disruptive innovations rather than incremental enhancements of current offerings. To date, knowledge required to put an experimentation-driven innovation approach into practice in the early phases of service innovation process is still not developed. The aim of this study is to further the development of that knowledge. The research questions of this study are as follows:</p> <ol style="list-style-type: none"> 1. What kind of process, techniques and practices can be used to prototype novel service propositions? 2. How could a service prototyping space support experimentation of service propositions? In which situations and how should it be used? <p>To address these questions, the thesis consists of a literature review, three action research cases, and development of service prototyping space construct. The literature review explores theories on how service can be designed and tested. Service as a design object is perceived from the perspective of service-dominant logic. In other words, service is typically defined as an interactive process between two service actors. The firms can only design and offer service propositions to facilitate and support the value creation of the customer during the service process. Experimentation is considered a way of figuring out what kind of value and experience the design will create.</p> <p>In the three action research cases, the experimentation process, the prototyping techniques, and practices are analyzed. Additionally, a service prototyping space concept is developed iteratively to support rough service prototyping. The difference between prototyping in the service prototyping space and in real service environment is considered as well.</p> <p>Based on results and conclusions drawn in this thesis, an action-based experimentation-driven innovation process model is presented. Furthermore, a tool is also created for selecting a suitable service prototyping technique in different situations.</p> <p>Analysis of the service prototyping space usage revealed five situations in which the service prototyping space supports the process. The main finding is that service prototyping space can be used to create the best guess for how the service works, so that the service experience and the value created is easier to validate in the experiment within the real service environment. The most important practices to support the prototyping are: setting deadlines and targets, creating clear hypothesis, narrowing the scope of ideation, parallel prototyping and documentation.</p>		
Keywords: service-dominant logic, service prototyping, novel service innovation, service prototyping space, service prototyping laboratory		

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<p>Kokeilemalla kehittäminen on erityisen hyödyllistä, kun haetaan toimialoja haastavia innovaatioita. Osaaminen nopeiden palvelukokeilujen toteuttamiseen on vasta kehityksessä. Palvelusektorin innovaatiotoiminnassa kokeileminen ei ole vielä yhtä yleistä kuin tuote-, vuorovaikutus- ja ohjelmistokehityksessä. Tässä tutkimuksessa selvitetään, kuinka palveluinnovaatioita voidaan kehittää kokeilemalla. Tutkimus pohjautuu seuraaviin tutkimuskysymyksiin:</p> <ul style="list-style-type: none"> • Millainen prosessi ja millaiset tekniikat ja käytännöt tukevat uudenlaisten palvelutarjoomien kehittämistä? • Miten palvelukokeilutila voisi tukea palvelutarjoomien kokeilemistä? Missä tilanteissa ja miten tilaa kannattaisi hyödyntää? <p>Tutkimus koostuu kirjallisuus- ja toimintatutkimuksesta. Kirjallisuustutkimus kokoaa olemassa olevan näkemyksen siitä kuinka palveluja suunnitellaan ja kokeillaan. Palvelu määritellään kahden toimijan väliseksi iteratiiviseksi prosessiksi. Palveluja ei voi tuottaa kuten tuotteita. Yritys voi suunnitella ja valmistella ainoastaan palvelutarjooman, jonka avulla se tukee asiakkaan palveluprosessia ja asiakkaan omaa arvontuotantoa. Kokeileminen on keino tutkia, millaisen arvon ja kokemuksen asiakas palvelusta saa.</p> <p>Toimintatutkimuksessa toteutetaan kolme innovaatioprojektia sekä kehitetään palvelukokeilutilan konseptia. Kunkin projektin kohdalla tutkitaan millaista innovaatioprosessia hyödynnetään, millaisia palvelukokeilutekniikoita käytetään ja millaisia kokeilua tukevia käytäntöjä voidaan löytää. Kokeilutilan tarkoituksena on tarjota turvallinen ympäristö nopeiden alkuvaiheen kokeilujen toteuttamiseen. Kokeilutilassa voidaan käyttää eri palvelukokeilumenetelmiä, kuten näyttelemistä, kuvakäsikirjoitusta sekä palveluympäristön rakentamista ja testausta. Kokeiluympäristöjen hyötyjen ja haittojen analysoimiseksi kokeiluja tehdään sekä palvelukokeilutilassa että oikeassa palveluympäristössä.</p> <p>Tutkimuksen tuloksissa esitellään kokeilemalla kehittämisen prosessimalli, jonka tueksi on kehitetty työkalu helpottamaan kokeilumenetelmien valitsemista erilaisiin kokeilutarpeisiin. Kokeilemalla kehittämistä tukevia käytäntöjä ovat esimerkiksi kokeilun takarajan määrittäminen, selkeän hypoteesin luominen, tavoitteen rajaaminen, rinnakkainen kokeileminen sekä analysoiva dokumentointi. Tutkimuksessa tunnistettiin viisi tilannetta, joissa palvelukokeilutila tukee innovaatioprosessia. Ennen kaikkea kokeilutilan tarkoituksena on auttaa suunnittelijaa määrittelemään paras arvaus siitä, miten palvelu toimii, jotta palvelukokemuksen ja arvontuotannon varmistamiseksi tarvittava kokeilu reaaliympäristössä olisi helpompaa.</p>			
Asiasanat: palvelukokeilu, toimialaa haastavat innovaatiot, palvelukokeilumenetelmät, palvelukokeilutila, palvelukokeilulaboratorio			

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This master thesis has been a great challenge for me. It has been long journey to the world of service design and innovation practice previously unfamiliar to me. Because the knowledge and practice of experimentation-driven innovation processes are still undeveloped and rather little discussed in the academic literature, I have had to learn it by doing; pushing the design team, including myself, towards the experiments. The praised learning by doing -methodology has been the way of working both in the empirical study and during the writing of this thesis. Yet it has been also fun journey – for instance I have had a change to develop nightclub concepts, organize parties and imagine the best ways to give immaterial gifts.

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Table of Contents

1	Introduction	1
1.1	Background	1
1.2	Research questions	3
1.3	Scope of the study	3
1.4	Research design	4
1.4.1	Interviews	5
1.4.2	Action research and observation	6
1.5	The structure of the thesis	6
1.6	Terminology	7
2	Literature review	9
2.1	The definition of service	9
2.1.1	Services as something which products are not	9
2.1.2	Steps towards service-dominant logic	11
2.1.3	Service dominant logic as the foundation of service theory	11
2.2	Service innovation	14
2.3	Service design	15
2.3.1	Principles of service design	16
2.3.2	Design process	17
2.3.3	Designing service propositions	18
2.4	Experimentation in innovation process	23
2.4.1	Experimentation process	24
2.4.2	Experimentation-driven innovation models	24
2.5	Service prototyping as means to experiment	26
2.5.1	Prototyping in general	27
2.5.2	Prototyping vocabulary	27
2.5.3	Attempts to define service prototyping	28
2.5.4	Holistic framework for service prototyping	29
2.5.5	Practical framework for prototyping	36
2.5.6	Good prototyping practices	37
2.5.7	Different service prototyping environments	38
2.5.8	Challenges in prototyping services	42
2.6	Summary of the literature review	43
3	Empirical research	45
3.1	Innovation cases as data set	45
3.1.1	Case 1: Rocking the nightclub industry	46
3.1.2	Case 2: Creation of the best park in the world	60
3.1.3	Case 3: Development of the immaterial shop	68
3.2	Cross-case analysis	79
3.2.1	Service prototyping space concept	79
3.2.2	Commonalities and differences of the cases	85
4	Conclusions and recommendations	99
4.1	The relationship between service as object of design and the experimentation process	99
4.2	Activity based experimentation-driven innovation process	101
4.3	The concept of the best guess	103
4.4	Service prototyping techniques	104
4.5	Good service prototyping practices	106

4.6 Applications for the service prototyping space	108
4.6.1 How could a service prototyping space support experimentation of service propositions?	108
4.6.2 In which situations and how should the service prototyping space be used?	110
4.7 Generalizability and limitations of the study	111
4.8 Further research agenda	112
References	114
Appendices	122
Appendix 1 Interview questions for design team members	122
Appendix 2 Pre-interview questions for case clients	123
Appendix 3 Pre-questionnaire for the case clients	124
Appendix 4 End result evaluation sheet for the case clients	125
Appendix 5 After the case interview questions for case clients	127
Appendix 6 List of explored service design techniques	128
Appendix 7 Descriptions of the service prototyping techniques	130
Cognitive walk-through	130
Sketching	131
Storyboarding	132
Scenario creation	132
Role-playing and improvisation theater	133
Body-storming	134
Service walk-through	135
Modeling and testing servicescape	136
Experience test	137
Appendix 8 Case videos	138
Appendix 9 A story on how service prototyping space concept was developed	139
The original space	139
The first development round	139
The first test and analysis	141
The second development round	142
The second analysis and testing phase	142
Third development round	143
Appendix 10: Prototyping exercises to facilitate service prototyping	144
4 Boxes – exercise for visualizing the service idea	144
Dream Theater-exercise	145
MINDwalk-exercise	145
Service mock-up building and body-storming in service prototyping space –exercise	146
Appendix 11 Prototype-analyzing sheet	148

List of Figures

FIGURE 1	TIMELINE OF THE RESEARCH	5
FIGURE 2	VALUE-CREATION PROCESS IN G-D LOGIC (ADAPTED FROM VARGO 2012)	10
FIGURE 3	SERVICE AND VALUE CREATION IN SERVICE-DOMINANT LOGIC (ADAPTED FROM GRÖNROOS 2011)	12
FIGURE 4	CONCEPTUALIZING SERVICE DESIGN (KIMBELL 2011)	16
FIGURE 5	TYPICAL ITERATIVE SERVICE DESIGN PROCESS (STICKDORN & SCHNEIDER 2011, PP. 126-135)	17
FIGURE 6	VISUALIZATION OF THE OBJECT OF SERVICE DESIGN (ADAPTED FROM EDVARDSSON & OLSSON 1996)	18
FIGURE 7	SERVICE CONCEPT LINKS THE STRATEGY AND CUSTOMER NEEDS (MEYER ET AL. 2002)	20
FIGURE 8	TYPICAL EXPERIMENTATION PROCESS (ADAPTED FROM THOMKE 1998, DAVENPORT 2009)	24
FIGURE 9	EXPERIMENTATION-DRIVEN INNOVATION MODEL VERSUS TRADITIONAL PLANNING-DRIVEN INNOVATION MODEL (ADAPTED FROM TUULENMÄKI & VÄLIKANGAS 2011; HASSI & TUULENMÄKI 2012)	25
FIGURE 10	CONCEPTUALIZATION OF SERVICE PROTOTYPING (BLOMKVIST 2011)	30
FIGURE 11	SUBJECT OF THE PROTOTYPE (HOUDE & HILL 1997)	31
FIGURE 12	LINKS BETWEEN DIFFERENT SERVICE PROTOTYPING PERSPECTIVES (ADAPTED FROM BLOMKVIST BY PASSERA, KÄRKKÄINEN & MAILA 2012)	35
FIGURE 13	THE PRACTICAL FRAMEWORK FOR SERVICE PROTOTYPING (PASSERA, KÄRKKÄINEN & MAILA 2012)	36
FIGURE 14	EXAMPLES OF IDEAS THAT SUPPORT MEETING NEW PEOPLE IN A NIGHTCLUB	48
FIGURE 15	PROTOTYPING OF NIGHTCLUB IDEAS IN AOBC SPACE	49
FIGURE 16	HOUSEPARTY SERVICESCENE CREATED IN THE PROTOTYPING SPACE	51
FIGURE 17	EXAMPLES ON HOW INFORMATION WAS BROUGHT AS PART OF THE SERVICESCAPE PROTOTYPE, ON LEFT THERE IS MENU BEHIND THE ASSOCIATE BAR AND ON RIGHT THERE IS BOOKING FORM FOR BLIND DATE	52
FIGURE 18	DESIGN TEAM BODY-STORMING THE BLIND DATING CONCEPT IN AOBC SPACE	52
FIGURE 19	"MISSION IMPOSSIBLE?" CARDS: UPPER PICTURE IS THE FINAL EXPERIENCE TEST PROTOTYPE, ON LEFT IS THE FIRST PROTOTYPE AND ON RIGHT THE SECOND PROTOTYPE	53
FIGURE 20	A PROTOTYPE DOCUMENTATION FORM	55
FIGURE 22	THESE TWO ACTIVITIES, A HUMAN LIBRARY (ON THE LEFT) AND ASSOCIATE GAME (ON THE RIGHT), WERE TRYING TO HELP PEOPLE TO FIND SIMILAR-MINDED AND INTERESTING PERSONS TO CO-OPERATE WITH	57
FIGURE 23	AN INVITATION EMAIL THAT CUSTOMERS COULD USE IN THEIR MARKETING	58
FIGURE 24	KITCHEN AREA IS THE HEART OF HOME PARTIES, THEREFORE IN THIS CLUB CONCEPT THE BAR SHOULD LOOK LIKE A KITCHEN	59
FIGURE 25	ONE GROUP OF CUSTOMERS STARTED THEIR OWN GAME DURING THE EVENING	59
FIGURE 26	THE KIOSK WORKED AS STORAGE FOR PARK ACTIVITIES AS WELL AS AN IDEA CHANNEL	62
FIGURE 28	THE HOT WATER TAB READY TO BE USED IN THE TERRACE OF THE CAFETERIA LOCATED IN THE PARK	63
FIGURE 29	PARK USERS TESTING THE HOT WATER TUB IN THE PARK	64
FIGURE 30	A PROTOTYPE OF AN ASHTRAY FOR PARK USERS	64
FIGURE 31	A PARK USER TESTING THE PAINTING EQUIPMENT	65
FIGURE 33	4 BOXES SKETCHING EXERCISE IN PROGRESS	70
FIGURE 35	FROM THE "CANDY" GIFT SHOP YOU CAN PICK UP THE IMMATERIAL GIFT IDEAS AS YOU WOULD PICK CANDIES AT THE CANDY SHELF	71
FIGURE 36	FROM THIS "TIMESHOP" YOU COULD BUY IMMATERIAL GIFT IDEAS THAT SAVE TIME, OR GIVE YOU QUALITY TIME	72
FIGURE 37	PROCESS FOR TESTING TWO PROTOTYPES IN ONE LOCATION	72
FIGURE 38	LOW VERSUS HIGH RESOLUTION PROTOTYPE OF IDEA TREE	73
FIGURE 39	A TEST CUSTOMER WRITING THEIR GIFT IDEAS ON A LEAF	74
FIGURE 40	A PARTNER ORGANIZATION REPRESENTATIVE TESTING THE "IDEA TREE" CONCEPT	74
FIGURE 41	CLIENT ORGANIZATION REPRESENTATIVES TESTING THE ELECTRONIC BOARD	75
FIGURE 42	THE IMMATERIAL SHOP CONCEPT	79
FIGURE 43	MEASUREMENTS OF THE AOBC SPACE	80
FIGURE 46	SIMPLE BLOCKS WITH WHEELS USED AS PARTITIONING WALLS	82
FIGURE 47	KNOWLEDGE GENERATED DURING THE INNOVATION PROCESS	86
FIGURE 48	DIFFERENCES OF THE PROTOTYPING TYPES	87
FIGURE 49	ROUGH IDEA PROTOTYPING OF THE MOVIE ON THE TERRACE IDEA	88
FIGURE 50	CONCEPT PROTOTYPING OF THE "TIME SHOP" CONCEPT IN AOBC SPACE	89
FIGURE 51	THE FIRST EXPERIENCE TEST OF THE MINDCLUB CONCEPT	89
FIGURE 52	EXPERIENCE TEST OF "TIME SHOP" CONCEPT LOCATED IN THE PREMISES OF THE PARTNER ORGANIZATION	90

FIGURE 53 CONNECTING THE EXPERIMENTATION PROCESS TO THE OBJECT OF DESIGN	100
FIGURE 54 ACTIVITY BASED EXPERIMENTATION-DRIVEN INNOVATION MODEL	101
FIGURE 55 STRUCTURE OF THE MOVABLE WALLS	140
FIGURE 56 EXAMPLE 4BOXES FORM	144
FIGURE 57 EXAMPLE MINDWALK QUESTION SHEET	146
FIGURE 58 EXAMPLE TIMETABLE FOR BUILDING A MOCK-UP AND BODY-STORMING SESSION IN AOBC	147

List of Tables

TABLE 1 PEOPLE INTERVIEWED DURING THE CASES	5
TABLE 4 THE POSSIBLE DIMENSIONS OF SERVICE PROTOTYPE	32
TABLE 5 SUM UP OF THE ACTION RESEARCH CASES	46
TABLE 6 PROTOTYPING PRACTICES UTILIZED IN NIGHTCLUB CASE	54
TABLE 7 PROTOTYPING PRACTICES UTILIZED IN PARK CASE	66
TABLE 8 PROTOTYPING PRACTICES UTILIZED IN IMMATERIAL SHOP CASE	77
TABLE 9 THE NUMERICAL RESULTS OF DESIGN ACTIVITIES	86
TABLE 10 ANALYSIS OF THE SERVICE PROTOTYPING TECHNIQUES	92
TABLE 11 HEURISTICS FOR CHOOSING A SERVICE PROTOTYPING TECHNIQUE BASED ON THE GENERAL PURPOSE OF THE PROTOTYPE	105
TABLE 12 CONNECTING SERVICE PROTOTYPING TECHNIQUES AND SERVICE DIMENSIONS	105
TABLE 14 HEURISTICS FOR CHOOSING THE PROTOTYPING ENVIRONMENT (PUBLISHED IN PASSERA, KÄRKKÄINEN & MAILA 2012)	111
TABLE 15 COGNITIVE WALK-THROUGH AS SERVICE PROTOTYPING TECHNIQUE	130
TABLE 16 SKETCHING AS SERVICE PROTOTYPING TECHNIQUE	131
TABLE 18 SCENARIO CREATION AS SERVICE PROTOTYPING TECHNIQUE	133
TABLE 19 ROLE-PLAYING AS SERVICE PROTOTYPING TECHNIQUE	134
TABLE 20 BODY-STORMING AS SERVICE PROTOTYPING TECHNIQUE	134
TABLE 21 SERVICE WALK-THROUGH AS SERVICE PROTOTYPING TECHNIQUE	135
TABLE 22 SERVICESCAPE MODELING AND TESTING AS SERVICE PROTOTYPING TECHNIQUE	136
TABLE 23 EXPERIENCE TEST AS SERVICE PROTOTYPING TECHNIQUE	137

1 Introduction

This study is part of the Act Out of the Box of Finland research project run by MIND-research group. The aim of the Act Out of the Box of Finland project is to lower the threshold of experimentation in the service innovation process. The ultimate goal of MIND is to make strategic innovations (Tuulenmäki & Välikangas 2011) happen systematically, and not by chance or luck. To promote a systematic process for strategic innovation, MIND focuses on two main points: first, increasing the quality of new business ideas, and second, lowering the threshold for starting to experiment and implement new business ideas. This study focuses on the latter by exploring the development of service innovations through experimentation.

1.1 Background

Service goes on everywhere, oftentimes unacknowledged. The percentage of workers employed in the service sector has steadily increased over the last three decades, both in Europe and the United States (US) (D'Agostino, Serafini, & Ward-Warmedinger 2006). In 2001, 69 % of total employment in EU came from services (D'Agostino, Serafini, & Ward-Warmedinger 2006). In 2006 in US, the figures were 85 % of employment, and 82 % of GDB (Tekes 2007). New technologies, like telecommunications, computers, wireless devices, and Internet service have opened new possibilities for providing services.

The competition in every field is harsh and every company desires to win the competition for customers. Every customer, in turn, wants to “get the job done” (Christensen 2005), which means to reach the goal they are pursuing at the time.

The challenge for a company is to generate understanding on customer needs to create corresponding value propositions that are superior to other alternatives as perceived by the customer (Strandvik, Holmlund & Edvardsson 2008). Some has managed to do this better than others, for instance, IKEA offers cheap furniture. Others do not even understand the outcome customers are looking for, or at least their service offering does not indicate that level of understanding. One of the examples of industries that fail in this is a nightclub industry. What might be the customer's goals when going to a nightclub? There are several answers depending on the person, but one of them will be meeting new people. How do current nightclubs support this? Not effectively; the consideration of the customers' goals is minimal or not at all. The one who creates an offering that truly manages to support meeting new people in a nightclub has potentially created an industry-changing innovation.

Disruptive innovation challenges the way of doing things in an industry; it changes the rules of game (e.g., Kim & Mauborgne 1999, 2005, 2009; Tuulenmäki & Välikangas 2011). It is argued, however, that creation of a novel combination of tangible and intangible elements, as well as operations and practices, cannot be planned or are not executable at the outset; they cannot be studied or analyzed into existence (Ries 2011, p. 37-55; Tuulenmäki 2010, pp. 19; Hassi & Tuulenmäki 2012). Instead experimentation is needed to learn what works through a trial-and-

error process (Thomke, Hippel & Franke 1998; Ries 2011, pp. 37-55). There is a need for a structured approach to capture knowledge of customers, because otherwise too much remains unknown about how the customers will react to, interact with, and accept the new service (Passera, Kärkkäinen & Maila 2012).

In the field of product development, the practice of iterative, rough prototyping has been seen as directly related to innovation (Blomkvist 2011; Passera, Kärkkäinen & Maila 2012). A deeper understanding of how to meaningfully introduce the practice of iterative, rough prototyping into service development would be beneficial for creating and managing innovative services, since prototyping allows for:

- Early user involvement (Brown 2008), which provides insights about what truly creates value for the user/customer.
- Lower project risks (Drews 2009) by pushing for early validation of solutions.
- “Thinking by doing” (Saloner 2011), which enhances ideation, and understanding of the design problem (e.g., Thomke 1998), and the sharing of abstract, intangible knowledge between stakeholders (Fraser 2009).
- Strengthening the belief of the creativity of the development team (Gerber & Carroll 2012).
- A sense of progressing forward within the developing team (Gerber & Carroll 2012).
- Higher quality services, better managed service engineering processes, etc. (Holmlid & Evenson 2007).

These aspects are particularly important when aiming for disruptive innovations rather than incremental enhancements of current offerings (Lee et al. 2004; Tuulenmäki & Välikangas 2011, Passera, Kärkkäinen & Maila 2012). Prototyping seems to offer an empirical, user-centered, and rapid solution, but it is a practice still not easily understood and applied in the service domain (Parker 2009).

It seems that developing service design methods builds mainly on individual efforts, and involves introducing one technique at a time, rather than draws an overview on the methodological toolbox or a unifying framework (Vaajakallio et al. 2009). Maffei, Mager and Sangiorgi (2005) call for studies that integrate tools and methods in to the practice of service development and practice of marketing and management of services. They consider that there is need for new framework for service innovation that merges the contemporary innovation theory with the models of user-driven design approach (ibid). This study tries to address some of these issues as well.

In this study, in fact, the experimentation-driven innovation model, a new approach for challenging the traditional planning driven approach, is applied in the service field. The study builds holistic and practical understanding of how experimentation can actualize in the innovation process by analyzing and exploring existing service prototyping methods and practices and applying them in action research innovation cases.

A new tool, service prototyping space, is developed to determine whether it helps to support the iterative, rough service prototyping. The hypothesis is that services, especially the ones depending on a physical location for their provision, would benefit from a safe space for prototyping in the beginning of the innovation process. This study seeks to understand the process, practice, and tools that can help in the early phase of the innovation process.

1.2 Research questions

This study considers the research problem of: “How to develop service innovations through experimentation?”

In unpredictable, complex, and unclear environments, it is more sensible to act into the future instead of plan into the future – to be experimentation-driven rather than specification-driven (McGrath 2010; Ries 2011, pp. 38, Tuulenmäki & Välikangas 2011). The knowledge on how to put an experimentation-driven innovation approach into practice is still not developed, however, and therefore is something that few companies are comfortable attempting. This study describes a practical process of prototyping service ideas and finding tools to support prototyping in early phases of service innovation process. The broad research problem is divided into two questions:

1. What kind of process, techniques, and practices can be used to prototype novel service propositions?
2. How could a service prototyping space support experimentation of service propositions? In which situations and how should it be used?

1.3 Scope of the study

In this thesis, the target of the innovation activities is not incremental changes in a current service system, e.g., the quality of service. The target is to find a novel service proposition and potential seeds of strategic innovations, including innovations that challenge the conventions of the industry (e.g., Markides 1997, 1999, Govindarajan & Gupta 2001, Tuulenmäki 2010).

The focus is on the early phases of the innovation process, including industry and customer analysis, idea exploration, and verification with experimentation until there is the formation of an industry-challenging concept with implementation ideas that will bring an intended value to the customer.

There exists various kinds of services, and to be able to draw some conclusions about the experimentation, there needs to be some categorization and a decision on service types.

First, from the choice between consumer-business versus business-to-business services, consumer-business is chosen. Second, consumer services can be categorized into location-independent services, like mobile apps, to location-dependent services like a golf course or traditional hotel (Lovelock 1983). According to Bitner (1992), location dependent services can be further categorized into self-service, interpersonal service, and remote service depending on who acts

in the location. In self-service, it would be the customer who acts while in remote-service, the service employee acts in the location. In interpersonal service both customer and service provider interact in the same service location (ibid). From these options, this study concentrates on interpersonal B-to-C services that are location-oriented.

There is a key limitation for this study, however. Because the focus is in experimentation practices, methods, and tools, the management and organizational structure or culture is not discussed in the study. While this exclusion is deemed to help maintain the focus of the research effort of this study, it is also potentially limiting in so far as the lack of discussion of management and organizational structure or culture leaves a sizeable gap in the research results.

1.4 Research design

The design of this research features a multiple case study that utilizes inductive theory building (Eisenhardt, 1989). The data is gathered from three cases that are individually analyzed and then compared across to create answers to the research questions.

As Eisenhardt (1989) suggests, the cases should be chosen for theoretical reasons, not with random or statistical sampling. These cases are chosen from innovation projects done in the MIND research group that utilized experimentation as a key driver of the innovation process. Because the aim is to understand how the experimentation environment affects to the process, the cases were selected so that different experimentation environments are utilized within cases. The unit of analysis is a single innovation project.

To develop a concept of the service experimentation space and research the utilization of it as an experimentation environment, an initial construct of the space is created in the beginning of the study and iteratively developed within the cases that utilize the space. In theory, in the process of building case studies, it is recommended that there is an overlap in data analysis and collections (Eisenhardt 1989). This overlap enables the continuous development of the space construct. Figure 1 visualizes how the case studies and development of the experimentation space concept overlap and considers a likely timeline of the research.

Theory building cases studies are suggested to use multiple data collection methods (Eisenhardt 1989). This study utilizes interviews, questionnaires, and observation and action research as data collection methods. In the innovation cases and prototyping space development, the researcher worked either as a designer or as a tutor of the design team.

First, the within case analysis is done for each innovation project. The results of the within cases analysis are presented in case findings in the chapter 3.1. The within case analysis is coupled with cross case analysis, chapter 3.2. The researcher also utilized categorizations of themes rising from the research questions and comparisons of the cases as analysis methods in the cross case analysis.

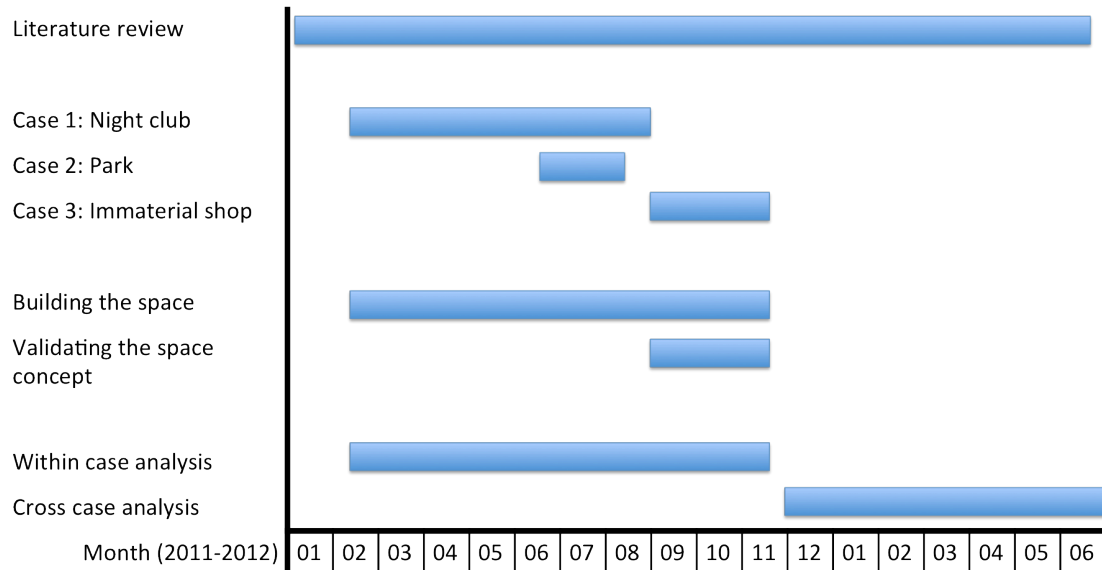


Figure 1 Timeline of the research

1.4.1 Interviews

The designers and the case clients' representatives were interviewed to gather data about the experiences of the process, tools, and practices used in the cases.

Most of interviews were executed as semi-structured interviews (Järvenpää & Kosonen 2003, pp. 24). Some of the open-end questions and topics were formulated in advance but otherwise the conversations were rather informal. In the third case, a pre-interview was conducted with a questionnaire, with the pre-interview information attached in Appendix 3. All together 12 interviews were conducted (see Table 1).

Table 1 People interviewed during the cases

Case	Design team (DT)	Clients (C)	Clients (C)
	After the case	Before the case	After the case
Nightclub	2 (DT_KH.1, DT_JT.1)	Client organization didn't exist	
Park	2 (DT_KH.2, DT_JT.2)	2 (C_TT.1, C_KimH.1)	2 (C_TT.2, C_KimH.2)
Immaterial shop	1 (DT_VS)	6	3 (C_MV, C_TK, C_K-L.H)

Design team members are interviewed after the case was complete so as to explore how they saw the experimentation-driven innovation process and gauge how they felt about it, and how they utilized the service prototyping space. The topics for designer interviews can be found in Appendix 1.

For those cases that have clients who initiate the projects, representatives of the clients were interviewed or surveyed before and after the case. Before the case, the aim is to map the expectations and previous experience on the

experimentation-driven innovation approach. Pre-interview topics can be found in Appendix 2 and the pre-questionnaire for the case 3 is presented in Appendix 3.

After the case the client representatives were asked to evaluate the results and the process, what they learned, and how they saw the experimentation as part of the innovation process. In the case 3, all the case clients filled the evaluation form for the concept, visible in Appendix 4 and three case client representatives were interviewed. The topics of after case interview can be found from Appendix 5.

1.4.2 Action research and observation

As an action researcher, the researcher participated in the innovation cases either as member of the design team (case 1, 3), or as tutor and observer of the design teams consisting of students and trainees (case 1, 2). Therefore the researcher had a chance to follow up on the cases and oversee data collection. Weekly the researcher participated and updated notes based on the discussions with the design team. The researcher also facilitated and observed prototyping sessions.

Additionally, the researcher designed the service prototyping space concept and iteratively testing and enhancing it.

1.5 The structure of the thesis

In the literature review, chapter 2, existing knowledge of service innovation and experimentation is reviewed. The first part of the literature review defines what a service is, what a strategic service innovation is, and how services are designed in general. Basically, this part defines the objective of innovation. The later part introduces the literature of experimentation and service prototyping, attempting to capture the current knowledge of what service prototyping is and what techniques, practices and tools are used in the field.

Chapter 3 presents the empirical study. It starts with describing the findings of the innovation cases. Case 1 challenges the nightclub industry, case 2 explores how the park could turn to be the best park of the world, and the case 3 creates a concept for a gift shop. Along with the innovation cases, a construct of the service prototyping space is developed and tested.

The empirical part is followed by cross-case analysis in chapter 3.2. The cross case analysis is divided in two subchapters: first presenting the concept for the service prototyping space and second discusses the commonalities and differences between cases.

Chapter 4 draws conclusions based on the findings of the research questions.

1.6 Terminology

A service: “Service” (singular) refers to a process of doing something for or with another entity. Companies cannot produce or design services, but they design service propositions that enable service to exist when a customer is utilizing it (Vargo & Lusch 2004a).

Service concept: The general description of the offering and the elements, which communicate the service itself (service brand, identity and mood), service concept can be seen as a mental picture of what the service is and how it is provided (Meyer et al 2002, Edvardsson & Olsson 1996).

Service evidence: Service evidence refers to the tangible touchpoints of the service such as commercials, posters, tickets, and bills, that are created in the design process to allow communicating and evaluating the concepts in advance (Shostack 1977).

Servicescape: The term servicescape refers to the physical surroundings that facilitate the provision of the service offerings to customers (Bitner 1992). For instance, in the bank, the entry, signs, furniture, room layout, and the whole decoration are part of the servicescape.

Convention: A rule or practice based upon general consent and upheld by society at large.

Execution idea, Implementation idea: An execution idea addresses on every practical level how to unlock the potential in the opportunity idea so that it creates value for customer and for the company. Execution ideas can include both larger ideas (such as an idea about the need that the business will serve) and smaller detailed ideas about how to execute an idea. (Hassi & Tuulenmäki 2012).

Experimentation: An iterative trial-error learning process. A form of problem solving that is a fundamental activity in innovation process. Experimentation can be considered as an umbrella term of different prototyping and modeling activities. (Thomke 1998).

Prototyping: Prototyping should be viewed as an activity or a mind-set utilized by designers where the aim is to test the hypothesis relating to a certain idea (Blomkvist 2011).

A prototype: An early embodiment, a representation, or a manifestation of an idea that is formulated in form of assumptions or hypothesis. Prototype is a medium to test an idea against specific criteria, so to see if the hypothesis holds true. (Blomkvist 2011).

Visualisations: Visualizations is a subset of prototypes. Visualizations are representations that are based on the visual acuity.

A mock-up: The term mock-up can be used to describe early, un-polished prototypes that have the appearance and can be used as means to explore the functionality (Moritz 2005).

Fidelity: A level way to assess how closely the prototype resembles a finished product (an artifact or service) and how much of the information or interactivity it portrays (Rudd, Stern, & Isensee 1996).

Resolution: The amount of details existing in the prototype (Houde & Hill 1997).

2 Literature review

The literature review gathers knowledge on service prototyping and experimentation. The aim is to figure out what kind of models and methods are important in developing service innovations.

The first subchapter defines what a service is. Second subchapter sets the target level for the design by describing what a disruptive service innovation is. The third subchapter describes how a designer or a company can design service propositions. The aim of these chapters is to give theoretical tools to understand what the object of design in this study is. The fourth subchapter reveals the role of experimentation in innovation processes. The fifth subchapter discusses how services can be experimented.

2.1 The definition of service

The debate over how to define service has raging on for decades. There has been a steep increase in service research in disciplines as diverse as economics, management, engineering, and design.

The definitions can be divided in two schools; those that base on good-dominant (G-D) logic and those that base on service-dominant (S-D) logic. Pointedly, G-D-logic sees services as different or even less-desirable forms of goods whereas S-D-logic changes the world upside down by framing that everything can be considered as service because all economic exchange, private, public and market exchange, are based on the logic of serving (Vargo & Akaka 2009). The current discussion of S-D is relatively young; Vargo & Lusch (2004a) published the formulation of S-D logic in 2004. The idea of S-D logic dates back to 1700s and partial pedigree for it can be detected from service research since the discussion of services started in 1960s (Vargo 2012). The importance of S-D logic was recognized quickly, and at the moment it is considered be a foundation for service theory (e.g., Lusch & Vargo 2006).

2.1.1 Services as something which products are not

The discussion of differences between goods and services started in the marketing field in 1970s, when researchers realized the economic value of services was beginning to increase rapidly. First, the discussion focused on mapping out differences between products and service, or defining services as something what good are not or as an additional offering to complement products (Vargo & Lusch 2004a). One of the widely known definitions for service is the IHIP-model (Zeithaml, Parasuraman & Berry 1985; Lovelock & Gummesson, 2004, Vargo & Lusch 2004b). According to it services are intangible, heterogeneous, inseparable and perishable (Zeithaml, Parasuraman & Berry 1985, Lovelock & Gummesson, 2004). Intangibility means that services cannot be seen, felt, tasted or touch in the same manner as goods can be sensed. Inseparability of consumption and production means that the services require the presence of the customer for the service to exist. Heterogeneity rises from the same situation; customers are involved and they are all different. The last characteristic is perishability, which

means that services in general cannot be stored in inventory as products are. (Vargo & Lusch 2004b).

From the first, the IHIP model had a lot of critics because the characteristics cannot be generalized across all services and some can be applicable to some goods too (e.g., Lovelock & Gummesson, 2004; Vargo & Lusch, 2004b). For instance, the result of a hair cut service lasts relatively long although the cutting action itself is not maintainable.

The value creation process (see Figure 2) in G-D logic reveals some problems too. According to Vargo (2012), the firm is responsible for creation of the value, creating the offering that the customer purchases with money or other goods. The customer's role is to deconstruct the value embedded in the good or 'service product'. If you think more carefully about why people buy products or service, there are some problems with this picture. One of the biggest problems in G-D logic comes from the fact that customers do not buy goods or services because of nature of them (Strandvik, Holmlund & Edvardsson 2008). One does not go to a nightclub just because one wants to go to a nightclub, but because they have some need that they believe the nightclub will offer a solution to. It might be a need for dancing, a need for meeting new people, or just a need for a place to hang out. People buy services because of the benefits they render (Vargo & Lusch 2004a; Strandvik, Holmlund & Edvardsson 2008). Goods-dominant logic does not take this into account.

Customer orientation helps to overcome the challenges of service production and marketing (Grönroos, 1989; Vargo 2012). Research around customer satisfaction, loyalty, needs, and wants emerged. New approaches, like 7Ps of marketing of services and customer relationship management were born (Grönroos, 1989). But still the role of the customer was secondary, compared to the firm. The firm was the one who created the value and delivered that to the customer. According to Vargo (2012), it is just an add-on to the previous situation.

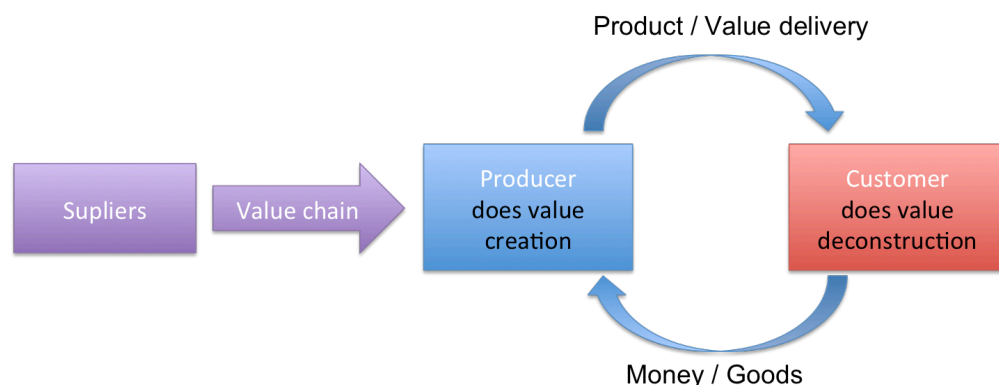


Figure 2 Value-creation process in G-D logic (Adapted from Vargo 2012)

2.1.2 Steps towards service-dominant logic

One of the challengers of the IHIP model was the process definition for services. Services were seen as a process where service provider and client are co-producing (Shostack 1977, Ramaswamy 1996) the value to the customer. Service was not seen as an output anymore but as a different kind of production form. Ramaswamy (1996) divided the activities of the process into two parts: “service operations activities, which reflect the steps needed by service providers to transform inputs into outputs, and customer service activities, representing the interactions between customers and service providers” (Ramaswamy 1996, pp. 28).

Products and services still had tight connection. It seemed to be impossible to process service without products. Already 1977, Shostack (1977) developed the concept of service evidence. Customers cannot experience them directly but only through their peripheral tangible clues (*ibid*). From this discussion, the definitions of service systems that require processes, products, performance, client(s), and the service personnel (Edvardsson & Olsson 1996; Holmlid & Evansson 2007) were born. Edvardsson and Olsson’s (1996) model suggests that customers define the value and companies can only design service prerequisites, including service concept, service process and service system, to support for the customer process. This model has lots of similarities to the S-D logic and it will be utilized to help to understand how a firm can design and prepare for facilitating service in the chapter 2.3.3.

2.1.3 Service dominant logic as the foundation of service theory

In S-D logic, service is a base of all economic exchange and service means the process of using one’s competences for the benefit of some party (Vargo & Lusch 2004a). S-D logic reframes the foundational premises (referred to as FP in the text) of economic system and creation of value (Vargo & Lusch 2004a) and sets philosophical foundational for the development of service science (Maglio et al. 2009). The foundational premises are presented in Table 2.

Figure 3 illustrates that service is always exchanged for service. Both parties of the exchange are considered beneficiaries. The firm is benefiting from the customer and customer is benefiting from the firm. (Vargo & Lusch 2004a; Vargo & Lusch 2008). The term beneficiary refers to the value created in service (Vargo & Lusch 2008).

One of the core premises of S-D logic is that each beneficiary is always co-creating the value (FP 6). Co-creating does not refer to activities like participating to the production or development, but instead it refers to beneficiary’s internal value-creation activities. This is fundamentally different compared to the G-D logic where the value is embedded in the “intangible product” developed and produced by the company. (Vargo 2008).

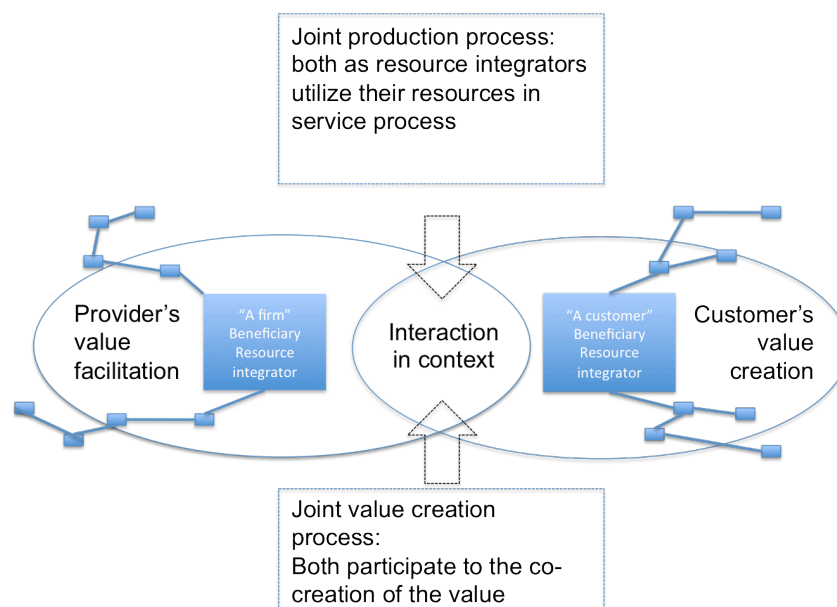


Figure 3 Service and value creation in service-dominant logic (Adapted from Grönroos 2011)

In S-D logic companies cannot produce value, but they can only offer value propositions for their customers (FP7) (Vargo & Lusch 2004a) to support and facilitate the value creation of the beneficiary (Grönroos 2011). In other words, value is not created until the beneficiary of the service, often the customer, integrates and applies the resources of the service provider with his own resources and resources of his network in the context of his own (Vargo & Lusch 2008).

As illustrated in Figure 3, besides being a service beneficiary, the actors in service process are considered resource integrators (FP 9) (Vargo & Lusch 2008). Resource integrators, one or more, form a service system that is a configuration of people, technology, value propositions connecting internal and external service systems and shared information (Maglio et al. 2009). The smallest service system is one person that does a favor for another, or a tailor making a suit to the "customer". The resources can be tangibles, which need to be acted upon (e.g., goods and materials), or intangible resources like knowledge and skills. Producing goods, as combinations of different tangible resources, can be considered as one type of service proposition. (Ibid). This is the main link between service and goods in S-D logic and it also leads to the situation that in S-D logic there is no services, only serving as an action. The service proposition, as configuration of different kind of resources, links Shostack's concept of service evidence (1977) to S-D logic. In many cases tangible clues are needed for the service systems to facilitate and thus experience service (Shostack 1977).

Table 2 The Foundational Premises of Service-Dominant Logic (Vargo & Lusch 2008)

	Foundational premise	Explanation
FP 1	Service is the fundamental basis of exchange.	The application of operant resources (knowledge and skills), "service," as defined in S-D logic, is the basis for all exchange. Service is exchanged for service
FP 2	Indirect exchange masks the fundamental basis of exchange.	Because service is provided through complex combinations of goods, money, and institutions, the service basis of exchange is not always apparent
FP 3	Goods are distribution mechanisms for service provision	Goods (both durable and non-durable) derive their value through use – the service they provide
FP 4	Operant resources are the fundamental source of competitive advantage.	The comparative ability to cause desired change drives competition
FP 5	All economies are service economies.	Service (singular) is only now becoming more apparent with increased specialization and outsourcing
FP 6	The customer is always a co-creator of value.	Implies value creation is interactional
FP 7	The enterprise cannot deliver value, but only offer value propositions.	Enterprises can offer their applied resources for value creation and collaboratively (interactively) create value following acceptance of value propositions, but can not create and/or deliver value independently
FP 8	A service-centered view is inherently customer oriented and relational.	Because service is defined in terms of customer-determined benefit and co-created; thus it is inherently customer oriented and relational.
FP 9	All economic and social actors are resource integrators.	Implies the context of value creation is networks of networks (resource-integrators).
FP 10	Value is always uniquely and phenomenological determined by the beneficiary.	Value is idiosyncratic, experiential, contextual and meaning laden.

The value of the beneficiary (e.g. customer) is always uniquely and phenomenologically defined (FP10). The concepts of value-in-use and value-in-context describe the characteristics of value in service process compared to the value-in-exchange in G-D logic (Vargo & Lusch 2008). As an example, a person buys a car, which is created by integrating different resources of the car manufacturer. The car does not have value itself, or it has the exchange value defined by the price, but the in S-D logic the value is only created when the person integrates his own resources, either his own driving skill or another person's driving skill, to utilize the car to transport him from place A to B. During this transportation, the car company's resources and the person's own resources together are co-creating the value-in-use. Customer is willing to pay the price to be able to use the car company's resources for changing from place to place.

Value-in-context is uniquely derived at a given place and time and is phenomenologically determined based on existing resources, accessibility to other resources and the circumstances (Vargo, Maglio & Akaka 2008). The terms value-in-experience and value as experience have also been used (Boztepe 2007).

To summarize, service is considered a process between two service systems that are influenced by the other service systems they are networked with (Vargo & Lusch 2008). The firms can only offer service propositions to facilitate and support the value creation of the customer (Grönroos 2011). These value propositions are configurations of different resources, both tangible and intangible that the service system has an access to (Maglio et al. 2009). Each service encounter is unique in its nature and context (Vargo & Lusch 2008), and therefore understanding the concepts of experiential value (Boztepe 2007) and value-in-context (Vargo, Maglio and Akaka 2008) are important in designing of service propositions.

2.2 Service innovation

In this thesis, the target level of the innovation is set high. The aim is not just to enhance the current service propositions, but look for seeds of disruptive innovation that to shape the market. These innovations that challenge the current way of doing things have been called with different terms, like strategic innovations (Markides 1997, 1999; Govindarajan & Gupta 2001; Tuulenmaki & Välikangas 2011), creating new market space and blue ocean strategy (Kim & Mauborgne 1999, 2004, 2005, 2009), revolution strategy (Hamel 1996), value reconfiguration, prime movers (Normann 2001), game-changing strategies, business model innovations (Markides 2008) and discontinuous innovations (Michel, Brown & Gallan 2007).

There are hundreds of examples of disruptive innovations, including Ikea, Dove, Apple, Canon, Starbucks, Omenahotelli and Kone. There have been many scholars researching these examples and mapping out ways to find new value opportunities (e.g., Tuulenmäki 2010, pp. 29-86; Kim & Mauborgne 1999, 2005; Markides 1997), but still it seems to be relatively hard to create one. Tuulenmäki and Välikangas (2011) claim that finding the value opportunity idea is not hard, but the trick is to succeed in executing it.

In execution, the first step is to find good execution ideas and then implement them in practice. For example, “hundreds of companies throughout the world are in the business of offering inexpensive furniture, but none of them have executed the idea more innovatively than IKEA, which pioneered a unique system for designing, making, selling and delivering its products. A new business model with a number of features that give it significant marketplace advantage – only emerges after a learning process of iterative experimentation” (Tuulenmäki & Välikangas 2011).

When something is truly novel we cannot study and plan it into existence, but we need experimentation to learn through a trial-and-error process (Ries 2011, pp. 37-55; Tuulenmäki 2010, pp. 19). Planning relies on the facts known at the planning moment and that is not enough in the complex and uncertain business environment (Lee et al. 2004; Tuulenmäki & Välikangas 2011). This is evidently

true if you look at the development with the S-D logic lens. A lot is unknown about how the customers will react to, interact with, and accept the novel service. so there is a need for a structured approach to capture such knowledge (Passera, Kärkkäinen & Maila 2012).

Experimentation-driven innovation approaches are challenging the traditional planning-oriented way of developing new offerings and strategies. As the name suggest, this new approach emphasize the role of experimentation and prototyping throughout the innovation process (Tuulenmäki & Välikangas 2011; Hassi & Tuulenmäki 2012). In this thesis the experimentation-driven innovation approach is applied to the service industry cases in systematic way. Existing experimentation-driven innovation models are presented in chapter 2.4.2.

Experimentation-driven innovation is an example of design orientation emerging in innovation literature. Design science has developed variety of tools for exploration, evaluation and communication of ideas and understanding and testing with the customer.

2.3 Service design

As they started discussing what a service is, academics started to write about how to design services. One of the first ones was Shostack (e.g.,1982), who combined design and services to improve the problems of quality in services. Shostack introduced one of the first design tools service blueprinting in 1982 (Shostack 1982; Shostack 1984). For today's scholars, service design is all about improving service experiences and innovating novel service propositions to enable superior value for customers (Stickdorn & Schneider 2010; Kimbell 2011). Service design aims to make services more useful, usable, efficient, effective and desirable (Moritz 2005).

Kimbell (2011) categorized the approaches of service design according to how the scholars define services and how they think about design (see Figure 4). There are four categories: engineering, service engineering, non-engineering design disciplines, and design for service. Under the category of engineering goes the old literature, which relay heavily on G-D logic, and consider service as products. (Ibid). The production line philosophy to services, for example, which is also known as McDonaldization (Levitt 1972), belongs to this group. Service engineering consists of approaches that consider services as basic unit of exchange but see design as a problem-solving tool (Kimbell 2011). An example could be Shostack's (1982, 1984) blueprinting approach. One of the latest conceptualization is the design for service approach (Kimbell 2011; Stickdorn & Schneider 2010) that base on S-D logic and sees service design as enquiry for the possible solutions of service systems and service propositions. Design for service is an on-going iterative and exploratory process that is never totally complete. In this thesis, the service design is seen as in design for service point of view.

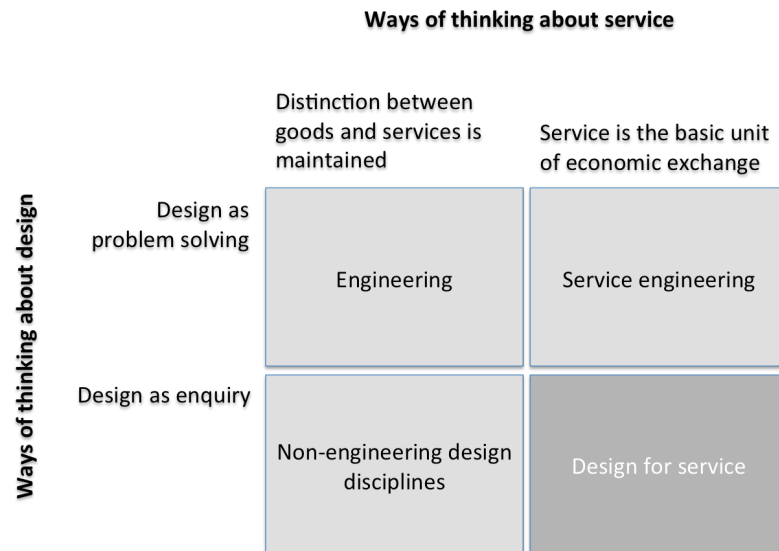


Figure 4 Conceptualizing service design (Kimbell 2011)

2.3.1 Principles of service design

Stickdorn and Schneider (2010) use the term service design thinking to highlight the process of thinking rather than designing for a certain outcome. They agree that the process produces various outcomes, e.g., organizational structures, operational processes, service concepts and concrete physical objects (Stickdorn & Schneider 2010, p. 14), but design for service is all about applying design principles for the on-going process. Marc Stickdorn (Stickdorn & Schneider 2010, p. 34) suggests five principles for service design:

- *User-centered*: Services should be experienced through the customer's eyes, because the value is contextual and experimental (Vargo, Maglio, & Akaka 2008).
- *Co-creative*: All stakeholders should be included in the service design process. This refers both to the ability and need of gathering information on them, but also to the process of elaborate and interpreted the information to create shared understanding. To avoid misinterpretations, the term co-develop is used to refer the design process, and leave the term co-creation to refer the value generation process during the exchange of services.
- *Sequencing*: The service should be viewed as a sequence of interrelated actions. This emphasizes both the process orientation and nature of exchange and interactivity being the core of S-D logic.
- *Evidencing*: This helps make the service propositions more tangible, complexity more readable and alternatives shareable (Diana, Pacenti & Tassi 2009).
- *Holistic*: The context and whole process affects on the experienced value (Stickdorn & Schneider 2010, p. 34). In addition, Kimbell (2011) calls for business orientation, because it is necessary to design the service and business model hand in hand.

In practice, design team needs expertise from different fields. Service design is seen as an interdisciplinary approach that combines different methods and tools from various disciplines from management, marketing, operation management to industrial design, graphic design, and ethnography (e.g., Holmlid & Evansson 2007; Stickdorn & Schneider 2010, p.18).

Service designers developed various tools and techniques to deal with the complex nature of services. The main functions of service design techniques are research and conceptual exploration (Clatworthy 2011), planning and innovating the service logic (Bitner, Ostrom & Morgan 2008), testing and validating service concepts (Blomkvist & Holmlid 2009), facilitating communication among stakeholders (Buchenau & Fulton Suri 2000; Houde & Hill 1997) and keeping empathy towards the users (Iacucci, Kuutti & Ranta 2000; Mattelmäki 2005).

2.3.2 Design process

Besides techniques also the service design process is starting to find its form. A variety of different process models can be found in the service design literature and on companies' websites (e.g. Moritz 2005; Service Design Tools 2011; Stickdorn & Schneider 2011). Typically, the service design process has four phases, which are repeated iteratively and sometimes parallel (see Figure 5) (Stickdorn & Schneider 2011, pp. 126-135). First phase is exploration of the situation and needs. The term discovery (Mager 2009) is also used.

The second phase is creation of ideas and concepts. The third phase is reflection; meaning testing and analysis the results of this evidencing. The last phase is implementation of the service concept. (Stickdorn & Schneider 2011, pp. 126-135).

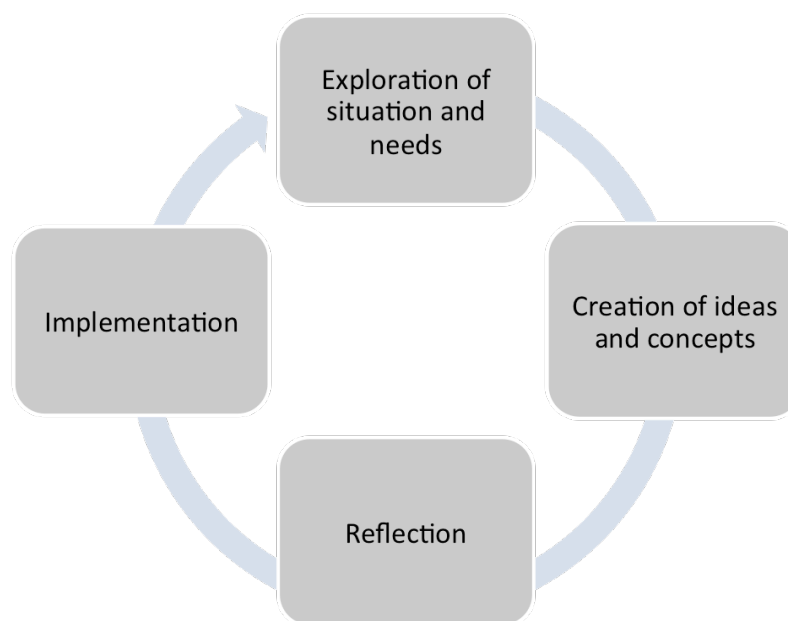


Figure 5 Typical iterative service design process (Stickdorn & Schneider 2011, pp. 126-135)

2.3.3 Designing service propositions

The aim of this chapter is to define how companies can design service propositions that support and enable customer's co-creation of novel value.

Edvardsson and Olsson's (1996) model of service prerequisites explain what companies can design, and how customer's service process and value creation relates to that. Although the model is published before Vargo and Lusch wrote their first paper about S-D logic (2004), it reflects the S-D logic in most of its parts.

Edvardsson and Olsson's (1996) model constructs of three parts: customer outcome, customer process, and service prerequisites (see Figure 6). Customer process and service outcome (see the left in the Figure 6) are parts which customer affects directly, and which the company cannot control totally. The service prerequisites, including service concept, service process and configuration of service system, form the company's perspective of the service. These prerequisites company can design and control. (Ibid). Designing prerequisites reflects well the S-D logic, because these can be seen as the configuration of the service setup that enable guiding and facilitation the service process (see right side of the Figure 6).

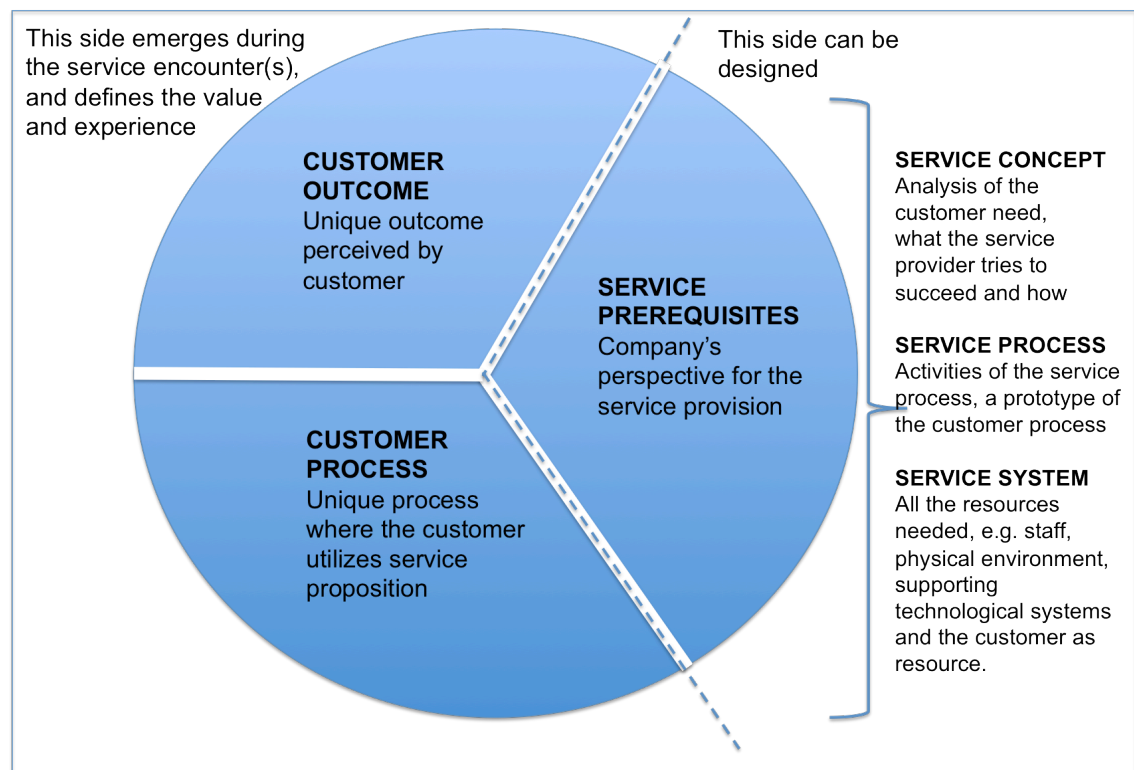


Figure 6 Visualization of the object of service design (adapted from Edvardsson & Olsson 1996)

2.3.3.1 Customer outcome and process

Customer outcome refers to what customer perceives and values as the result of the service production. It can be tangible or intangible, temporary or lasting. An example of the outcome could be transportation from place A-to-B or new, fancy hairstyle. Customer outcome (Edvardsson & Olsson 1996) is close to the concept of

needing (Strandvik, Holmlund, & Edvardsson 2008) describing the intended outcome of the service. Paraphrasing Strandvik, Holmlund, and Edvardsson (2008), the challenge for companies is to understanding customers' needs to create corresponding customer based value propositions, resulting in valued customer outcomes that are superior to other alternatives perceived by the customer.

The second part, the customer process, emphasizes the customer's own service process, and the interaction between customer and firm. The value is created during the customer process on the interaction with service proposition (Edvardsson & Olsson 1996) and determined phenomenologically and contextually by the beneficiary (Vargo & Lusch 2008).

The evaluation of service design success relates closely to customer outcome and value creation process. The service experience together with the needs, wishes and expectation defines the perceived value of the service (Edvardsson & Olsson 1996). Concepts like value-in-context (Vargo, Maglio and Akaka 2008) and value-in-experience (Boztepe 2007) help to understand how the value is determined.

According to Manzini (2011), a designer's task is to make unintended behavior more difficult than the intended one. (Manzini 2011 in Meroni & Sangiorgi 2011) Besides the behavior also feelings, emotions and expectations should be taken into account and controlled. Some of the prerequisites help to control these.

2.3.3.2 Service concept

Service concepts are the departure for other prerequisites. According to Edvardsson and Olsson (1996), service concept describes the core and supporting services, and the customer's primary and secondary needs the service tries to fulfill. Simply, the service concept is defined as the representation of the service in the mind (Clark, Johnston & Shulver 2000). Both customers and employees formulate this picture of mind, an overall picture of what service is about and how it is offered (Meyer et al. 2002, Edvardsson & Olsson 1996). It can be noticed in the situations where customers tend to have a grasp what is the service like, even if they haven't experienced it earlier (Clark, Johnston & Shulver 2000). They have a sense of the service concept, which can be a result of the word-of-mouth, sources of information like marketing, or from other similar situations or experiences in life (Meyer et al. 2002).

Service concept links the strategic intent and customer needs together (see Figure 7). Meyer et al. (2002) claim that this model is something that has been missed for a long time. It provides a framework for the linkages how service delivery system and decisions relating to it (structure, infrastructure, processes) accommodate the market positions, competitors, and the type and needs of the customers. (Meyer et al. 2002) The importance of the service concept is high. Kimbell (2011) calls for ongoing review back and forth between the business model and the service design.

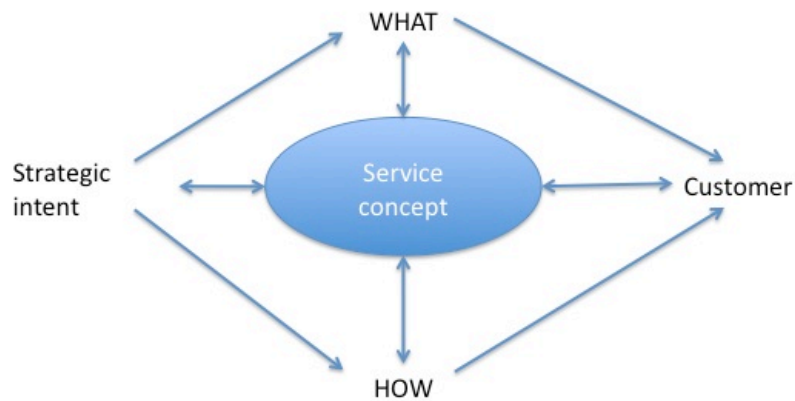


Figure 7 Service concept links the strategy and customer needs (Meyer et al. 2002)

According to the Meyer et al. (2002) the service concept can be utilized for different purposes:

- It works as a foundation upon which the components of the service delivery system are built on.
- It provides a tool for evaluation, whether the service is what customer's need and does the concept fulfill the strategic targets.
- It's a scheme to communicate about the service. (Ibid).

The role of service concept in the service development, design, and management is still quite minimally described in academic literature, although the word is widely used among practitioners. In this thesis, the service concept is an essential framework. It is important to understand how strategy, service design, and customer are linked together.

2.3.3.3 Service process

A second prerequisite, service process is seen as an interface to enable each customer process (Edvarsson & Olsson 1996). A term service touchpoint is often used for these interaction contact points between the service provider and the client (Clatworthy 2011). For example, a bank's touchpoints include its physical bank offices, website, physical printouts, self-service machines, bankcards, phone assistance and call-centers. Customer might utilize many different touchpoints as part of a customer process, and orchestration of these touchpoints is seen crucial to the success of service design (Shostack 1984; Edvardsson & Olsson 1996; Clatworthy 2011). Thus, to create holistic experiences, the designers not only have to understand qualities of touchpoints at an individual level, they have to understand how they combine to create a holistic service experience in relation to a desired brand image and all intangible aspects relating to the context. (Clatworthy 2011) Although the concept of touchpoint dates back to Shostack's first article (1977), the linkage between touchpoint design decisions and holistic experiences is not well understood (Clatworthy 2011).

There is a close linkage between service process, touchpoints and resources in the service system. In practice, many of the touchpoints are well-designed configurations of both tangible and intangible resources. Secomandy and Snelders (2011) try to clear up the connection between resources of the service system and the service process with distinction of interface and infrastructure resources. Interface resources are the sociotechnical resources immediately associated with exchanges between providers and clients. Infrastructure resources accounts for resources less directly related to that exchange of service with customer. Exchange relations between two service actors require mobilization of infrastructure resources but, ultimately, are realized through the interface resources that actualize the service co-creation. Distinctive criterions between infrastructure and interface resources are time and place. (Ibid). Shostack's (1977) line of visibility or Ramswamy's (1996) distinction between internal and external service process can help the designer to make understand the division between these two categories.

2.3.3.4 Service system

Service system consists of all the resources that the service process needs to realize the service concept. The development of service process and service system goes hand in hand. (Edvardsson & Olsson 1996). The physical aspects of service touchpoints can be considered to belong to the resources of the service system, where the process explores the interaction with customer process and experience.

Service system includes organization and control, staff, physical environment, supporting technological systems (Blomkvist 2011), and the customer as resource (Edvardsson & Olsson 1996). Customer as resource refers firm's ability to integrate customers to participate service provision (e.g. design, assembly, self-service). For example, IKEA has managed to mobilize customers to do tasks that are normally done by company staff. IKEA makes customers to collect the furniture from the inventory, to pay in self-service cashier, to transport them in to the location needed and to assemble. Probably this is one of the cheapest assembly lines existing. Vargo and Akaka (2009) identified this as coproduction in S-D logic. The customer's role in coproduction is optional, whereas their role in value creation is not; value is always co-created (ibid). Physical environments, also called servicescapes, facilitate the service provision (Bitner 1992) and will be described next in more detail.

2.3.3.5 Servicescape - the physical environment of the service

The term servicescape refers to the physical surroundings that facilitate the provision of the service offerings to customers (Bitner 1992). Servicescape comprises tangible (such as building, decorations and fixture), intangible (such as temperature, color, scent and music), and social (amount and appearance of people) features (Baker 1987) (see Table 3). Servicescape affects expectations of the service (Bitner 1992), the service experience itself (Hoffman and Turley 2002), and the behavior of the employees and customer (Baker 1987; Bitner 1992; Hoffman and Turley 2002). It is also a means to differentiate from the competitors, by signaling the intended market segment, positioning the organization and conveying distinctiveness from competitors (Kotler 1973). The research suggests

also that physical environment has major influences on the customer's ultimate satisfaction with the service (Bitner 1992).

Table 3 Servicescape consists of different factors (Adapted from Baker 1987, p. 80)

Ambient factors	Background conditions that exist below the level of our immediate awareness	Air quality Temperature Humidity Circulation / Ventilation Noise (Level /Pitch) Scent Cleanliness
Design factors	Stimuli that exist at the forefront of our awareness	Aesthetic functional Architecture layout Color comfort Scale signage Materials Texture, Pattern Shape Style Accessories
Social Factors	People in the environment	Audience (other customers) Number Appearance Behavior Service Personnel Number Appearance Behavior

According to scholars, the physical factors can be systematically manipulated, designed, and managed so that the customers behave as intended and feel pleasant (Bitner 1992). The first step is to identify and understand what kind of behavior is intended. The behavior can be directly affected by layout, guidance, and signing, for instance. After defining the intended behavior, however, one has to define what internal responses (e.g. feelings, beliefs) will lead to the desired behaviors and how the environment should be configured to bring about such responses. In this stage the ambient factors and nuances, relating to the designed factors can be considered. (Bitner 1992). There is a lack of means and practice for designing servicescapes holistically. There is knowledge about architecture or ambient design (Donovan & Rossiter 1982), but design tools for servicescape design are undeveloped (Bitner 1992).

Servicescape is an important concept for service designers because it is closely connected to the service experience, the service outcome, and customer satisfaction. Servicescape is also a way to communicate the service concept, because, like Bitner (1992) claims, servicescape helps to set the expectations about the type and quality of the service. The overall perception of servicescape enables the consumer or employee to categorize the firm mentally as well. For example, research shows that, in the restaurant industry, a particular configuration of environmental cues suggests "fast food" whereas another configuration suggests "elegant sit-down restaurant" (Ward, Bitner, & Barnes 1992).

Servicescape seems to be one of the important configurations affecting on value creation. One cannot avoid taking them into consideration when designing and determining the success of design, and therefore it is also an important concept for service prototyping.

2.4 Experimentation in innovation process

The significance and benefits of early experimentation/prototyping have been long recognized in e.g., industrial and interaction design, both representing work featuring complexity and unclarity (Wong 1992; Blomkvist 2011). During the last years, however, the concept of early, rough, and iterative experimentation has been brought to the center of innovation discussion within management and business literature (Thomke 1998; Tuulenmäki & Välikangas 2011). Experimentation-driven innovation process models are getting more common compared to those that are specification-driven especially when innovating in unpredictable, complex, and unclear environments.

In more traditional innovation models, like stage-gate, designers tend to concentrate on planning the process and designing the solution until the near end when the pilot test is done to finalize the project and solution. Often these pilot testes are large-scale, consuming significant time and resources (Schrage 2006), and when feedback on what does not work comes so late, total costs can spiral out of control (Thomke 2003, pp. 2). At this point opportunities for innovation are lost, which leads to reinforcing the emphasis on getting it right the first time (Thomke 2003, pp. 2).

Utilizing experimentation from the early beginning means rethinking the role of failure in organizations (Ries 2011, pp. 75-78). Effective experimentation is supposed to reveal what does not work early, and failure can lead to success earlier and faster (Thomke 2003, pp. 2-3; Ries 2011, pp. 75-78). Experiments resulting in failure are not failed experiments; they are a change of learning. Much of what companies learn from "mammoth experiments" can be learned from smaller tests that involve fewer variables, and save resources for follow-up tests (Anderson & Simester, 2011).

Indeed, Thomke (2003) goes so far as to claim that the heart of every company's ability to innovate lies in a process of experimentation that enables the organization to create and evaluate new ideas and concepts for products, services, business models, or strategies (Thomke 2003, p. 12).

2.4.1 Experimentation process

Experimentation, in a nutshell, is an iterative process of; learning what works and does not work by trying things out. Each trial generates new insights on a problem or topic, and consecutive cycles generate alternatives and enhancements to the solution (Ries 2011, p. 75-78). It is not reasonable to expect to create an innovation, especially disruptive innovation, with a single experiment. Instead, a series of experiments are needed to evolve the novel solution. (Thomke, Hippel & Franke 1998; Tuulenmäki & Välikangas 2011; Ries 2011, pp. 75-78).

Experimentation can be considered as a four-step process (see Figure 8): setting the hypothesis, planning the experimentation, executing the experimentation and analyzing the results and the process (e.g., Thomke 1998; Davenport 2009; Ries 2011, p. 75). Experimentation enables testing of the fundamental assumptions behind ideas. The data and feedback of what works and what do not work allows for constant adjustments for the ideas and assumptions. (Ries 2011, pp. 75-78).

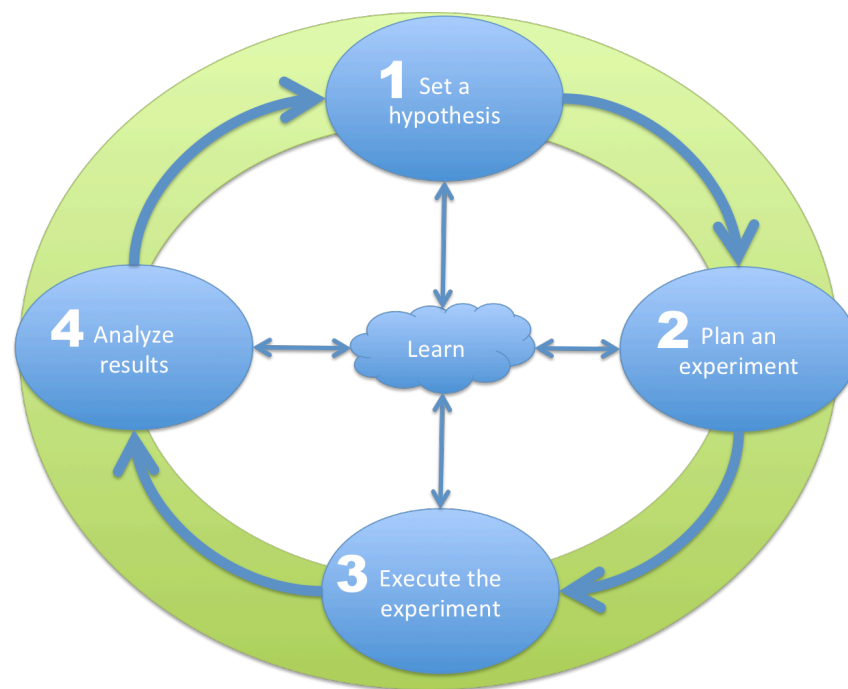


Figure 8 Typical experimentation process (adapted from Thomke 1998, Davenport 2009)

2.4.2 Experimentation-driven innovation models

Alternative approaches for experimentation-driven innovation can be found. Execution Innovation Model (Tuulenmäki & Välikangas 2011), visible in the Figure 9, illustrate how new business models can only emerge from a learning process of iterative experimentation, where the very purpose of instant experimentation is to actually create the specification to the business system. The basis of the model is that the idea of execution is frozen after various iterations of validation and exploration of the implementation possibilities. (Ipid).

One alternative experimentation-driven innovation model is Discovery-driven Growth Process (McGrath 2010) in which the traditional yearly business development is substituted with basic principle of setting the target for the year, and experimenting it as cheaply as possible to earn from and to be able to reset the target. Another example is Lean Start-up approach which sees start-up companies as means of assessing which parts of the strategy work and which do not work (Ries, 2011, p. 56).

I will discuss the Execution Innovation Model (Tuulenmäki & Välikangas 2011) in more detail.

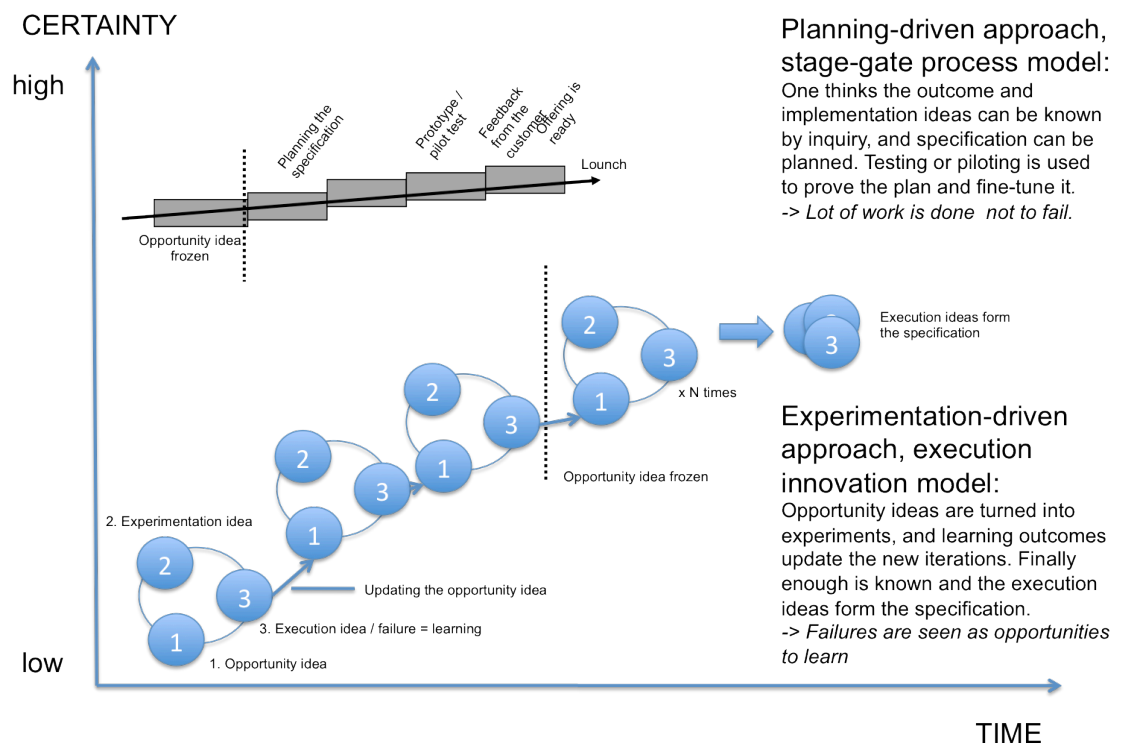


Figure 9 Experimentation-driven innovation model versus traditional planning-driven innovation model (adapted from Tuulenmäki & Välikangas 2011; Hassi & Tuulenmäki 2012)

The experimentation-driven innovation model presented in Figure 9 is a process in which three different types of ideas are iterated. The first task is to generate value opportunity ideas. Hassi and Tuulenmäki (2012) suggest that it is useful to break down the opportunity idea to smaller pieces by creating value propositions. Additionally it is better to focus first on a specific user group and a specific situation. At this point, the ideas of the value proposition are still based on assumptions. (Ipid).

The next task is to experiment with the value opportunity ideas as fast as possible to be able to figure out what ideas work and have potential. To be able to create the experimentation, an experimentation idea is needed. As Hassi and Tuulenmäki (2012) state, "The leading question for creating the experimentation ideas proved to be 'how to create the right setting to communicate the value you are proposing to a potential customer, in a manner that allows them to understand

your message and experience the value as “real” as possible, and allows you to learn whether your solution works or not.’” In practice, the teams needed to consider the type of prototypes that might be needed; tangible or intangible artifacts that would put in front of the users, to be used by them (ipid). Although this sounds complicated, it should be kept simple. The aim is to create the minimum viable prototype of the value proposition (Ries 2011, pp. 76-77; Passera, Kärkkäinen & Maila 2012).

During the experiment, the execution ideas are collected. Execution ideas address, on a very practical level, how to unlock the potential in the opportunity idea so that it creates value for the customer and for the company. Execution ideas can include both larger ideas, such as the customer need that a business serves, or smaller implementation ideas, for instance how to execute a certain task. To create the specification for the novel business system, you need much iteration to identify the most promising value proposition and verify the assumption made during the ideation. (Hassi & Tuulenmäki 2012).

Experimentation driven innovation models do not provide significant insight as to how the experimentation should be done in practice. There is a call for well-designed, early, rough, small-scale experiments to learn about what is unknown (e.g. Brown 2008; Ries 2011, pp. 75-78; Tuulenmäki & Välikangas 2011). Prototyping has also long history in different fields of design and therefore it is a promising way to answer to this demand (Thomke 1998; Tuulenmäki & Välikangas 2011).

2.5 Service prototyping as means to experiment

Service prototyping is an emergent field of study (Blomkvist & Holmlid 2009; Holmlid & Evenson 2007), and its professional application is divided into a variety of approaches and activities. Prototyping has been recognized as an important part of most design disciplines, it is even more important for service design.

The origin of the prototyping comes from the fields of product and graphic design. The interaction design of software systems brought it into the center of the design process. (Wong 1992) The over two decades long practice of prototyping have developed several well-known methods of prototyping, for instance rapid prototyping (Zelkowitz 1980) and paper prototyping (Ehn & Kyng 1992). Many of these methods have laid the foundation for more recent prototyping approaches; experience prototyping (Buchanau & Fulton Suri 2000) and service prototyping. But where products can be prototyped by drawing, building a model, or mock-up of the product, services are more complex to prototype because of the immateriality, complexity of the system and emphasis on the user experience (Stickdorn & Schneider 2011, pp. 132-133).

Both academic research and in practice the service prototyping is young and un-developed field. The field is lacking both conceptual understanding and means for implementing it efficiently in practice. This study will concentrate especially to the pragmatic perspective by exploring the means and practice of service prototyping.

2.5.1 Prototyping in general

Prototypes are visual manifestations of ideas (Lim, Stolterman & Tenenberg 2008) that help to “make the ideas more tangible, complexity more readable and alternatives shareable” (Diana, Pacenti & Tassi 2009). Prototyping makes the ideas concrete (Fulton Suri 2008) so that everyone can understand them. The main purpose of prototyping is to test the hypothesis and assumptions relating to the idea (Blomkvist 2011), to generate information (Ries 2011, p. 75) and facilitate communication (Segelström & Holmlid 2009; Samalionis 2009). Having concrete and practical representation provides a common reference point that allows stakeholders to collaborate and evaluate design suggestions. By prototyping, the team can identify problems early and save money and reduce risk (e.g. McCurdy et al. 2006).

Prototyping provides possibilities to look the design from customer perspective. It is commonly believed that solutions developed by prototyping attune to end-user needs and wants better (Schrage 2006; Samalionis 2009). Prototyping enables either involvement of the users themselves to the design process, or it can help designers to adapt to the role of the customer (Buchanan & Fulton Suri 2000). User-centeredness is central principle in design, and it has widely spread to all design fields. Traditional ways of involving users are not enough anymore; in truly uncertain situations, conventional market research is of little use. If you had asked people in 1990 what they would be willing to pay for an Internet search, no one would have known what you were talking about (Mcgrath 2011) People cannot predict or otherwise know what their future wants will be. Prototyping allows customers to react to the future instead of trying to make them imagine and think about it. The same applies to the designers; one cannot truly adapt to the users role, if one do not really experience it (Buchanau & Fulton Suri 2000).

2.5.2 Prototyping vocabulary

This chapter establishes the terminology used in prototyping literature by defining the term prototype and different subsets of prototypes, including visualizations, mock-ups and pilots.

The word prototype is used in many different contexts and disciplines, and it is used in design for various purposes (Houde & Hill 1997; Blomkvist 2011). For industrial designers, for instance, a foam model is a prototype. Interaction designers use the word to refer to a simulation on screen while programmers use it for a test program. User centered designers may call a prototype a storyboard, which present a scenario, as a prototype. (Houde & Hill 1997).

Blomkvist (2011) analyzed different conceptualizations of the prototypes and found common themes from different disciplines. A connective definition for a term prototype is: A prototype is an early embodiment, a representation or manifestation of an idea that is formulated in form of assumptions or hypothesis. Prototype is a medium to test an idea against specific criteria, so to see if the hypothesis holds. (Blomkvist 2011). This definition is particularly relevant to this research because it emphasizes the importance of utilizing prototypes to test

service concept hypotheses.

Visualizations, mock-ups and pilots are all used to refer certain types of prototypes. Visualizations are representations that are based on the visual acuity, often in 2D. The term mock-up is used for early, un-polished prototypes that are being used to explore functionality (Moritz 2005). Pilots, in turn, are mature prototypes that can be practically applied in real environment. All of these can be considered as prototypes depending on how they are used in the development process. If the intention of having the representation is to learn and test the ideas and assumptions, then it can be considered a prototype (Houde & Hill, 1997; Blomkvist 2011).

The terms prototype and prototyping should not be confused, however. Prototypes are the representations of ideas and the artifacts that designers use when prototyping; prototyping is an activity or a mind-set (Blomkvist 2011). It is a process of learning from trial and error. Making the distinction between the action and the target of the action helps to understand the whole process. In this study the emphasis is on the learning process, prototyping as an activity, although also central aspects of the service prototype itself are presented.

The difference between prototyping and experimentation is rather vague. Thomke (1998) defines experimenting as an iterative trial-error learning process; as a form of problem solving that is a fundamental activity in innovation process. He utilizes experimentation as an umbrella term to all trial and learning mechanisms. For instance, he considers rough prototyping as one of the means for doing experimentations. (Ibid). Thomke's (1998) definition emphasizes the process of experimentation and the idealism behind it. Although it has a lot of similarities to Blomkvist's (2011) definition for the prototyping as a mind-set, experimentation is a slightly wider term for try-and-learn mechanisms.

In this thesis experimentation is used as general term for describing try-and-learn mechanism in the innovation process. The term prototyping is used when an idea is turned into physical representations that is tested and therefore used in the experiment.

2.5.3 Attempts to define service prototyping

Service design community defines service prototyping as a way to test the interaction of the user with a prototype of the service put in the place, situation and condition where the service will actually exist (Service Design Tools 2011). The service design community's definition for service prototyping outlines that testing has to happen where the service will actually exist. It is true that the place, condition, and situation affect a lot to the validity of the prototype (Blomkvist 2011), but services can be prototyped also elsewhere than in real contexts, for instance in laboratory like SINCO service development corner (Rontti et al. 2012), in the virtual environment (Meiren & Burger 2010), or in any other environment that can be imagined as the real.

In the current literature, examples of service prototypes vary from 2D-sketches to 3D-models or even 4D-models (Shostack 1984; Holmlid & Evenson 2006). An example of a 2D service prototype could be a sketch of customer journey drawn on the board and utilized to test the service idea. For 3D, it could be a mock-up of a service touchpoint that is used in a role-play. 4D service prototype takes into account also the time aspect of the service process. In 4D, service prototype a series of actions is tested with a service representation in 2D or 3D. The widest definition for service prototype is the actual result of the service design, the final design. In S-D logic, the service exists only when the real customer is co-creating the value during the production (Vargo & Lusch 2004a), although the service proposition is always a prototype. In this thesis the term service prototype is not used to refer to the final design. Instead, service prototype is a representation that is used in experiments before the service design is ready.

Some of the definitions for service prototyping emphasize the experiential aspects of service. Rae (2007) points out that good service prototypes appeal to emotions and feelings through stories. These stories can take the form of storytelling, cartoons, videos (Rae 2007), scenarios or role-playing. Buchenau and Fulton Suri (2000) from IDEO emphasize the experience aspect of the service even more by introducing a concept of experience prototyping. An experience prototype, they suggest, is “any kind of representation, in any medium, that is designed to understand, explore and communicate what it might be like to engage with the product, space or system we are designing.” (Buchenau & Fulton Suri 2000)

An experience prototype, it is not enough to create a prototype, like a storyboard. By definition, the prototype has to be something one can experience. They conclude that experience prototyping is rather a mind-set to keep the experience and interaction in the focus in the test. (Buchenau & Fulton Suri 2000). In some sources experience prototype refers to test the experience in as real environment and situation as possible (e.g. Moritz 2005). In this study to avoid confusion I use the term experience test when the service is tested in as real environment and situation as possible.

The first attempts to define service prototyping are vague and only take into account some of the characteristics of the prototype. Blomkvist (2011) tackled this issue in conceptualizing service prototyping. Academics, especially in the fields of information and interaction design, have long discussed how to categorize prototypes and prototyping techniques and what kind of decisions has to be made during the prototyping activity. In his thesis, the influence of the discussion and conceptualizations on the field of interaction design has been linked to service prototyping. Blomkvist (2011) compiled all the crucial dimensions of service prototyping into a holistic conceptual framework (Figure 10), which appears to be the most complete and detailed in the field to date.

2.5.4 Holistic framework for service prototyping

Blomkvist (2011) collected the existing conceptual knowledge of prototyping and created a holistic framework to open up the bigger picture. His literature overview contained thirty primary sources, mainly from the field of information and interaction design, but his aim was to conceptualize service prototyping (ipid).

Blomkvist's (2011) framework connects position in the process, purpose, audience and author, technique and validity, and fidelity and representation (see Figure 10). His framework is the first one that truly links together several perspectives to prototyping and it is applicable also to service prototyping (ibid).

Next I'll introduce these perspectives to illustrate what kind of aspects a prototyper needs to understand and take into a consideration during prototyping.

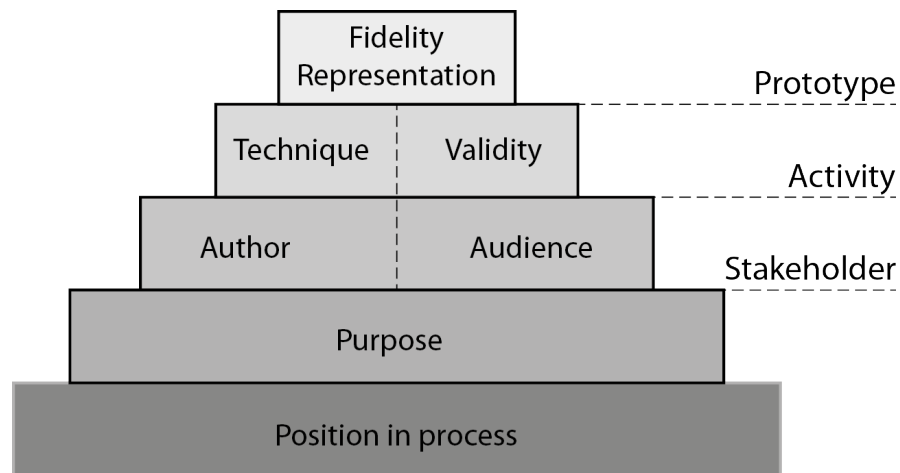


Figure 10 Conceptualization of service prototyping (Blomkvist 2011)

2.5.4.1 Purpose of the prototype and position in the process

There are a few ways to categorize prototypes relating to the purpose of the prototype. One of the most common is exploration, evaluation, and communication (e.g., Buchenau & Fulton Suri 2000; Smith & Dunckley 2002; Voss & Zomerdijk 2007).

Explorative prototypes are aiming to teach, inspire, and reveal new information whereas evaluative prototypes aim to answer questions and to receive feedback on assumptions. Communicative prototypes refer to the need of having tools to communicate complex service ideas to different audiences. (Blomkvist 2011). Holmlid and Evansson (2007) suggest that prototyping technique should be chosen based on the position in the development process and the purpose. Yet, it is impossible to categorize techniques based on these criteria. The same technique might be used in different stages and for different purposes (Tassi 2009).

Another way to see the purpose is to consider what prototypes are prototyping. Houde and Hill (1997) suggest that designers mainly use prototypes to address one of the three dimensions: role, look and feel, or implementation (see Figure 11). Integrated prototypes can be utilized to explore the balance between all three dimensions. Role can be understood as the function an artifact serves in a user's life, addressing the question how is the subject of design useful for them. Look and feel denotes questions about the concrete sensory experience in using the objects of design. Implementation prototypes try to open up the techniques and components the design artifacts needs to perform the functions and actions. (Ibid).

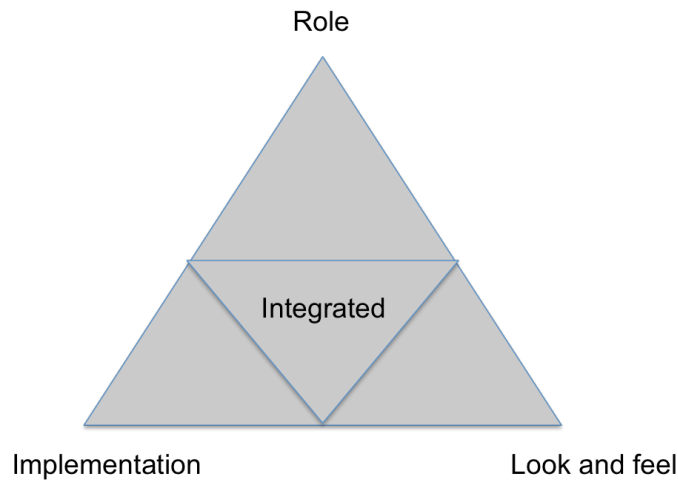


Figure 11 Subject of the prototype (Houde & Hill 1997)

The experimentation literature utilizes hypotheses to describe what is experimented. It offers a more practical view as purpose, and does not work as categorization criteria for either prototypes or the techniques used in them.

Setting the hypothesis in the beginning is an essential activity in experimentation (e.g. Davenport 2009; Ries 2011, pp. 56-57), and thus in prototyping. An hypothesis makes the purpose more explicit to all parties involved in the prototyping activity (Blomkvist 2011; Passera, Kärkkäinen & Maila 2012). Blomkvist (2011) claims that generally it can be assumed that the hypothesis is unformulated early on in project and then gets more and more elaborate as the project moves along.

In Blomkvist's (2011) holistic framework, the purpose is dependent on the prototypes position in the development process. Generalizing a little, the position of a process describes the amount of knowledge existing about the design problem. Some scholars still consider prototyping as an activity following the research phase and idea generation, but the evolution of rapid prototyping culture is changing the earlier paradigm by establishing prototyping as an on-going activity throughout the design process. (Ipid).

In summary, the purpose of the prototype can be explorative, evaluative, or communicative. Based on general purpose, the more detailed subject of the prototyping, the more elaborate the hypothesis should be. Next I'll present the top of the pyramid, because the central topics are easier to understand after discussing about the prototype itself.

2.5.4.2 The representation

According to Blomkvist (2011), at the top there is the prototype itself, what information it contains, what materials it includes, and to what fidelity level it is brought. However, Blomkvist (2011) does not present in detail what are the aspects of service prototype. To address this issue, utilization of Edvardson and Olsson's (1996) service prerequisites model is necessary to identify what kind of dimensions can exist in the service prototype. Table 4 introduces each dimension and explanation.

Table 4 The possible dimensions of service prototype

The service dimension	Explanation
Service concept	As learned, service concept describes the core and supporting services and the customer primary and secondary needs the service tries to fulfill (Edvardsson & Olsson 1996). Prototyping a service concept can be the start of the prototyping. Sketching, storyboarding or role-playing can be used to prototype service concepts. This is closely related to the role of the prototype (Houde & Hill 1997).
The interaction as form of service touchpoint	Interaction between the service provider and the user is an essential aspect of service experience. These interaction points are also called service touchpoints (Moritz 2005). According to Moritz (2005), all the service touchpoints have to be designed well so that a clear, consistent and coherent experience can be created. Touchpoints can be prototyped separately or as a chain of touchpoints that form the whole service process. Different drama methods, bodystorming and scenario building can be used to enact interaction with simple mock-ups. (Burns et al. 1994)
Service process and time	Process and time dimensions create the essence of the service prototype. Service is as a process of interaction between service provider and customer, and during this journey the value and service outcome are created (Edvardsson & Olsson 1996). The service provider cannot design the customer journey, but they can provide service process the customer can utilize (Edvardsson & Olsson 1996). Storyboarding, scenario creation, role-playing and bodystorming can be used to prototype service processes.
Physical artifacts	Prototyping the physical artifact, also called service evidence (Shostack 1974), is a way to make the immateriality of the service concept visible, memorable and experiential. The physical artifacts, like tickets, food, and menu can be prototyped with similar methods as products. These physical mock-ups or probs help to test the other dimensions.
Information	At certain point, information that is needed to successfully produce the service, like the information in the ticket, has to be prototyped. Often this dimension is prototyped along other dimensions (Holmlid & Evansson 2007).
The servicescape	The servicescape can be prototyped in many levels. The service environment is considered a key variable influencing customer perceptions and behavior during the service production (Bitner 1992). Even small changes in physical surroundings can have a significant effect to the service experience (ibid). It's important to experiment the ensemble of physical surroundings, and take the prototyping environment into account when prototype is analyzed.
Customer outcome and experience	The objective of the prototyping activity is to figure out whether the service proposition creates value to the customer and to assess what kind of experience it offers. The experience is born in interaction with people, places or objects (Buchenau & Fulton Suri 2000). Different contextual factors, such as social circumstances, time pressure, environmental conditions can affect on the experience. Prototyping service experience means that different dimensions affecting to the experience are prototyped together. This refers to the integrated prototype Houde and Hill (1997) presented.

2.5.4.3 The characteristics of representation - fidelity and resolution

Rudd, Stern and Isensee (1996) initiated the low- versus high-fidelity debate. The term fidelity refers to the closeness to the final product the prototype looks like. In general, low-fidelity prototypes are constructed quickly and provide limited or no functionality. These prototypes are created to communicate, educate, and inform, but not to train, test, or set requirements. High-fidelity prototypes are interactive and are used for evaluation. (Ibid). Some research has shown how fidelity is a problematic approach to defining prototypes (Lim, Stolterman & Tenenberg 2008; McCurdy et al. 2006). Wong (1992) points out that prototype might show both refined and rough characteristics in different aspects.

Houde and Hill (1997) suggest that sometimes it is better to talk about resolution, the amount of details existing in the prototype, instead of fidelity. There seems to be somewhat of a consensus that resolution decides what kind of feedback you will get (Wong 1992) from the audience of the prototype. Too high or too low prototype quality can prevent the audience to focus and generate useful feedback (Bryan-Kinns & Hamilton 2002; Houde & Hill 1997; Rudd, Stern & Isensee 1996).

Paraphrasing Passera, Kärkkäinen and Maila (2012), the fidelity should be used for single aspects of a prototype, while resolution (as the sum of the fidelity of distinct aspects) can represent the general level of verisimilitude of the prototype. The characteristics of the prototype affect on the prototyping and especially the analysis of the failures of prototyping. Sometimes the reason for failure is not the inaccuracy of the hypothesis but failure of the prototype to test that hypothesis (Passera, Kärkkäinen & Maila 2012).

2.5.4.4 Prototyping techniques

Service designers developed a variety of tools to deal with the complex nature of services. There exist several technique repositories, (e.g., Moritz 2005; Tassi 2009; Segelström & Holmlid 2009; Stickdorn & Schneider 2010; Service Design Tools 2011). Some techniques are designated for research and conceptual exploration (Clatworthy 2011; Segelström & Holmlid 2009), such as cognitive walk-through; others for planning and managing the service logic, e.g. service blueprint, customer journey, and business model canvas (Bitner, Ostrom & Morgan 2008). Some techniques aim at testing and validating service concepts (Blomkvist & Holmlid 2009), e.g. body-storming, role-playing, experience tests. Other techniques are good at facilitating communication among different stakeholders, e.g. video narratives, storyboarding, sketching (Buchenau & Fulton Suri 2000; Houde & Hill 1997). However, there is no clear understanding as to which techniques are service prototyping techniques and which are other design tools. For instance, depending on the source service, blueprinting is considered a prototyping technique (e.g. Tassi 2009), a visualization of the results of research or ideation (e.g. Segelström & Holmlid 2009), or a plan for service implementation (e.g. Moritz 2005). To maximize the benefits of service prototyping, it is important to understand what a service prototype technique is and what it does.

This study utilizes Blomkvist's (2011) definition for prototypes and prototyping to identify service prototyping techniques suitable for exploring and

evaluating ideas in the empirical cases. The repositories of Service Design Tools (2011) and Moritz (2005) and selected articles introducing new techniques were reviewed. Appendix 6 lists the techniques evaluated. Based on the principles of service design (Stickdorn & Schneider 2010) and the definition of prototyping (Blomkvist 2011) following criteria for choosing the service prototyping techniques was developed:

1. The technique produces a representation or an embodiment of the idea.
2. The technique has to provide a chance to test / reflect the idea against the hypothesis.
3. The technique has to be able , at least to certain extent, to take into account the holistic nature of service.
4. The technique has to enable to consider the customer perspective.

As a result of the analysis, the following service prototyping techniques are deemed to fulfill the above criteria:

- Cognitive walk-throughs
- Sketching, depends on the object that is sketched
- Storyboarding
- Scenario building
- Role-playing and improvisation theatre
- Body-storming
- Service walk-throughs
- Modeling and simulating servicescape
- Experience tests

These techniques can be utilized both to prototype certain dimensions of the service or multiple of them enabling holistic service prototypes. Short descriptions of these service prototyping techniques and reflection of the criteria are provided in Appendix 7.

2.5.4.5 Validity

In the conceptualization of service prototyping (Figure 10), validity is placed on the activity level, to represent the context in which the prototype is used or evaluated. Validity is closely related to technique and depends on how the prototype representation is. Technique is a choice about how the prototype should be developed and used, while validity has to do with how it should be tested and evaluated. Validity is a central concept in service prototyping, where the context of service and servicescape has to be taken into account in the evaluation process (Blomkvist 2011).

The choice of where the prototyping takes place affects validity. This will be further examined in the empirical study, where a service prototyping space is developed and tested. The aim is to figure out whether a prototyping space helps explorative prototyping, and when it should be used. Validity is one of concepts that are needed in this evaluation.

2.5.4.6 Author and audience of the prototyping

The author of the prototype and the audience represents the central stakeholders of the prototype. Audience is the group to whom the prototype communicates, or with whom testing happens (Blomkvist 2011). It is important that audience understands the representation and the technique in use. It is recommended that the fidelity (see 2.5.4.3) should be at par with the audience's ability to interpret and understand the prototype – its role and purpose – while at the same time elicit feedback at a meaningful level (Bryan-Kinns & Hamilton 2002; Samalionis 2009). Sometimes the audience is the internal development team, sometimes leaders and managers. Many times customers and clients are also involved (Blomkvist 2011).

In Blomkvist's (2011) framework author refers to the prototypers or planners of the prototype. Author is an organizational term for who owns the idea or a prototype. Author is also evaluator of the prototype. (ipid). In practice, author investigates and makes choices about the resources of prototyping (Passera, Kärkkäinen & Maila 2012). Generally little is known about the role of an author in terms of activating prototyping during the innovation process, and also the mechanism of how the authorship is born or managed (ipid).

2.5.4.7 The linkages between different elements

Figure 12 presents the links between different elements. The purpose has links to nearly all perspectives. The purpose will affect which stakeholders are involved, what prototyping activities are conducted, and how the prototype is represented. Author is the dedicated person responsible of the prototype. The author will make decisions of the resources available which affect both to technique and validity, and therefore to the final representation and resolution and fidelity level. Audience, on the other hand, has an affect on how the prototype is evaluated. The ability to interpret the prototype depends on the skills of the audience and it affects technique and the prototype itself. (Passera, Kärkkäinen & Maila 2012).

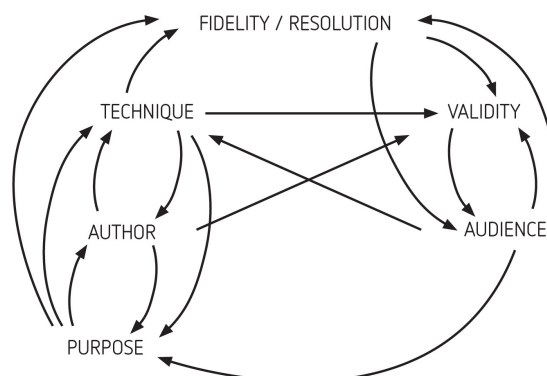


Figure 12 Links between different service prototyping perspectives (Adapted from Blomkvist by Passera, Kärkkäinen & Maila 2012)

2.5.5 Practical framework for prototyping

During this study, there was a more holistic, cross-case study on-going in the MIND-research group, centered around the subject of service prototyping. As a result of that study, just before this thesis was published, Passera, Kärkkäinen and Maila, published the Practical Framework for Service Prototyping (Passera, Kärkkäinen & Maila 2012). Unfortunately the framework was not in use in the empirical study. However, the main parts of the framework visible in Figure 13 are introduced here, and reflected in the discussion of how this practical framework would help in the experimentation-driven innovation process.

Neither the general process experimentation nor Blomkvist's (2011) conceptualization tells how the experimentation or prototyping should be done. Passera, Kärkkäinen and Maila's (2012) Practical Framework for Service Prototyping is envisioned as an aid for thinking and asking fundamental questions when prototyping. It utilizes Blomkvist's (2011) conceptualization of prototyping and Thomke's (1998) process of experimentation to map the influences between choices and to bring the conceptualization to actionable level.

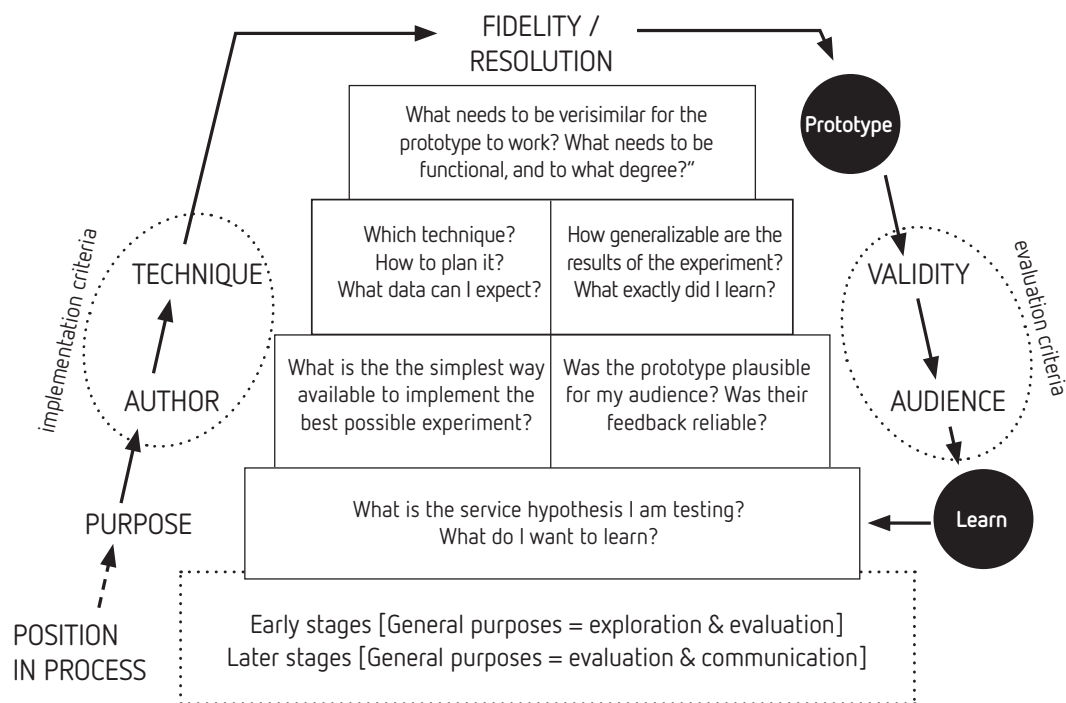


Figure 13 The Practical Framework for Service Prototyping (Passera, Kärkkäinen & Maila 2012)

The outer edge contains the experimentation process starting from the position in the process based on which the hypothesis in which format the purpose is formulated. The planning of the prototype considers mainly the author, technique and resolution, but as seen earlier in Figure 12 these perspectives has linkages to other parts of the Blomkvist's (2011) conceptualization of the service prototyping, therefore also validity and audience has to be taken into account when planning the prototype. The prototype in the up refers to the running of the experiment, the action phase were the prototype is tested. As demonstrated in the right portion of the Figure 13, the validity and audience set the main evaluation

criteria for the process (Passera, Kärkkäinen & Maila 2012). These are used in the analysis phase following the experimentation.

The aim of the planning of the prototype is to create plausible prototype that teaches about the purpose of the prototype. To gain the benefits of iterative, rough and fast prototyping, prototyper should prioritize simple actions over costly/time taking preparations, look for *the “optimal minimum setup” for the prototype*. The “optimal minimum setup” can represent the balance between how much time, effort and money is invested in the prototype versus the usefulness of the expected feedback and insights. (Passera, Kärkkäinen & Maila 2012). It is close to the concept of minimum viable product presented by Eric Ries (2011, p. 93).

2.5.6 Good prototyping practices

Good practices for boosting or supporting the prototyping were reviewed during the literature research. Relevant findings are as follows:

Formulizing a clear prototyping hypothesis (Blomkvist 2011; Ries 2011, p. 61; Passera, Kärkkäinen & Maila 2012; Hassi & Tuulenmäki 2012) makes the purpose of the prototype clear to everybody and helps the planning. In formulizing the hypothesis is good to remember that a single prototype cannot provide knowledge on each of its aspects, so multiple and different prototypes are needed (Buchenaus & Fulton Suri 2000).

There is a risk to fall in trap and start to concentrate on the prototype optimization. Dow, Heddleston and Klemmer (2009) give a good tip: *set time pressure and target*. Time pressure forces the team to get the prototype done. Tight time targets give a change to iterations that has shown to lead better design results than single round prototyping (ipid). An example of setting the targets is case study of an organization that aimed to have 100 tested ideas in 100 days (Gerber & Carroll 2011). In the case the tight time target forced the development team to fast and rough prototyping, instead of utilizing two weeks to optimize the prototype.

After analyzing comes learning and utilization of information it in the development process. *Documenting the learning and experimentation knowledge as format of library* (Davenport 2009) could be one asset for the organization to build in to help the prototyping in future.

To conclude the chapter of practices, there seem to be a support for having parallel prototypes on the subject besides the iteration rounds (Dow et al. 2010). *Parallel prototyping* means that multiple prototypes are produced and evaluation is done after testing the series of prototypes. This can be compared to one at the time prototyping, where evaluation is done after testing the prototype and the next hypothesis is set after that. Parallel prototyping seem to produce more diverse prototypes and learning results and increase the experience a greater self-efficacy. (Ibid).

2.5.7 Different service prototyping environments

Some of the service prototyping literatures emphasize the importance of real context and situation (Service Design Tools 2011). Interests towards different testbed solutions to support these kinds of situations are spreading among service prototyping (Meiren & Burger 2010; Miettinen 2011; Rontti et al. 2012; Passera, Kärkkäinen & Maila 2012) and innovation (Tuulenmäki & Välikangas 2011) scholars.

The following environments have been used as artificial prototyping environments:

- A dedicated space for service design or living lab: Have open culture for experimentation but not necessary any tools to support exactly service prototyping – an example found Huddle space in Sidney, Australia (Huddlespace 2012).
- A dedicated space for service prototyping, so called service prototyping lab, examples found are a SINCO lab in Rovaniemi, Finland (Rontti et al. 2012) and ServLab in Stuttgart, Germany (Meiren & Burger 2010).
- A movable service prototyping lab, examples Norstrom Innovation lab (Norström Innovation Lab 2012) or SINCO's movable toolset (Rontti et al. 2012).
- Temporary spaces, but not the real context of the service. Can be private or public space. (e.g., Blomkvist, Åberg & Holmlid 2012)

Data was collected concerning different examples of the prototyping environments to help to define base for the service prototyping space concept that is developed in the empirical research. Also the benefits and challenges relating to these examples are mentioned if there is information available.

2.5.7.1 Service design environments

Some companies offer service design spaces and facilitation. One of the examples is Huddlespace, located in Sidney, Australia. They have 450 square meters of creative workspace where companies can come and prototype their service. The staff supports the projects in utilizing the space with the facilitation, design methodologies, tools, and people. The space itself is dedicated to service prototyping for instance role-playing and simulating the services (Huddlespace 2012). Concrete examples of how they provide the support could not be found.

One of the longer existing examples that promote service design and experimentation are the living labs. A living lab is user-driven open innovation ecosystem that integrates users and innovation process to public-private-people partnerships. It operates in a territorial context (e.g. city, agglomeration, region) in The European Network of Living Labs (2012) has more than 300 places around the world. The realization of the Living Lab is a community, a way of working and networking, happenings, co-development projects, instead of being a physical lab where the activities take place. It does not help in concretizing the solutions for testbeds.

According to Lindström (2010), many service design environments are targeted to specific field of services or have massive immaterial concepts. These solutions do not directly support quick and dirty ideation or prototyping (ibid).

2.5.7.2 Dedicated service prototyping spaces

Two examples of service prototyping spaces were found. One of them is a service prototyping corner, SINCO, in Rovaniemi, Finland and other one is ServLab, in Stuttgart, Germany. Both of them are located in the university premises.

2.5.7.2.1 SINCO lab

SINCO lab is a service prototyping corner developed in the University of Lapland existing from year 2009. It is used to prototype service touchpoints, service moments, and service journeys. SINCO is inclusive combination of tools for service prototyping. The essential aspects are servicescape simulation, service stage, digital touchpoint toolkit, teamwork and documentation tools, rough mock-up crafting.

In more detail, 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)” (Rontti et al. 2012).

SINCO lab is very technology oriented. Rontti et al. (2012) admits that prototyping with a lot of technology involved prompts discussion about fidelity versus agility, balancing effort and benefit. They have also noticed that certain level of skills and training is needed before the users can utilize the space efficiently. The risk I see is that the playfulness and exploration might be hard. The technologies might be a trigger to bring the resolution higher than needed.

Based on the four case videos presented at SINCO lab’s (2012) webpage, SINCO lab provides a platform to ideate and build service touchpoint prototypes. The service stage is relatively small and offers space for single or small-scale service touchpoints. The projection of the servicescape gives a feeling of context but at the same time emphasize the roughness and separation especially if the picture or video is in the different fidelity level than the mock-up in the service stage. For certain touchpoints, especially mobile and touchscreen solutions, technology can help to bring the interfaces to higher resolution level, which enables testing different hypothesis, but for large scale touchpoints like service desks, restaurant setting, there is no tools or space to go further than a mock-up. Besides mock-up prototyping and role-playing, Sinco lab supports 2D prototyping, with interactive whiteboards. The benefit of technology here is to provide a change to bring the ideation and storyboarding results, normally existing in post-its or drawings, directly to electronic format. It remains open how they in details facilitate prototyping in the space. They have the information touchscreen that

tells about the functionality, but do they offer process or help in prototyping techniques remain open.

2.5.7.2.2 ServLab

ServLab in Stuttgart presents itself as a holistic platform supporting the development of new service ideas. They specialize the prototyping of service interaction, but also many aspects of servicescene prototyping are supported. The concept combines virtual reality to real-life role-playing. Wide stereo 3D projection wall is used to create the servicescape behind the service theater stage. Also smells and atmospheric voices can be used along the 3D model of the service environment. There is wide space for audience to follow up the prototyping session. In order to document the prototyping and the evaluation of service concepts both audio and video documentation are possible. (ServLab 2008).

In their process all the relevant stakeholders, customers, staff, and experts, are invited to take part in development session. Many times they utilize expert service actors to play on the stage. (ServLab 2008). According to Meiden & Burger (2010), actors “perform not only the generic roles of customers and employees but also are able to portray different characters whose functioning is important for the successful provision of services, such as a critical customer or an overstressed employee. The professionalism of the actors enables them to represent a broad range of different characters. They shift into these roles and, after playing such roles, provide feedback of their impressions to the audience. This procedure is particularly well-proven for prototyping and concept detailing. Further evaluation can also be obtained by integrating real customers and service providers into the ‘performance’.” (Ibid). At least, according to their case videos, the role of the audience, the import shareholders, is rather passive; people are participating by commenting and asking questions. It also remains open how pre-scripted the prototyping session are, which affects how explorative versus evaluative the prototyping is.

The projecting of virtual reality models instead of real-life picture or video also refers to more evaluative prototyping. The modeling of virtual reality takes time and effort and the idea has to be already pretty well-developed. One of the limitation Meiden and Burger (2010) mention is the cost-intensiveness. Main costs are associated with the creation of VR models and the cooperation with professional actors. A cost-benefit-analysis has to be an integral part of the testing activities as well. Although the technology has developed already, the feeling is still artificial, which might lead to different kind of behavior during the test. (ibid). In this concept, technology also plays vital role and both enables and restricts the prototyping methods.

2.5.7.3 Movable prototyping labs and toolsets

One of the examples of movable innovation and prototyping labs is Norström Innovation Lab (NIL). NIL is a team inside Norsdström Corporation, behaving like a small start-up. It explores ideas and tests them in whatever technology or means make sense. The NIL team uses both the lean manufacturing and lean startup approaches. It also conducts experiments with customers using human-centered design strategies and tactics. The team works in one-week increments, which

challenges the traditional slow speed of corporate innovation initiatives and also make NIL work efficiently around the subject. When the team discovers something valuable, it is passed on within the company, and the team moves on to the next challenge. (Norström Innovation Lab 2011).

The NIL team constantly does simple, rapid experiments. After initial ideation, they go inside the stores and continue developing the offerings among the clients by talking face-to-face with customers, salespeople, and managers. The team sets a working area in a retail store, including computers, printers, technology toolkits, and mock-up building materials and an ideation board that fill up of post-it notes and remarks. The prototypes are developed as fast as possible and handed to sales people to be tested. The next prototype round is already started while testing of the previous is still going on. Often the first prototype is a paper mock-up and when the information increases the more high fidelity prototypes are developed on the spot. (Norström Innovation Lab 2011).

NIL is an example of the movable service prototyping space and tools. As essential, in addition to well-working tools is the methodology and way of working, including the prevalence of clear targets, tight timeframe, and entrepreneurial attitude.

Another example is SINCO's movable version. The main elements in the movable version are two light projection walls, projectors, and a scene computer. Along smaller devices like hand-projector or touchpad can be used. SINCO uses the movable version when prototyping on-site or in workshops. (Rontti et al. 2012).

2.5.7.4 Temporary locations

In the service prototyping cases presented in the literature, different temporary locations can be found. A service prototype is not built in the real service environment, but in temporary locations more or less similar to the real one. For instance, few cases on service walkthrough has been reported using these kinds of locations. One of them utilized large office building and different rooms illustrated the different service locations originally to-be located around the city (Blomkvist, Åberg & Holmlid 2012). In other example, a similar, but not real outdoor environment was used in prototyping (Arvola et al. 2012). The temporary location was used because the service probes were easier to install in the non-real environment.

2.5.8 Challenges in prototyping services

During the collection of literature I gathered different challenges mentioned by service prototyping practitioners:

- It is hard to recognize what are important things to be prototyped; for instance which elements brings the value and which are less critical (Vaahtojärvi 2010).
- It's hard to persuade prototyping among the stakeholders. This is two folded: Clients of the project, internal or external project owners don't see or know the possible benefits of prototyping, and designers don't know how to sell and motivate clients to reserve time for iterations. (Blomkvist & Holmlid 2010).
- Collaboration and motivation of customers and other stakeholders; How to get closer to consumers? How to collaborate across every part of organization? How to create a strong narrative that inspires key people and finally? (Samalionis 2009).
- Fear of failure (Samalionis 2009): How to conquer the fear of failure?
- Time (Blomkvist & Holmlid 2010); service prototyping especially in high-resolution level takes a lot of time. It seems faster to plan on the paper.
- Authenticity and validity of the test situation is hard to produce (Blomkvist & Holmlid 2010) and measure.
- Some of the service prototyping techniques are not good in terms of validity. For instance role-playing prevent on consider the real service experience. Personas characterize stereotypes of the stakeholders. (Turner & Turner 2010). To gain real reactions and evaluations from the customer perspective service designers should work with authentic people (Blomkvist 2011).
- It might be cost-intensive to model complex environments, for instance using the 3D environments (Meiren & Burger 2010).
- The knowledge how to prototype different dimensions of services is still rather unknown among the practitioners, especially challenges are raised on the intangible aspects of service - the experience and social interactions (Blomkvist & Holmlid 2010).

Besides the practitioners, there was found challenges identified by the service prototyping researchers:

- Holistic prototypes that combine multiple touchpoints are rare (Blomkvist 2011).
- Service prototyping do not have formed clear practices, which might lead to the fact that it is not done in systematic way (Blomkvist 2011).
- Prototyping the servicescape is hard because there are so many factors affecting on the experience of the client and the employees (Blomkvist 2011).

2.6 Summary of the literature review

In this study, the service is defined as in service-dominant logic. Service is considered as a process between two service systems that are influenced by the other service systems they network with (Vargo & Lusch 2008). In practice, these service systems are called customer and service provider or firm. From the design point of view, this means that the firms can only offer service propositions to facilitate and support the value creation of a customer (Grönroos 2011). These value propositions are configurations of different resources, both tangible and intangible (Maglio et al. 2009). The service prerequisites model (Edvarsson & Olsson 1996) is used structure the object of design. The prerequisites model includes three parts: service concept, service process, and service system (Edvarsson & Olsson 1996). The firm can design and optimize these service prerequisites, but design process has to include the customer perspective, and this is done with the help of experimentation. To succeed, the design principles are: user-centered, co-creative, sequencing, evidencing, and holistic (Stickdorn & Schneider 2010).

Experimentation, or evidencing, is a way to figure out what kind of value and experience a design will create. According to the Buchanau and Fulton Suri (2000), prototyping allows customers to react with the future instead of trying to make them imagine and think about it. The same applies to the designers; one cannot truly adapt to the users role, if one do not really experience it (Ibid). Having concrete and practical representation provides a common reference point and allows stakeholders to collaborate and evaluate design suggestions. By prototyping the team can identify problems early and save money and reduce risk (e.g. McCurdy et al. 2006). When something is truly novel and complex, it cannot be studied and planed it into existence. Planning relies on the facts known at the planning moment and that is not enough in the complex and uncertain business environment. (Lee et al. 2004; Tuulenmäki & Välikangas 2011). Experimentation is needed to learn through a trial-and-error process a piece by piece (Thomke, Hippel & Franke 1998; Ries 2011, pp. 37-55).

There are several process models discussed in this thesis. These process models complement each other. The design process includes four steps, which are exploration of needs and wants, ideation and concept creation, experimentation, or reflection, and implementation. The process of experimentation is an add-on for the service design process. The experimentation step is replace with series of steps: set the hypothesis, ideate how to experiment, build the experiment, run the experiment, and analyze the experiment.

To understand the practice of prototyping, it is important to be clear with the terms. Experimentation is used as general term for describing try-and-learn-mechanism utilized in the innovation process. Term prototyping is used when an idea is turned into physical representations and then tested (Blomkvist 2011). Additionally it is important to understand the difference between a prototype and prototyping. According to Blomkvist (2011), a prototype is an early embodiment, a representation or manifestation of an idea that is formulated in form of assumptions or hypothesis. Prototype is a medium to test an idea against specific

criteria, so to see if the hypothesis holds true. Compared to this prototyping describes the action and way of thinking. (Ibid).

Blomkvist's (2011) conceptualization of the service prototyping helps to understand the practical decisions relating to prototyping activity. Blomkvist's (2011) framework (2011) connects the position in the innovation process, purpose of prototyping, audience and author of the prototype, prototyping technique and its validity, and the prototype as representation and its fidelity.

Blomkvist's (2011) framework and definition of a prototype are used in clearing out the mess of methods discussed in literature. As a result of the analysis service prototyping techniques are presented in Appendix 7. Besides the techniques, good prototyping practices were determined based on the literature. Setting a clear hypothesis, setting a deadline, doing parallel prototyping and documenting the work are tested in the empirical study.

Additional challenge comes from the fact that each service encounter is unique in its nature and context (Vargo & Lusch 2008). Understanding the concepts of experiential value (Boztepe 2007) and value-in-context (Vargo, Maglio & Akaka 2008) are important in designing for service propositions. Designing the servicescape well is a way to manage the service experience by enabling the favorable behavior. The servicescape has to be taken onto account in prototyping in two ways: in selection of prototyping technique and in selection of the location where the prototyping happens. Service prototyping locations are affecting on the measurement of the experimentation success, also referred with the term validity of the prototyping (Passera, Kärkkäinen & Maila 2012). Different locations for service prototyping were mapped to gain knowledge for the empirical part where a service prototyping space is build and tested.

3 Empirical research

In the empirical part of the study, the experimentation-driven innovation approach is brought into practice. Based on the findings of the literature review, there is not much practical knowledge on the process of experimentation-driven innovations and tools to support that. The aim of empirical cases is to understand how the experimentation process proceeds, and test what kind of practices and tools support the process. The data set for this is gathered from three innovation cases and interviews of the case participants.

As a part of the empirical research, a service prototyping space concept will be created and methods will be developed to facilitate service prototyping. The space is titled as Act Out of the Box Center, more shortly referred as AOBC space. The hypothesis is that services, especially the ones depending on a physical location for their provision, would benefit from a safe space for prototyping and development in the beginning of the innovation process. Service prototyping space is used in the innovation cases, and with these experiences, the second research question is addressed; concerning how the service prototyping space can help prototyping and when it should be used. In the Figure 1 in chapter 1.4 timeframe of the project is visible.

The chapter 3.1 presents the innovation cases, how they were done and what were the final concepts created during the process. The chapter 3.2 presents the result of cross-case analysis. It starts with revealing the service prototyping space concept created during the cases and continues discussing commonalities and differences of the cases considering the innovation process, prototyping techniques, practices and environment.

3.1 Innovation cases as data set

The empirical data of this study was gathered from three innovation cases summarized in Table 5. The innovation team consisted of researchers, students or summer trainees of the MIND research group. Additionally some partner organizations representatives took part to the design activities in cases 2 and 3. The researcher was participating in each case either as member of the design team (case 1, 3), or as tutor and observer (case 1, 2) of the design teams consisting of students and trainees.

The data was collected as learning diary and weekly discussions with the design team. Additionally interviews of the co-developers were conducted before and after the projects (more information of the interviews in the research method description 1.4.1).

All of the cases aimed to create novel service concepts for a certain industry instead of improving an existing service. The experimentation-driven innovation approach was utilized to explore and form the innovative concept. It was essentially a mental model for working, meaning there was a continuous boosting towards experiments as early as possible without lot of planning to consider what to do. The scope of all cases was limited to the early phase of the innovation process.

Table 5 Sum up of the action research cases

Case number	Name of the case	Case description	Time	Role of the researcher	Interviews
1	Nightclub	Developing service concepts to innovate the nightclub industry	04-09/2011	Action research: designer, observer	2 design team, no client representatives
2	Best park in the world	Developing new services and activities to enhance the experience of a city park	06-08/2011	Action research: designer, observer	2 design team members, 2x2 client interviews
3	Immaterial shop	Developing a shop that sells immaterial gifts	09-12/2011	Action research: designer, facilitator	1 design team member, all together 9 client interviews

Next, the three action research cases will be presented to create holistic picture of what experimentation-driven innovation process can be in practice. For each case, the aim of the case will be introduced along with the challenge formed. This should help to understand what is the starting point of the innovation process, how open the challenge can be. After it will briefly be explained who was involved and how much they participated to the prototyping. For each case, there will also be a discussion of the experimentation process, prototyping practices and techniques used. The end result of the innovation process will also be presented.

3.1.1 Case 1: Rocking the nightclub industry

Rocking the nightclub industry was an innovation project that aimed to challenge the nightclub industry in Helsinki and develop strategic service innovation in nightclub context. The innovation project started in March 2011 and ended in September 2011.

Research wise there was two objectives for this case: first to explore how to take the experimentation-driven innovation approach into practice and second, develop the first prototype for the service prototyping space and test it during innovation process. The prototyping space concept is presented in the chapter 3.2.1 and the development story can be found in Appendix 9.

3.1.1.1 People involved and their roles

People involved in this case can be divided in two groups: the design team and the people who participated to the testing of prototypes. From March to May, the design team consisted of three MIND researchers. In May, two summer trainees started working with the case and they took the case over from the previous team. In this action research case, the researcher worked first as designer and then as observer of the second design team.

Besides the design team, people participating in experiments had important roles. All together, around 200 persons participated in the experiments as testers.

3.1.1.2 The experimentation process

After the case seven activities were identified that were included in the process. The short description of the activities gives an overview to the process:

1. **Industry analysis** included defining the conventions and visualizing the conventional consumption chain. After a couple of iterations, the team defined reasons why people go to nightclubs and based on the industry analysis they chose one of the reasons as their design target. The target was framed as a question: "How to support meeting new people in a club?"
2. **Case specific AOBC space modifications:** In the beginning just certain basic elements were considered to provide nightclub look and feel, including colorful lights, music equipment and shiny fabrics. Later in the process, the team intended to develop the space so that it provides more in terms of look and feel as a nightclub.
3. **Ideation:** The team worked hard to develop ideas to challenge the status quo of the nightclub industry and find ways to provide more value to the nightclub customers. Figure 14 illustrates the variety of the ideas team had. During the process around 170 industry-challenging ideas were developed.
4. **Rough experimentation of the potential ideas:** Rough prototypes were done in the AOBC space through utilizing body-storming, role-playing techniques, and developing different servicescapes. For instance, the team tested five different layouts for organizing blind dates in a bar. All together, approximately twenty-five ideas were tested on rough level.
5. **Concept experimentation:** Five different concepts were formed and tested: Blind date concept, Associate Casino, Wingman, MindClub and Houseparty club. All together ten concept prototypes were created.
6. **Experience tests:** Two of the concepts were tested in more real and authentic service environment. MindClub, a networking club concept, was tested two times and Houseparty club once. MindClub was tested in a lounge bar in the city of Helsinki. In MindClub tests more than 80 people were involved. Houseparty club was tested in multifunctional Design Factory building modified as a large house party space and nearly 100 guests were testing the concept. These prototypes aimed to validate the idea in more realistic environment and to provide insight on the experience and value-created with the service proposition. These prototypes can be considered as experience tests (Moritz 2005).
7. **Creation of the video narrative:** Case was documented in a video format attached in Appendix 8.

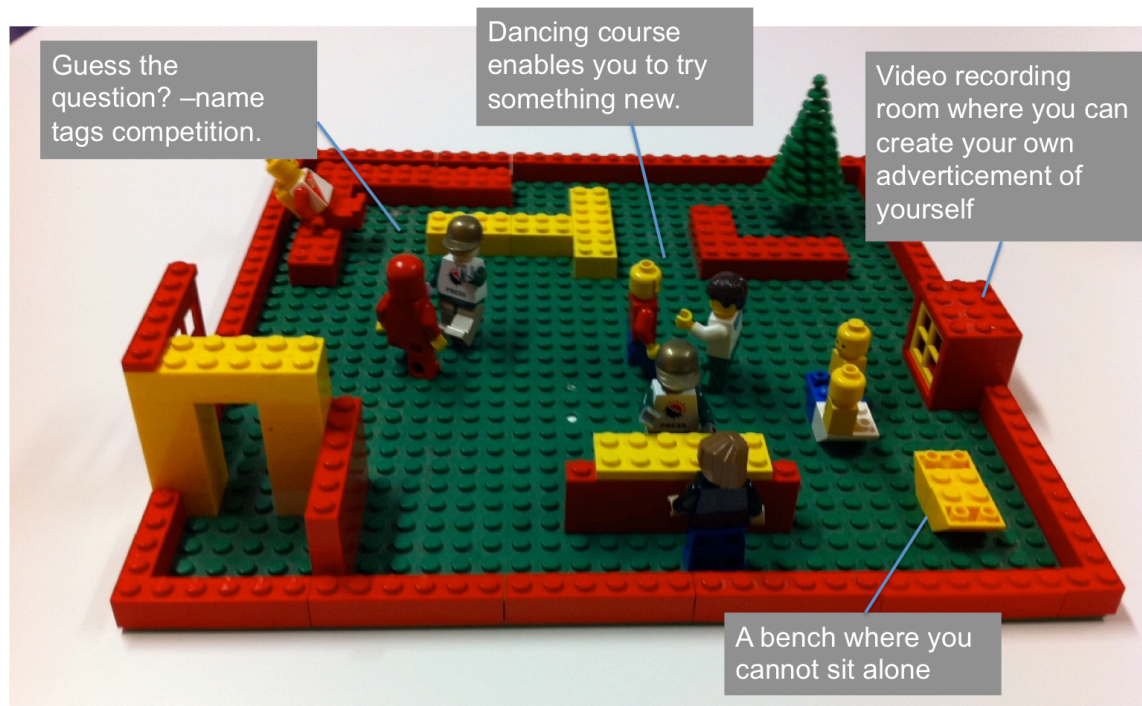


Figure 14 Examples of ideas that support meeting new people in a nightclub

Based on the researcher's experience as a member of the design team and based on discussion with the rest of the design team, the project proceeded slowly in the beginning. The design team spent most of the time doing industry analysis and ideation on how to renew the industry. The team produced few vague and rough prototypes in AOBC space with different topics, see Figure 15, for instance, the team created a pre-party lounge room for girls to get ready before the clubbing, a home-delivered pre-party set, a mask party and blind date systems with different kind of bar layout settings. The design team felt that they did not make much progress overall; each time they had to go through the whole process, do some industry analysis, ideation, pick up an idea and quickly push it to a prototype. One of the reasons was that the team had timetable problems. The team had challenges to find enough time together to produce the prototypes and test them in AOBC space. The researcher determined the need for at least one person to assist in building and planning the concept and running the experiment in AOBC space and on the field. When the design team was finally brought together, the sessions took longer than planned, and many times the process was cut off in the middle. There was several days pause after a previous round before they manage to get back together again. One of the reasons for these delays was that two of the design team members were doing this design project besides their own projects.



Figure 15 Prototyping of nightclub ideas in AOBC space

To develop focus and avoid jumping from one idea to another, the design team decided to narrow the scope of the project in the beginning of April. The team explored the possible reasons why people go to nightclubs, and selected the one which seemed to have too little support from the existing offerings. Further on, the aim of the design was to create bar concepts that make people to meet new people and interact. After this decision the team had goal to which they could compare their ideas and designs. It was easier to analyze the prototype success; did the prototype manage to make people socialize or did it feel unnatural? Additionally I could notice the researcher noticed that there were any more disagreements about which idea seems promising, or what was supposed to be tested. After the project it was noted that this decision gave a boost to the overall progression of the project.

Generally, the team felt that it was hard to bring the ideas to reasonable prototypes in the AOBC space. After some troubling sessions, the team considered that one of the problems was that they just had a vague idea, which they then tried to prototype with body-storming techniques. They realized that it would be reasonable to prepare the concept a bit more before starting the prototyping. Questions like "How would the service work?" "What kind of service environment would be needed?" "How would the customer know how to behave in the bar?" were asked before building the prototype setting. The team thought that using ideations, sketching or storyboarding would help to produce common sense about the idea. The teams proceeded using a bit more time for preparations and low-level prototyping with Legos and sketching.

As a result of changing the prototyping practices and techniques, in April the team managed to build their first holistic conceptual prototype, called Associate Casino, in AOBC space. It took around two days to build it and pre-test it before it

was tested among 15 people who did not know each other but had a common interest to get to know each other.

After this prototyping session, the new design team started working with the case full-time. Instead of giving the same wide brief, the earlier design team formed a concrete brief to the new design team: Design a night club which would add interaction between customers. The team was given a first deadline right away: a first concept to be ready in three days, so that it would be testable in AOBC space.

The new team managed to get to know the industry, ideate and produce three prototyping sessions during these three days, resulting with a testable concept prototype. Based on the learning got from the first week, they continued developing new concepts with a new deadline: an interactive bar concept for business people that can be tested in one and a half weeks in a real service environment.

Both of the teams noticed early in the process that it was impossible to create service environments that looked realistic in the AOBC space, get a look at Figure 15. At this point the AOBC space was made to look and feel as nightclub as possible with equipment available. The comments were that it was impossible to fool the human eye and during the testing. It was noticed that testers needed to use their imagination and adapt to the situation. The team also considered it wasting time to test the prototypes in realistic timeframe meaning that they would invite people to spend their free time "bar evening" in the cellar prototyping room that was kind of illustrating a bar (DT_KH.1 & DT_JT.1). The teams reasoned that in some point there is need to go to a more realistic environment to get a more realistic experience test for the new design. Therefore the strict deadline was set to the first on-site prototype.

The second team spent first days by testing different networking concept in AOBC space. The last three days the team spent preparing the details of the on-site prototype, making brochures, and materials for the activities, all the things needed to change the existing bar to illustrate this new bar concept.

Over 40 people participated to the on-site prototype testing, which proved that some of the ideas were working. The team got a picture of the holistic nightclub experience, how people would act, consider and feel. The feedback of the new concept was promising and all the replies (only six were received) indicated that participants reported speaking more than normal bar night and finding interaction with strangers easier. To verify the details of the concept the second on-site prototyping round was organized several months later in the beginning of September. The second round confirmed that there was potential in the concept and the team had managed to find a combination of details that form the new service concept, presented in the next chapter.

After the first experience test the team started working on the second concept with same target, getting people to interact in the bar, but now the target audience was normal bar users. After getting the home party idea, they proceeded rather quickly to the concept prototyping in AOBC space.

Although the new concept demanded changes in the general look and feel of the AOBC space, it took only three days to prepare the home party look-like prototype visible in Figure 16. The team iterated couple of choices relating to the layout and the essentials of the concept with creating servicescapes in AOBC and body-storming with them, and prepared a plan for experience test.

Due to the summer holidays, and difficulties finding enough testers and booking the Design Factory as an on-site testing venue, the actual on-site testing session was held in the end of August. The time period from an idea to the on-site testing for the second concept was long from calendar point of view, but in work-hours it was effective, approximately 60 hours.



Figure 16 Houseparty servicescene created in the prototyping space

3.1.1.3 Experiences on the prototyping techniques and environment

At this phase of the project, the design team did not have much experience of the prototyping techniques. The project was a learning process as far as the conversion of theory into practice was concerned. The design team tested different service prototyping techniques in AOBC space and in real service environments to map out how different techniques support experimentation-driven innovation process and how should the techniques be used. Other techniques mentioned in the literature review (chapter 2.5.4.4) except creating scenarios were tried out and analyzed.

For prototyping the potential value opportunity ideas, most of the time the first prototyping technique was sketching, followed by improvisation theater or cognitive walk-through in AOBC space. The observation showed that these techniques don't require a lot of preparations, equipment or tools, nor the details of the service are needed. It was noticed that these techniques could be used for

pretty vague ideas. During the prototyping the prototypers have to make them more concrete.

After the vague first prototyping rounds, the most promising ideas were prototyped on the next level. Service walk-through and building the servicescape mock-up and role-playing were service prototyping techniques used to create more holistic service prototypes. Holistic prototype means that more dimensions were included in the prototype. Each prototype needs many kinds of implementation decisions. Because a full-functioning service consists of tens or hundreds of this kind of decision, the team intuitively concentrated to prototype those aspects that differ from the current offerings, instead of getting the whole service prototyped. This helped to keep the prototypes light enough to handle quickly and bin-point the new dimensions. Intuitively, the fidelity level of details was still rough, because it was a first experimentation round including many dimensions. Figures 17 and 18 show examples on the servicescape mock-ups and the design team testing them.

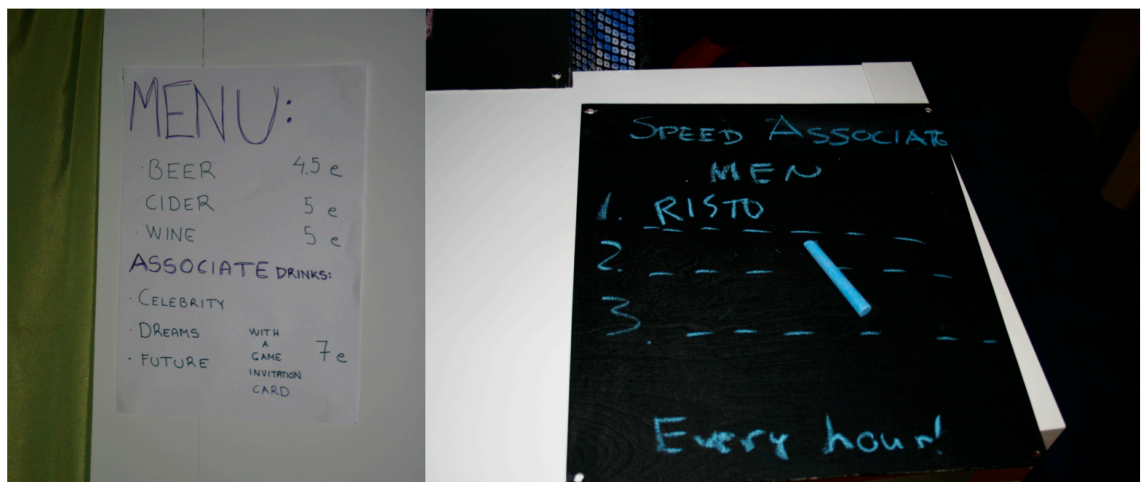


Figure 17 Examples on how information was brought as part of the servicescape prototype, on left there is menu behind the Associate bar and on right there is booking form for blind date



Figure 18 Design team body-storming the blind dating concept in AOB space

Both design teams felt that the prototyping took always longer than they expected and was found very hard to start and finish. The team found it hard to know when to proceed to the next level of prototyping; from opportunity ideas to conceptual prototypes and from conceptual prototypes to experience testing (DT_KH.1 & DT_JT.1).

Besides utilizing AIBC space the design team did three experience tests in real service environments. The first on-site prototyping round was a tough slog for the team. Both interviews of the second design team (DT_KH.1 & DT_JT.1) told that it took a lot more work than estimated. The time spend to the details of the prototypes was enormous compared to the time that was needed to produce a rough concept prototype in AIBC space (DT_KH.1 & DT_JT.1). For instance in the MindClub three prototyping rounds were done just for the “mission impossible card”, see Figure 19, which were given to the customers when they entered the bar, and that was just one of the details included in the experience test. These prototypes can be considered holistic service prototypes, considering the whole service process, service environment and service experience.



Figure 19 "Mission impossible?" cards: upper picture is the final experience test prototype, on left is the first prototype and on right the second prototype

During the experience tests, the team learned that in on-site prototyping it is harder to change things during the testing, to adapt to the situation, therefore the decisions on the details are more important than during the AIBC space prototyping, where you can modify the prototype even during the testing or pause the testing situation (DT_KH.1). Because the point of experience testing is to provide as real experience as possible to the test persons it is probably vice to use it for concept verification, when the concept seems to be more or less formed.

In the end the interviews of the design team concluded that prototyping got easier the more they had gained experience, but still one needs a lot of energy and enforcement on mental level to get on going. Learning the practices and the

process helped in preparations, for instance the second on-site prototyping session for the first concept was easier and faster. (DT_KH.1 & DT_JT.1).

3.1.1.4 Prototyping practices utilized

During the nightclub project the development team got experience on three of the four practices mentioned in the literature review (chapter 2.5.6). Additionally were two important things mentioned already that could be considered as prototyping practices. Table 6 summarizes how the practices were implemented.

Table 6 Prototyping practices utilized in nightclub case

Practices mentioned in literature	The nightclub case implementation
Formulizing a clear hypothesis	The team did not set a clear hypothesis, but tried to define targets for the test in style: "What am I testing?" "Does this increase communication?"
Set deadlines and targets	The second design team utilized strict deadlines to outline the work. Example a conceptual prototype has to be ready within three days. A new deadline was set after the last target had been accomplished.
Documenting	There were some attempts to build a documentation library with a folder and fill-in forms. Video documentation of the prototyping sessions was taken when there were external testers involved.
Parallel prototyping	None. The AOBC space did not offer enough space to have parallel prototypes of this subject.
Practices identified in the case	
Narrow the scope of ideation	Narrow the scope and concentrate your ideation and prototyping on the certain topic
Prepare yourself for the concept prototyping.	Ideate and prototype roughly by sketching and storyboarding different aspects of the service before building the service setup.
Prepare your testers	Prototypers gave a short brief to the test customers before they step in the testing area. This helped them to adapt the situation.

In this project, the design team did not manage to set clear hypothesis for their prototypes. The teams were so eager to push their ideas to the prototypes that sometimes they forgot to ask themselves "why are we testing this?". Later in the project, when the team started preparing themselves more for the concept prototypes, they also started formulating questions like "Do people interact more?" or "Do people talk to strangers?" These questions helped to analyze the prototyping.

In the interviews, the new team members (DT_KH.1 & DT_JT.1) had a lot of comments on the timetable and the deadlines set to their project. They felt really stressed during the first weeks. There was so much to learn, and the tutors demanded a lot from the design team. The designers said that strict deadlines and given subjects, restricted their innovativeness and forced them to work directly towards results. They were afraid that some of the good ideas, were left without testing. They agreed, however, that it was an only way to get some results so quickly. Short time frame pushed the team to take the first good ideas, and start testing them, learning how to prototype and test prototypes. (DT_KH.1 & DT_JT.1).

The teams tried different manual ways to document the prototypes. First some notes were done after the prototyping session. The second attempt was to provide ready-made form where the prototype could fill in the details of the prototyping session (see Figure 20). Observation showed that there were a lot of problems with that format. The prototyping activity itself is hectic, and the analysis started right after or even during the prototyping, and the prototypers did not remember to pick up the form. When there were external testers involved, the prototyping session were also filmed. The filming was also challenging, because the AOBK space did not have fixed video documentation equipment, and the films needed to be shot by one of the design team members. Many times an extra assistant would have been needed to take a video and do observations, because all of the design team members were needed in the prototyping activity itself. A new practice for documentation should be created.

Proton nimi: _____ Päivä: _____
 Tekijät: _____ Valmis-tuu aika: _____
 Testaajat: _____ Testaus aika: _____
 Prototyyppi-metodi: _____ video kuvat

IDEA	IMPLEMENTOINTI	kyllä	KOMMENTIT

Opit: _____
 Seuraavat sikit: _____

Figure 20 A prototype documentation form

Narrowing the scope of the case subject and making decisions is one of the prototyping practices that support the process. The decision, which the first design team made in the beginning of April, about concentrating on creating a service that

increases interaction narrowed the scope of the project significantly. Until that point, the ideas varied a lot and this made it really difficult to compare the solutions and to learn from the previous prototyping rounds. The decisions enabled that the team could start looking for a best possible way to support the interaction instead of looking for the convention to be challenged.

The second learning was that the team should prepare themselves to the concept prototyping. Ideating and prototyping roughly by sketching and storyboarding different aspects of the service before building the service setup help in designing the more holistic prototypes.

One practice learned relating to the prototyping in AOBC space was that it is important to prepare testers. The prototypers gave a short brief to test customers before they entered the prototyping space. The brief can include the mood, the location and a description of need. The brief created the nightclub context, which was rather far from the real situation because most of the tests were done during the daytime. This helped the customers to adapt to the situation, but still it demanded a lot from their imagination. In the brief, the team also created imaginative intensions by, for instance, asking the tester to imagine that they came to the bar to look for a new prospective girlfriend. This enables testing several customer profiles with same people.

3.1.1.5 The end result of the experimentation process

This project produced two concepts for making people interact in the nightclubs. Both of them challenge the industry conventions and aim to realize the value people are looking for when going to a nightclub. A video, attached in Appendix 8, gives a peak to the project, to prototyping and the end-results.

The first concept established MindClub, which is a networking club for a group of people, who have certain interests in common, for instance a hobby or profession. It can be either an event or continuous concept for a bar. It includes activities, examples in Figures 21 and 22, and service aspects, which make people to interact more and find similar-minded people. This concept challenges the role of the service provider; they provide more activities to customers. It also narrows the customer segment, but it offers them better fitting experience, which is considered to make them more committed users.



Figure 21 MindClub offers activities such as games where people need to communicate with each other



Figure 22 These two activities, a human library (on the left) and Associate game (on the right), were trying to help people to find similar-minded and interesting persons to co-operate with

The second concept is called Houseparty club. House parties tend to make people to interact more and create more valued experience compared to a regular nightclub (DT_KH.1 & DT_JT.1). The idea is to provide spaces for organizing house parties in the same building. This non-housing environment offers reduces the burden that party organizers have at home, reduces risks and potentially more space to invite more people that the home would have. It renews the marketing activity. Clients are responsible of inviting their guests, see an example email in Figure 23, it offers new business revenues from the room reservations, reduces service personnel etc. The kitchen like bar area, illustrated in Figure 24, is one of the things that make people to feel like home. In this concept, different activities are also provided and party people generate those themselves also like in Figure 25 where this group of people started playing “Guess who” game.

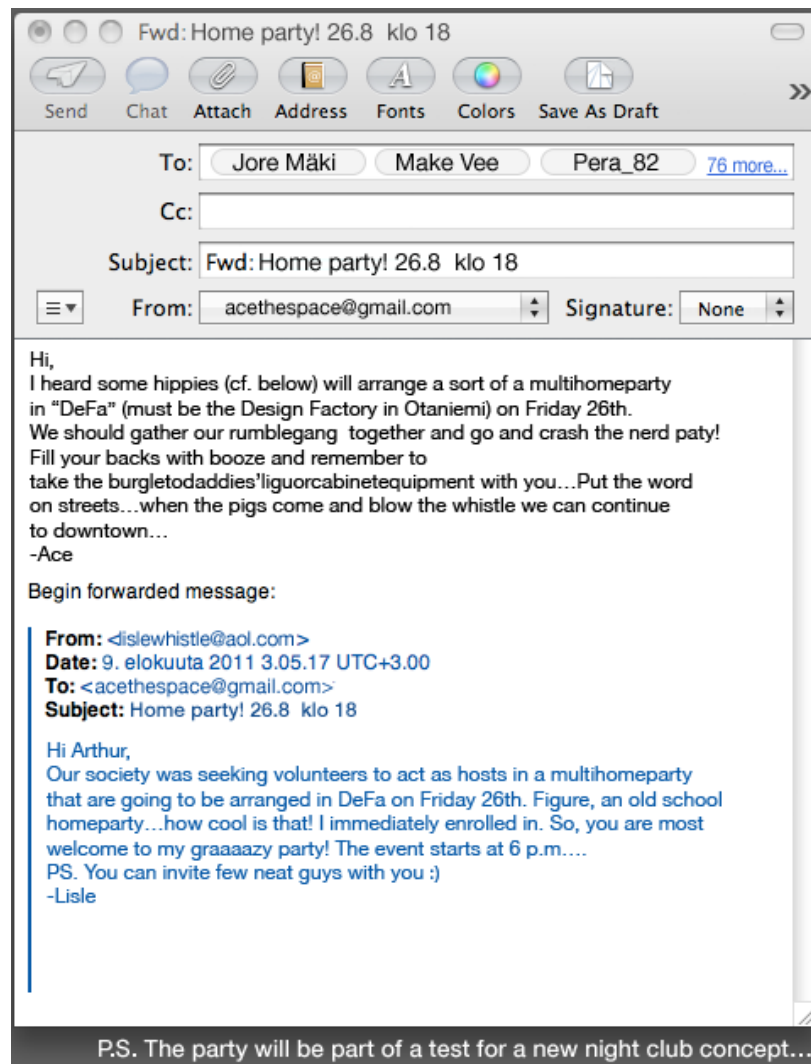


Figure 23 An invitation email that customers could use in their marketing



Figure 24 Kitchen area is the heart of home parties, therefore in this club concept the bar should look like a kitchen



Figure 25 One group of customers started their own game during the evening

3.1.2 Case 2: Creation of the best park in the world

A public park in Helsinki, managed by the city of Helsinki, received negative attention in the local media in the past few years. The main problem was the youngsters who gather to drink in the park. They were seen as being noisy, trashing the park, and thereby disturbing other park users as well as the residents of the houses near the park (e.g. Arvila, 2010). Due to these negative developments, two of the park's stakeholders, organizations such as, for example, a cafeteria located in the park and the previous owner of the park (a brewery after which the park is still named), initiated a research project to solve this disturbance and enhance the park experience.

The aim of the project was an ambitious one: to create the best park of the world (C_KimH.1 & C_TT.1). MIND research group approached the challenge by generating ideas and experimenting those instantly in the park - with the users of the park. The aim was to change the behavior of some of the park users through changes in the surroundings, services and other elements of the park. Hence, it was essential to experiment with the alternative solutions in the park itself. It was also crucial that this development case was visible in the park and as transparent as possible.

The timeframe of the project was short and predefined, one month for preparations and one month for experiments.

The research focus in this case was to bring the experimentation-driven innovation in to practice and gather experiences on how to do instant, rough prototyping directly in the real service environment. In this project the AOBBC space wasn't used at all, because the park wasn't a service environment that could be easily simulated in a service prototyping space.

3.1.2.1 People involved and roles

The development team consisted of two summer trainees who were familiar with instant experimentation method because they were also involved in the first case. The role of the development team was to bring the ideas to practical level, do the actual experiments and collect the results together. The role of the researcher in this project was to be a tutor to and observe of the work of the design team.

The experiments were done directly in the park and the testers were random users of the park. Experimentations "touched" more than 400 persons during the 2,5 weeks experimentation period in the park (DT_KH.2 & DT_JT.2).

The initiators of the project were involved in pre-ideation and setting the goals for the project and afterwards of the result analysis. The cafeteria partner was somewhat involved in the experiments but more as a facility asset for the experimenters. Ideally the case clients, as representatives of the service provider, would have been tightly involved in the service development. Already, in the beginning, it was noticed that intensive working method in this action research case and the timing in the middle of the summer holiday season didn't fit together with development and decision-processes of the case client organizations. The representatives were also working at the management level; consequently they

were looking for gaining experiences about the ideas that they consider investing later, instead of being interested in how the experimentation was really done (C_KimH.1 & C_TT.1).

3.1.2.2 Experimentation process

The development process consisted five activities:

1. **The initial background research** was done by interviewing the case initiators and spending time in the park observing its users.
2. **Initial idea generation & idea selection:** In the initial ideation phase 10 concept ideas for improving the user experience of the park were developed together with project initiators in short workshop. The initiators of the project and design team formed five themes for the experimentation phase.
3. **Preparation for experimentation:** Preparations included, for example, collecting materials such as games and painting equipment to be loaned to the park users, building physical elements for experimenting with potential new services, e.g. a kiosk structure that functioned also as a communication channel towards the park users, visible in Figure 26.
4. **Idea experimentation:** After the preparations design team placed themselves daily to the park to do the experiments. To go beyond the experimentation hurdle and to avoid over-preparations design team set themselves a target to experiment something new each day. (DT_KH.2 & DT_JT.2).
5. **Improvement and iteration:** Each conducted experiment provided new understanding and new ideas. Successful ideas or ideas which still seemed to carry potential were further improved and failed experiments were documented and left out of the following iterations.

In total, 50 experiments were conducted during a two-and-half weeks of period. The team managed to create experiments to explore three of the five themes set in the beginning. They explored solutions for the trash problem and for the social branding. They placed the traditional Finnish hot water tub in the park. Two of the themes set in the beginning were not realized as experiments. Organizing outdoor movies ruled out because the original idea was impossible actualize during the light summer nights, neither anything similar ideas were invented to cover this subject. The team did not manage to test the open stage concept to boost socially organized cultural events in the park. They tried to get a permission required by law from the city officers for this music event and the authorization process was too slow. The experimentation period ended before permission was obtained. (DT_KH.2 & DT_JT.2).

One of the original conceptual themes related to building a social brand, so called Our Park –concept, to make the users themselves take more care of the park and to create a certain feeling of pride over the park – to involve its users emotionally to look after the park. Experimenting this concept included providing t-shirts for those who took care of the park or participated to the happenings arranged in the park. The t-shirts became rather popular and were seen in bars in the Helsinki throughout the summer. Also several games and other activities were provided to the park users via a kiosk. This kiosk turned out to function as a

coordination place for the activities and for park users to give feedback and provide ideas. (DT_KH.2 & DT_JT.2).

Another concept prototype related to creating a new service concept for the cafeteria in the park. One of the ideas experimented within this concept was to bring a very typical Finnish “palju” – a hot water bath that fits several people – on the terrace of the cafe. Figure 27 shows the sketch of the “palju” concept, and in 28 and 29 the hot water tab is tested in the park. Different experiments relating to the price and marketing of the “palju” were experimented. However, although the initial market research showed great interest towards having a hot pool in the park, at the end it did not receive many users during the experiments. The need to swim while having a coffee proved to be nearly non-existing. Nonetheless, even when the initial idea did not succeed, another idea was born out of the experiment; if the café holds private parties, the “palju” may well be a valuable addition. (DT_KH.2 & DT_JT.2).

There were few experiments related to the trash problem. Based on the observations during the initial research, the problems that had received most attention in the media were not the key problem at the start of this project, because the city had already taken necessary steps to improve the situation. The most significant remaining problem with tidiness was the cigarette butts left over by the smokers (DT_KH.2 & DT_JT.2). To tackle this problem, movable ashtrays visible in Figure 30, were created and handed out to park users. It proved to be a hit and no one refused to have one (DT_KH.2 & DT_JT.2).



Figure 26 The kiosk worked as storage for park activities as well as an idea channel



Figure 27 Design team sketching the hot water tab, "the palju", idea



Figure 28 The hot water tab ready to be used in the terrace of the cafeteria located in the park



Figure 29 Park users testing the hot water tub in the park



Figure 30 A prototype of an ashtray for park users

3.1.2.3 Experiences on the prototyping techniques and environment

In this case all the prototypes were done in the real service environment. Most of them were kept simple, just prototyping simple idea. The main purpose was to explore the experience of the users in real service environment, so the prototypes can be considered experience prototypes (Suri & Buchanau 2000). In practice the prototyping meant that a mock-up or a prob was provided to the customer to be

used. Design team activated the customers to use them and observed their reactions. For instance in Figure 31 a park user is testing the painting equipment that were available in the kiosk.

To be clear with terms, this study considers only the hot tub service prototyping as an experience test (see Appendix 7) because it is the only one testing a holistic concept in the real service environment with real users. The other prototypes include more or less single ideas tested after each other to find seeds for enhancements.

The park, as real service environment, was a challenging prototyping environment, because it was open all day long. The park audience changed during the day many times. For each prototype the audience was different, so modification and alternatives for the same idea, where not tested with same people. (DT_KH.2 & DT_JT.2). The design team said that being in the park all the time with audience was tiring and demanded lot of social skills and endurance. Direct contact to the testers was also not possible all the time. The feedback was got directly only from the most active park users and mostly by observation (DT_KH.2 & DT_JT.2)

The existence of the audience also affected to the preparations needed. The prototypes needed to be so polished that every park user could understand them themselves. The design team also considered that they could not as easily vary and play around with different solutions than in AOBC space. (DT_KH.2 & DT_JT.2)



Figure 31 A park user testing the painting equipment

3.1.2.4 Prototyping practices utilized

Table 7 demonstrates the analysis of how different prototyping practices were utilized during the case.

Table 7 Prototyping practices utilized in park case

Practices mentioned in literature	The park case implementation
Formulizing a clear hypothesis	The team did not set clear hypothesis before the prototyping, but the team kept in mind a general question: "Does our solution enhance the park experience?"
Set deadlines and targets	A project timeline was created before starting of the project; one month for ideation and preparations, one month for experimentation. Additionally the team had a goal to prototype something new each day.
Documenting	The team still tried to use the same manual documentation format, but in the end just few shappy sheets were left. After the prototyping period the team further analyzed each experiment and documented it in electronic format. The video documenting was done when permissions from the park users was asked and gained.
Parallel prototyping	The park environment was suitable for prototyping multiple small ideas at the same time. Small number of design team members, two, restricted how many things they could handle at the same time.
Practices identified in the case	
Narrow the scope of ideation	The initial ideation produced ten different themes, from which five were chosen to be experimented.
Prepare yourself for the concept prototyping	The design team ideated the implementation ideas with sketches to the themes quickly in the beginning, and then proceeded in to collect materials and prepare the prototypes.

The parallel prototyping (Dow et al. 2010) was tested in this case first time. The themes of the prototypes were set all in one time after the ideation with shareholders. The aim was to prepare all of the prototypes at the same time, and then run the testing either in parallel or one after each other in the park. The design team, though, did not manage to prepare all of them in the beginning because they utilized so much time on building the kiosk. This lead to the situation where they should have run the prototypes in the park and do preparations, like reserving music equipment and sending permission applications in the park (DT_KH.2 & DT_JT.2). The two design team members were not enough for all this. The team members suggested in the interview that if there is on-going prototyping activities, there should be an extra person to provide the prototypers materials, prepare the next prototypes and help in organizing things. (DT_KH.2 & DT_JT.2).

3.1.2.5 The end result of the experimentation process

Main results from the conducted experiments were that the users of the park have many ideas for making the park better, and these ideas merely needed a facilitator (the research group) to collect them and act on them. The missing link thus far had been a mediator, and having one became the key aspect of the service concept developed at the end. Having a visible mediator in the park, see Figure 26, and, for example, having storage for the utilities of the park users proved to create significant good will among the park users, see Figure 32, – which resulted in a better user experience for all. (DT_KH.2 & DT_JT.2). Thus, in the end, this mediator or park host concept was born via the experiments and was proposed to the clients to be continued with. The video attached as Appendix 8 presents the key findings and the final concept.

The next spring, in 2012, there was an offer for a summer job for two candidates from one of the initiators in the local newspaper. The job description corresponds the results of this innovation project. Already, after the project was presented, the case initiator considered that the experimentation process gave them significant knowledge of the customer and the customer's needs, that they could not have gained anything significant with interviewing or observing. It also gave a concrete concept to invest in. (C_TT.2).



Figure 32 Prototyping in the park needed social skills and active mindset

3.1.3 Case 3: Development of the immaterial shop

This case describes the innovation project undertaken with three partner organizations; an environmental information center of the city, a communal garbage service operator, and recycling center operator. The aim was to find an immaterial shop concept to reduce consumption and make people feel that they could gain additional value through reduced consumption, instead of feeling that they were giving up or reducing something.

Compared to the other project, the idea of an immaterial shop existed in the beginning of the project. This idea itself challenges the industry status quo in two ways. First it would offer a totally different way to guide people to consume less compared to the traditional communication methods these organizations were using. Secondly, the convention of the shops was clearly to sell material things; there is no shop for that sells intangible gifts.

An experimentation-driven innovation approach was used to explore the implementation possibilities and find the execution ideas for the immaterial shop concept.

There were three research objectives for this case. The first objective was to test the AOBBC space concept with partner organization representative who did not have experience on prototyping. The second objective was to develop experimentation exercises and tools to facilitate the process of experimenting in service prototyping space to allow everybody to participate in the process and be involved. The third objective was to determine how the experimentation-driven innovation model might be put in practice.

3.1.3.1 People involved in the case

In this case, the development team consisted of two MIND researchers, who were mostly responsible of the prototyping and organizing the common session with case clients. The researcher acted as designer, facilitator, and observer during the case.

For each partner organizations two to three representatives were involved in the process. The representatives were participating in the design workshops. The pre-questionnaire results showed that none of the representatives had experience in experimentation or service prototyping. A total of 20 people participated to the development activities. An additional 40 people helped to test the prototypes.

At the end of the project, the representatives of the case organizations were interviewed and they had various opinions about who should have been involved. The case clients considered that it was hard to know who they should involved to the process, because the topic of project was so open in the beginning (C_MV, C_K-LH). In an interview after the project, one of the participants said they were perhaps not the best people to be involved in the process, at least not from within their organization (C_MV). Most of the participants were specialists of certain environmental issues within their organizations (C_MV). According to the one participant, however, a better choice of person to be involved in the process would have been someone either more familiar with the content of concept, meaning the

waste reduction or service personnel, or someone able to understand the ideas and concepts to the company's organizational strategy (C_MV).

3.1.3.2 Experimentation process

The development team utilized experimentation-driven innovation approach to explore iteratively challenge given and find solutions for it. The series of collaborative workshops set the pace for the design process. Between workshops, the design team analyzed the results of already completed workshops, edited based on the analysis, and prepared and experimented with ideas and concepts to be tested in the next workshop. The outline of the process was as follows:

1. **Kick-start ideation and concept sketching workshop** to gather information on partner's expectations, wild concept ideation, and rough prototyping with the help of 4Boxes sketching exercise.
2. **Rough prototyping workshop** including Mindwalk and rough artifact prototyping.
3. **Concept testing workshop:** six immaterial shop concepts were tested systematically.
4. **Experience testing workshop:** two of the best concepts were tested in the real service environment.
5. **Final concept presentation and evaluation workshop:** The final concept was presented by the design team and evaluated by the client representatives. Also business model and implementation plan was drafted.

3.1.3.2.1 First development patch

First kick-start workshop gathered information on the client partners, their business and expectations relating to the project. It was still open what would the immaterial shop sell; or what kind of shop would generally be. Wild ideation was done together with the partners. The most interesting concept ideas were developed further and prototyped using 4 Boxes sketching exercises (see Figure 33) and Dream Theater exercises (for exercise descriptions see Appendix 10).

During the first working period, three concepts were developed in AOBBC space. Gifts seemed to be the most promising object for selling in the immaterial shop and therefore they were chosen as the topic for the rest of the process.



Figure 33 4 Boxes sketching exercise in progress

3.1.3.2.2 Second development patch

Second, *rough prototyping workshop* was organized in AOBC space in Otaniemi. First, the participants did a MINDwalk exercise (see Appendix 10) to create an imagined service experience of immaterial gift shop in different user situations. The aim was to gather many implementation ideas and empathize with users of the service proposition.

In the second exercise of that day, the participants developed rough prototypes for how the immaterial gifts would be given or presented to the customers in this immaterial shop. The prototyping was organized as an exercise where the participants produced as many ways to present the gifts as possible in the given timeframe. They could utilize all the equipment and materials available in AOBC space. Some of the prototypes are presented in Figure 34.

After the second workshop, the design team analyzed the Mindwalk prototypes and gathered the implementation ideas. The design team produced six different shop concepts and prototyped them in AOBC space. Prototypes were tested internally with MIND researchers and with a group of entrepreneurs to prepare the ideas for the next workshop with client representatives. Figures 35 and 36 illustrate the differences between implementation possibilities. The aim of testing was to find flaws in the shop process and analyze the experience.



Figure 34 Prototypes on how to present immaterial gift ideas to the customers of the immaterial shop



Figure 35 From the "candy" gift shop you can pick up the immaterial gift ideas as you would pick candies at the candy shelf



Figure 36 From this "Timeshop" you could buy immaterial gift ideas that save time, or give you quality time

3.1.3.2.3 Third development patch

In the third workshop, the participants *tested* the six *conceptual prototypes* developed by the design team. The AOBC space was divided in three spots and two prototypes were tested in each spot. Figure 37 shows the timeline of testing in one spot. After testing each prototype test, participants analyzed the experience by using the prototype-analyzing sheet (see Appendix 11) developed for this purpose. After testing all the alternatives, a common discussion was held.

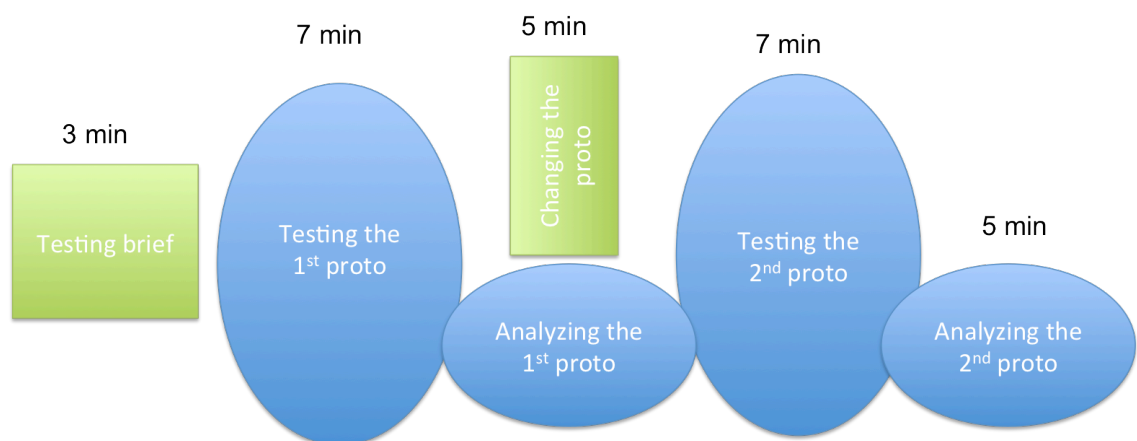


Figure 37 Process for testing two prototypes in one location

After the conceptual testing, an intensive working period started. Analysis of the service experience and the implementation possibilities and suitability to partner organizations service portfolio was conducted based on the discussions and the prototype-analyzing sheets filled in prototyping sessions. Based on this, two of the concepts, “a movable tree shop” and “an electronic board shop,” seemed most promising. More holistic prototypes of these service concepts were then created and tested in AOBC space. The aim was to create more high-resolution prototypes that could be used in experience tests at the premises of the partner company. Figure 38 illustrates the differences between the rough prototype and the more high-resolution prototype.



Figure 38 Low versus high resolution prototype of Idea tree

3.1.3.2.4 Fourth development patch

The fourth workshop was held in the premises of the partner company. Partner representatives were invited to *test the service experience* of two concepts in the on-site location (see Figures 39, 40 and 41). The workshop concentrated on testing and fine-tuning the concepts to better fit the partner organizations activities. The testers considered the “movable tree shop” most promising. After this prototyping session, “the movable three shop” concept was left to the on-site premises so that the clients of this partner organization could test the new service. The partner organization was responsible of the guiding the prototype testing. Based on the feedback gathered, the MIND researchers then summed up the final concepts for the immaterial gift shop.



Figure 39 A test customer writing their gift ideas on a leaf



Figure 40 A partner organization representative testing the "Idea tree" concept



Figure 41 Client organization representatives testing the electronic board

3.1.3.2.5 Final presentation and experiences on the process

The last workshop with the partner organizations was the presentation of the *Final concepts and evaluation-workshop*. During the session, business models were also drafted and strategies for implementation of the final concepts were also discussed.

The experiences of this experimentation process were similar to those of the two other cases described in previously. Time management was once again a problem (C_VS, C_MV, C_K-LH). Representatives had difficulties participating in all of the sessions and they felt bad about it (C_MV, C_K-LH, C_TK). Each of the interviewed partner representative wished that the dates for each session could have been decided in the beginning of the project (C_MV, C_K-LH, C_TK).

All in all, the project was rather linear, and the project deadline was set before hand. A tight timeframe forced the design team to go forward with each workshop rather quickly. This in turn forced them to make decisions between different implementation possibilities. Once again the design team felt that they should have prototyped more options in the conceptual phase and continued the process longer to really outline the details of the implementation. Many details were still left open and only the general idea how the implementation should be done was created.

3.1.3.3 Experiences on the prototyping techniques

During this case, the design team created service prototyping exercises that gave structure and guidance regarding utilization of some of the prototyping techniques. These exercises were utilized in the workshops where non-experienced prototypers were producing prototypes for the project.

The following exercises were developed (exercise descriptions available Appendix 10):

- 4Boxes exercise can be used to create a sketch on four different dimensions of the service proposition.
- Dream Theater structures role-playing of the dream service situation and its comparison for the current offerings.
- MINDwalk structures the imagination process of the whole customer process and experience.
- “Service mock-up building and body-storming in AOBC space” exercise to help in production of a prototype and testing it with a bigger group.

4Boxes and Dream Theater fit well with experimenting and testing the value opportunity ideas quickly and roughly. MINDwalk was good for putting the service concept in practice and creating different user scenarios. Observation of the participants shows that exercises can be used for teams that have not had previous experience on service prototyping, and they can produce an intended outcome in the set timeframe. The exercise structure does not ascertain that the prototype works as well as it could, but it significantly helps in getting on and getting something done. It also helped to point out flaws in the prototyping and point out better ways to prototype.

The exercise for service mock-up building and body-storming testing session were created based on the experience of the previous cases. The aim was to structure how to build a prototype quickly and how to guide the body-storming activity.

An experience test was undertaken by bringing the “tree idea” shop into the client’s premises. This prototype included several dimensions of the service: customer process, interaction process, information, physical artifact, and servicescape. The details were on medium-high fidelity level. The partner organization was responsible of the guiding the prototype testing. The project team essentially helped the partner organization to understand how to act with test customers and how to collect feedback effectively.

3.1.3.4 Prototyping practices utilized

Table 8 summarizes the prototyping practices utilized in this case.

Table 8 Prototyping practices utilized in Immaterial shop case

Practices mentioned in literature	The immaterial shop case implementation
Formulizing a clear hypothesis	The team did not set clear hypothesis before each prototype, but they kept in mind a question: "Does this service bring them extra value or burden of reducing consumption?"
Set deadlines and targets	The project ending time was set before the project was started. For each workshop the design team set themselves a target to bring the prototypes on next level.
Documenting	The team utilized new documentation format: prototype-analyzing sheet (see Appendix 11). The video and picture documentation was done systematically in each workshop and in prototyping sessions between them.
Parallel prototyping	Was utilized during the whole project. Every round there was several prototypes produced and analyzed at the same time.
Practices identified in this case	
Prepare yourself for the concept prototyping	The design team ideated the implementation ideas with sketches to the themes quickly in the beginning, and then proceeded in to collect materials and prepare the prototypes.
Prepare your testers	Prototypers gave a short brief to the test customers before they step in the testing area or before the imaginative MINDwalk started. This helped them to adapt the situation.

Once again there were issues having a tight schedule and pre-set end date. On one hand, it forced the development team to proceed and produce something concrete. On the other hand, the development team saw some disadvantages. The pre-set ending date forced project developers to make the safe choices, to select those ideas that they could most reasonably develop, rather than the wild ideas that would have required testing to bring more innovative solutions.

In this case, parallel prototyping was utilized during the whole project. By using parallel prototyping, the design team managed to generate different kind of prototypes in shorter time. It shortened the time frame for testing conceptual prototypes significantly, compared to the situation where each conceptual prototype would have been done individually. It also helped to provide variety because the team tried to make the prototypes as different as possible to generate knowledge on different ideas. During the testing sessions the design team noticed, that testing different concepts one after another gave the testers the opportunity to compare the customer experiences and the solutions. In these testing sessions,

people were more critical of the solutions compared to the previous projects. Because it was easier to compare the solutions, it was also easier to pick up the best implementation ideas and concentrate on building the holistic experience around them in the next prototyping round.

The team utilized a new documentation format: prototype-analyzing sheet (see Appendix 11). Besides documentation, it helped the testing situation, giving the testers a concrete tool to analyze the prototypes before discussing the subject. The prototype-analyzing sheet is not something to use in any prototyping, but it can work as an example form that can be edited for each purpose. The video and picture documentation was done systematically in each workshop and in prototyping sessions.

3.1.3.5 The end result of the experimentation process

All together, more than 300 implementation ideas were developed for the immaterial shop during the project. Seventeen concept prototypes were tested, and in the end final concept for immaterial gift shop, presented in Figure 42, was presented with two variations: a more communicational service concept and a more commercial service concept.

The basic idea of the immaterial gift shop is to offer gift ideas in an inspiring and attracting format. The gift is packaged into a delicious format and the gift giver is supported in his process of giving the gift by providing a tool called “Reminder”. It challenges the industry conventions of the shop by selling ideas for immaterial gifts; additionally it solves some problems relating to the immaterial gift giving. People tend to forget and find the actual production of the gift challenging and demanding. The video attached as Appendix 8 shows how the final concept works and what should be taken into account in finalizing it.

Two of representatives of the partner organizations considered that there could have been more prototypes to really map out the details of the implementation and lower the risks of the implementation project (C_MV, C_TK). For all the participants this case was a first time when they were involved in experimentation-driven innovation process (C_MV, C_TK, C_K-LH). They considered that the case showed that there could be a structured and systematic way of ideating and verifying the ideas by experimentation. Generally, they considered experimentation a useful tool. For instance, interviewees mentioned that it was easier to understand, comment on, and analyze the service concept when there was a prototype to experience. They also revealed, however, that they couldn't really start doing it themselves. (C_MV, C_TK, C_K-LH).



Figure 42 The immaterial shop concept

3.2 Cross-case analysis

This chapter describes the cross-case analysis regarding the way in which the experimentation-driven innovation model was put in practice in the innovation cases. The first subchapter presents the service prototyping concept created during the cases. The second subchapter discusses the commonalities and differences of the cases.

3.2.1 Service prototyping space concept

One of the aims of this study was to explore how a service prototyping space could help prototyping and when it should be used. The hypothesis was that services, especially the ones depending on a physical location for their provision, would benefit from a safe space for experimentation and development. Having a specific experimentation space could be valuable especially for a service innovation process, where the goal of the design team is to design and orchestrate a remarkably different servicescape.

The project got a 65-square meter space, visible in Figure 43, in Venture garage, located near to Aalto Design Factory. The space was titled as Act Out of the Box Center, or AOBC Space. The development of the space was managed iteratively along the two innovation cases, the nightclub and the immaterial shop case. The development team utilized a design-based research approach (Holmström, Ketokivi & Hameri 2009) for developing the space. In first instance, the hypothesis

was defined, after that first solution was created and tested by utilizing the space for the prototyping needs of the case under development. The learning points coming from the test were then used to enhance the solution. All together, three bigger development rounds were made during the nine months. The expression “learning by doing” describes well the hectic and iterative development process. The story of how the concept was created can be read from Appendix 9.

The AOBC space concept developed in this study supports rough and quick service prototyping. It is meant for an early phase of the innovation process, where explorative and rough evaluations of the ideas can describe the general purpose of the prototyping. AOBC space concept provides a playground for service developers and a space to organize service prototyping sessions. The project team utilized an improvisation theater stage as a metaphor for the design.

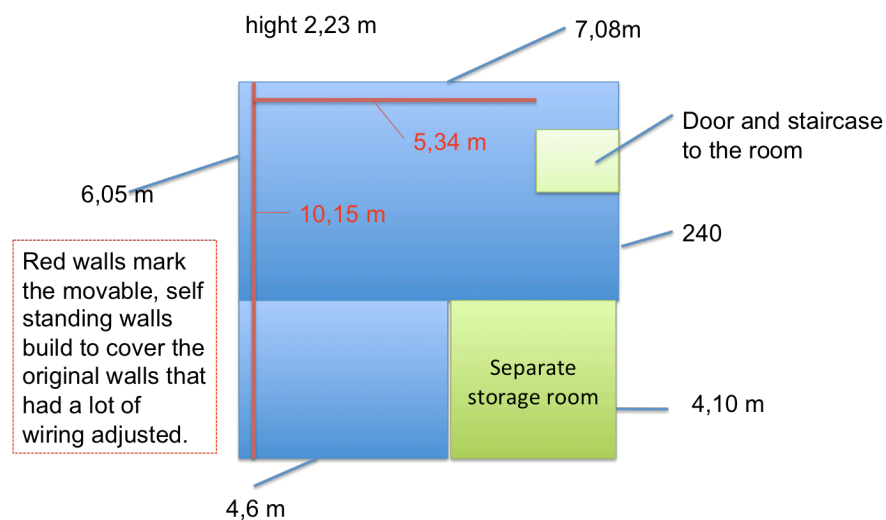


Figure 43 Measurements of the AOBC space

3.2.1.1 Core functions

The AOBC space concept consists of four functions (see Figure 44):

- Service playground area for the service prototyping
- Materials, furniture, tools and technology to be used in service prototypes and documentation
- Area for brainstorming, meeting and mock-up building
- Guidance and practices for service prototyping teams

The service playground is the area where service prototyping happens. Many rough service prototyping techniques can be used in the space, basically all the others presented in chapter 2.5.4.4 except experience testing. Based on the results of the nightclub case and immaterial shop case, it can be deemed relatively hard to build a plausible experience test in the discrete prototyping space from the real context. In principle, the effort needed to ensure the look-like and fine-tuned servicescape in the service prototyping space to give valid results for experience testing was excessive and almost prohibitively costly (DT_KH.1).

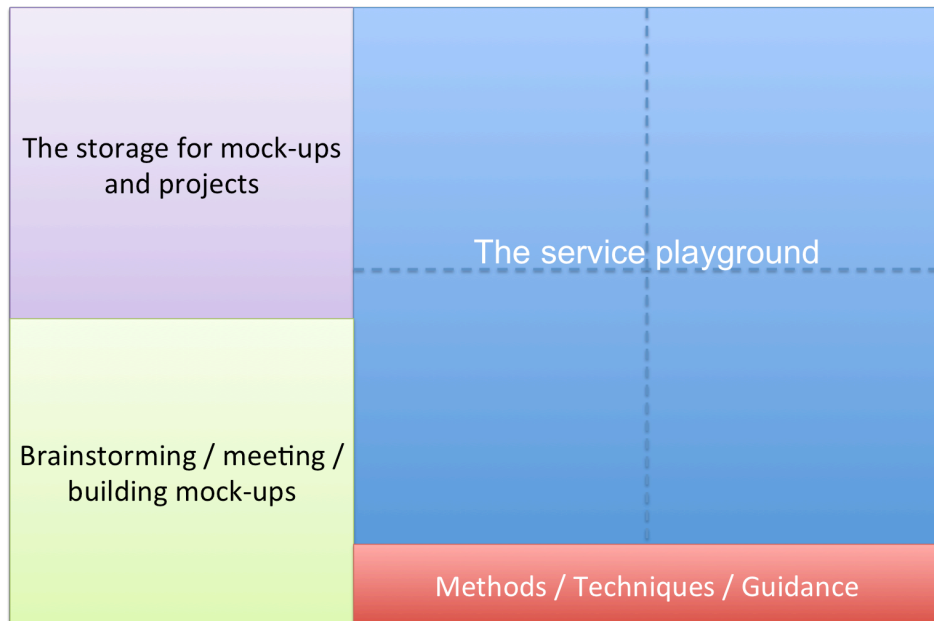


Figure 44 Core functions of the service prototyping space

As learned in literature review and through the experiences of immaterial shop case, parallel prototyping activities can support explorative prototyping by bringing more variety to the solutions. To encourage to parallel prototyping, the playground is divided in four areas (see Figure 44). When organizing prototyping sessions for multiple innovation teams at the same time, it is necessary to maintain the possibility to divide the playground space.

To enable the building of the service prototype, the prototyping space needs to provide some resources and furniture. It can be plain blocks or cubes that have been utilized in AOBC Space and in SINCO Lab, and some neutral furniture, like shelves, chairs, and table. Movable partition walls (see Figure 46) were also found useful. Additionally, painted or wallpapered wall surfaces offered an easy way of changing the basic look and feel of the servicescape (see Figure 46). Figures 45 and 46 give examples on how the tools were used to create service mock-ups. Here is a simple list of utilities to start with:

- 5-6 cube blocks, plain furniture, like tables, chairs, shelves
- curtain wire and high curtains from roof to floor or few movable wall blocks
- movable spot lights, with budget for instance from IKEA
- some color-changing remote controllable light solution
- chalkboards and mini-whiteboards for communication and information prototyping
- materials for mock-up building like paper cardboard, magazines, fabrics, tapes, glue and other basic tools.
- additional recommendations or comments about the technological solutions are provided later.



Figure 45 Example of the nightclub servicescape done with simple blocs, chairs and fabrics



Figure 46 Simple blocks with wheels used as partitioning walls

For these mock-up materials and furniture pieces, there should be a dedicated space, a storage room, besides the service playground. There should be also a space dedicated to store on-going projects. A method of keeping track of the utilities and what needs to be bought should be provided. A simple strategy is to place a shopping list on the wall. During the cases, it was noted that it was also good to have dedicated person to take care of procurement of needed equipment.

During the third development ground, it was noted that a dedicated space for brainstorming and for small meetings was needed besides the playground area. Basically, a bigger table and more chairs were needed, along with a large whiteboard, electronic or traditional. With a manual whiteboard, a movable projector would also be needed. During the innovation process, the teams went back and forth between data gathering, ideation, and prototyping so it is deemed important to have a room for these activities.

The last part of the concept is concentrated on the methods, techniques, and guidance for space users. This database should be updated and developed continuously, measuring also the learning of the organization. It is necessary to collect good practices and rules for the space, such as rules about reservations, storing the on-going projects, and cleaning.

To educate users about the space, it is good to have some methods and techniques available. These can deal with how to do service prototyping or how to facilitate prototyping in the space or how to organize testing sessions. This lowers the threshold of starting to utilize the space. During the cases, four exercises to facilitate prototyping were developed: 4-Boxes exercise for visualization and sketching, Mindwalk as an example of cognitive walkthrough, Dreamteather for role-playing and improvisation theater, and Mock-up building and body-storming to build a service setup and test it. Short descriptions of the exercises are provided in Appendix 10.

3.2.1.2 Requirements for the location and space layout

First of all, the location has to have easy access. Ideally, it would be near to an everyday workplace, even just next door to the project team members' offices. Based on the researcher's experience in two of the cases, the threshold of going to the space to test small ideas is raised significantly because of the distance of the AOBC Space from the office. The distance was about 100 meters.

Further more, the service prototyping space should be set up to so that guests and external testers can easily be brought there. This time, AOBC Space's location in the cellar did not allow this in all instances. The location and limited access affected the experience of the guests. There were people commenting about the access, the smell, and the impossibility to see outdoors, as well as the height of the ceiling (DT_KH.1, C_TV).

The atmosphere of the space should be neutral and refreshing so the space itself does not create negative feelings to prototypers nor the testers or other visitors of the space. Once again, the cellar used for this research was not an optimal location. It is known that the servicescape gives several different kind of stimuli, which all have an effect on the users of the space and their experiences

(Bitner, 1992). Therefore it is important that the starting point for service prototyping should be at least neutral.

The space concept is scalable, and the amount of space needed depends on the intended use. As a reference, large meeting room space is needed. The larger the space available as a playground, the more prototypes can be developed there in parallel. In Figure 44, the playground is divided into four areas, but this is not necessary, only a recommendation. Two of interviewed people even thought that it should be bigger than the space in this research, which was 65 square meters.

In the nightclub case, AOBC Space was a slightly small space to give a similar special sense as one normally has at a nightclub. The prototypers had to scale the nightclub down, and testers had to imagine how different functions would spread a round when there would be more space. In the case of the immaterial shop, however, the goal was to develop something light and easily movable, therefore there was enough space to prototype several concepts in parallel.

The playground area should also be shaped more or less as a square, so that it is easy to enter to the area, follow and videotape the prototyping.

3.2.1.3 Requirements for technology

Certain technologies should be included in the space. Internet access is a necessity given that services are getting more and more connected to the networks. Video recording capacity is also essential in service prototyping. The video recordings can be used for reviewing and analyzing the prototyping session and to facilitate communication about the prototypes. The recorded prototypes of ideas and concept can be presented to those who weren't able to participate in the prototyping session in the space. In thesis cases the video documentation was done by hand, which reserved one of the designers to shoot the video. Automatic and installed video cameras would handier.

Audio and lighting of the space has to be controllable as well. If the original lighting of the space is neutral and budgets are limited, the minimal requirement may be some extra movable spotlights for use with the prototypes. More enhanced system were, however, noted to be beneficial if a space is meant for multi-industry service prototyping. Then it is necessary provide opportunity to change the lighting so that it fits to different services, for instance, for a nightclub, or a home, or a hospital. One recommendation is to have remotely controllable lighting solutions that enable to change the overall lighting conditions.

One of the technologies explored was projection of the servicescape on the walls of the space. In these projects, this was done with front-side projector, which did not work well. One suggestion is to utilize back-provision projection displays, as they use in SINCO space. Projection increases the look and feel of the environment and helps to adapt to the situation. However, it is hard to re-create a realistic environment with this manner. It is not easy to fool human vision and people will notice that it is just a picture or video playing on the wall. Based on the experience of doing action research cases and observing external users, in the early phase of innovation process projection of servicescape is not necessary. The aim is to prototype as minimum viable service proposition as possible to answer to

the hypothesis. The less phases or activities there are in the process in the easier it is.

Based on the getting to know to the existing solutions for service prototyping spaces, a set of small movable screens, tablets, hand-projection tools can be recommended. These can be used in the interaction activities in the prototypes.

3.2.2 Commonalities and differences of the cases

The analysis on the experimentation process, prototyping techniques, prototyping practices and prototyping environment is pulled together in the following subchapters.

3.2.2.1 Analysis on the experimentation process

Cross-case analysis shows that in all of the cases, the design team iterated the four core activities of the design process: exploring the situation, ideating the value opportunities, experimenting, and analyzing the experiments. The focus was in the experimentation, which was noticed from the attitude of the design team. The teams aimed to prototype as much as possible to gain most benefits from learning by doing. The innovation team utilized experimentation to ideate (case 1, 2, 3), to inspire (case 3), to validate (case 1, 2, 3) and to communicate (case 2, 3) to stakeholders.

During the cases the knowledge generated in each activity was mapped down. Figure 47 visualized the analysis on what kind of knowledge each activity produces during the innovation process. The first two activities produce information and ideas that are based on assumptions. In the visualization, it is easy to notice how much knowledge the experimentation and its analysis produces. Experimentation and the analysis verify the ideas, reveal flaws in the assumptions, reveal hidden conventions and knowledge on the customer and its needs and generate execution ideas.

To give one example of the hidden convention from nightclub case: after prototyping the idea of the club for singles only, the team realized that many times people go to clubs with friends, and only some of them are singles and have the need to meet new people, others are just joining because they want to spend time with their friends. A nightclub for singles only would need that these people would be willing to go to a nightclub alone, which could be a huge challenge for the business.

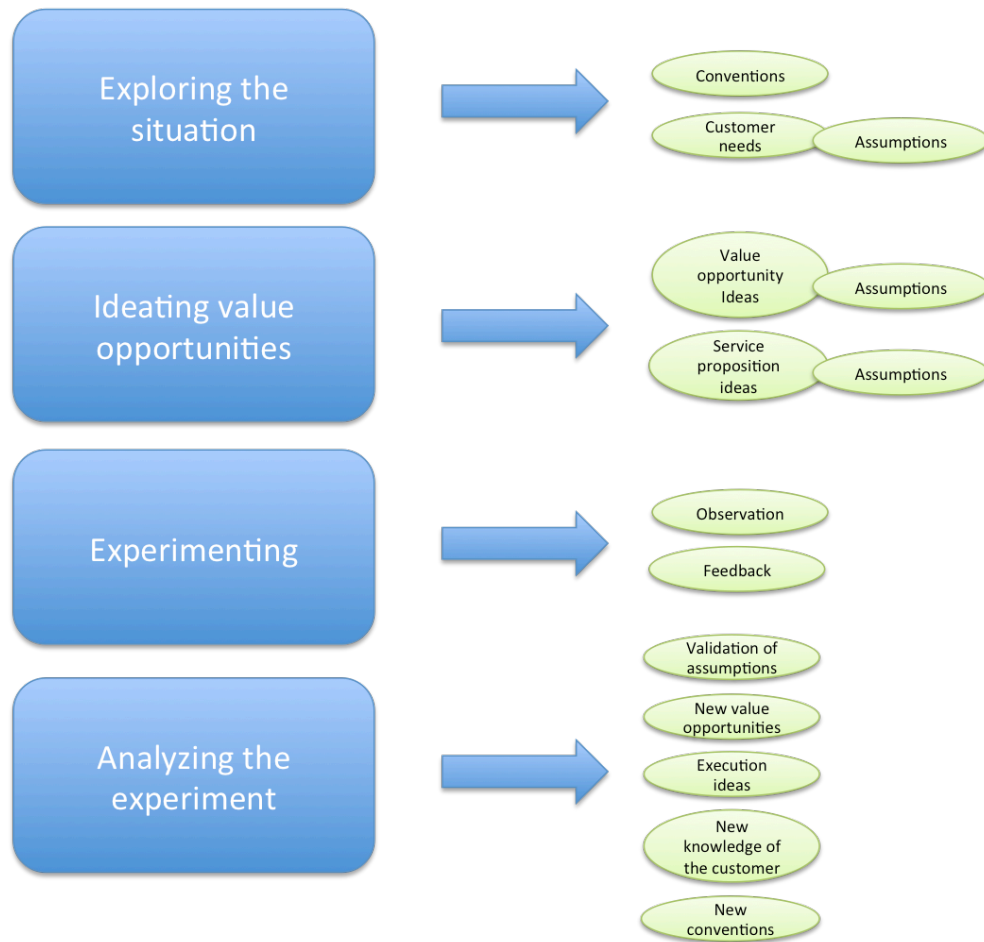


Figure 47 Knowledge generated during the innovation process

Table 9 summarizes the numerical data of the outcomes of design activities. The knowledge produced in the experimentation was not gathered separately. Instead, the number of different types of prototyping rounds, in blue, was calculated and the final concepts formed around validated ideas and the execution ideas.

Table 9 The numerical results of design activities

Case	Conventions identified	Ideas	Concepts	Rough idea prototypes	Concept prototypes	Experience tests	Final concepts
Nightclub	65	170	5	25	10	3	2
Park	No data	150	10	50	1	1	1
Immaterial shop	30	300	6	40	15	1	2

Considering the experimentation activity more closely, it is possible to differentiate three types of the prototyping activities: *rough and vague idea prototyping*, *concept prototyping*, and *service experience tests*. The numerical amount of different types of prototypes in each case is gathered in Table 9. Figures 49, 50, 51 and 52 show example prototypes of each prototyping category.

As learned in the literature review, the service prototyping consists of several perspectives, which affect on each other, see Figure 12 in 2.5.4.7. The commonalities of different perspectives in each prototyping activity were analyzed to determine how these prototyping activities are different from each other. Figure 48 visualizes the differences across the different prototyping perspectives. The differences were noted in: purpose of prototyping, when is it used during the process, the audience of the prototype, prototyping techniques, prototyping environment, and the representation itself. The fidelity and resolution level as well as the scope of the prototype were different in each type.

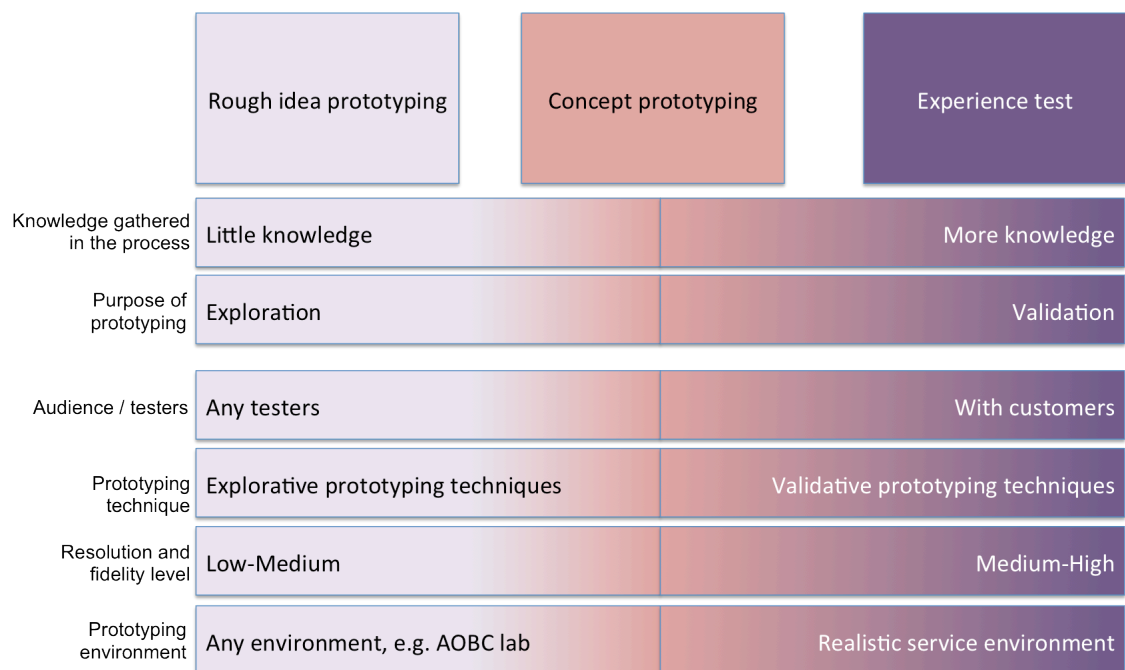


Figure 48 Differences of the prototyping types

First of all, the *purpose of the prototyping is different*: rough and vague idea prototyping is about exploration and ideation, concept prototyping is explorative but also validating, whereas service experience test is mostly used for validation. *Different type of prototyping is used in different phases of the innovation process*: rough and vague prototyping in the beginning and experience test later when there is more knowledge gathered.

In cases 1 and 3, different types of prototyping activity follow each other, meaning that the process started with idea prototyping. After finding some valuable ideas the team started building concepts and then iterated on this level until the concept was developed to the point where there was a best guess of the potential novel service concept. In experience prototyping the best guess of the service concept was brought to as real environment, tested with real customers, in real context, with real time passing. Before the team could conduct the experience

test, they had to know enough about the customer, the service process, the service environment, and other relevant parts of the service system to be able to create the relevant experience test.

The amount of knowledge increases when the process evolves. This explains in practice what Blomkvist (2011) means when he claims that the position in the process describes the amount of knowledge gathered in and this affects to the prototyping. To sum up, the scope of the prototype seemed to evolve from single dimensions to more holistic and multidimensional service proposition prototypes when the design process evolved.

The previous perspectives of prototyping affect on the other perspectives as seen in the linkage Figure 12. The prototyping techniques and the fidelity and resolution levels are discussed more detail in the next chapter. The analysis on the prototyping environments is discussed in the last subchapter of the cross case analysis.



Figure 49 Rough idea prototyping of the movie on the terrace idea



Figure 50 Concept prototyping of the "Time shop" concept in AOB space



Figure 51 The first experience test of the MINDclub concept



Figure 52 Experience test of "Time shop" concept located in the premises of the partner organization

The flow between different prototyping types was not straightforward. Prototypers revealed that they found it hard to know when to proceed to the next level of prototyping; from idea prototyping to conceptual prototypes and from conceptual prototypes to experience testing (DT_KH.1 & DT_JT.1). After starting to work with one opportunity idea is hard to know how much different kind of implementation ideas should be explored before choosing if there is potential with a certain idea. The teams felt that they made the decisions by intuition and under time pressure. In these cases the teams did not gather systematically the assumptions related to the idea, which according to the recent literature could have helped in choosing what to experiment. Neither did they have any practical tools, like Practical Framework for Prototyping in their use (Passera, Kärkkäinen & Maila 2012) for understanding what affect to the service prototyping, which could have helped in making the decisions relating to the prototype fidelity and resolution level.

The second challenge relating to the process was the time management. Prototypers pointed out that the time restrictions of the case forced them to make decisions and proceed towards experience tests, which was good in terms of coming up with some solutions. On the other hand, they wondered whether it enables them to explore enough different options, and whether the solutions was the best they could have gotten (DT_KH.1, DT_KH.2). Generally after the project all the prototypers and some case clients felt that they should have done more experiments (DT_KH.1, DT_JT.1, DT_KH.2, DT_JT.2, C_VS).

All in all, the core idea of experimentation-driven innovation model (e.g., Tuulenmäki and Välikangas 2011) got support from this study: instant experimentation can create the business system along the process. Especially the results of the park case illustrate this phenomenon. Basically the final result, the concept suggested to be implemented, was born via experimentation analysis. The final concept was not any of the original value opportunity ideas. It was partly a combination of different ideas that were tested and result of the observations done during the experimentation. In other cases the prototyping forced the design team to turn their value opportunity ideas into business concepts that were experimented to reveal the executable combination of the implementation ideas, which then was presented as a final concept.

3.2.2.2 Analysis on the service prototyping techniques

The design team tested different service prototyping techniques in the AOB Space and in public service environments to map out how different techniques support experimentation-driven innovation process and how should the techniques be used. All the techniques mentioned in the literature review (chapter 2.5.4.4) were tried out and analyzed. In Table 10, the results of the analysis are presented. On the left, there is short description on how the technique was put in practice and how the service prototype was created. The middle portion details, which dimensions of the service proposition (see chapter 2.5.4.2) could be prototyped with different methods. The dimensions are marked with one of the following:

- Essential: When the technique is concentrating on this dimension, on other words, the technique is most suitable to be used to prototype this dimension.
- Can be included: When the dimension can be included in the prototype, but it is not necessary. Choice can be made depending on the hypothesis that is tested.
- Not possible: When the prototyping technique isn't suitable for testing the dimension.

The general fidelity and resolution levels of the prototypes were also analyzed with reference to certain techniques and the scale: low, medium and high. This is visible on the right.

Table 10 Analysis of the service prototyping techniques

	Method of creating the prototype	Purpose of prototyping	Physical artifacts	Information	Servicescape	Interaction	Process and time	Service experience	Fidelity & resolution level
Cognitive walk-through	Imagining, talking, taking notes or video	Exploration	Can be included	Can be included	Can be included	Essential	Essential	Can be included	Low
Sketching	Drawing	Exploration	Can be included	Can be included	Can be included	Can be included as snapshots	Not possible*	Not possible	Low
Storyboarding	Drawing and writing	Exploration	Can be included	Can be included	Can be included	Essential	Essential	Not possible	Low
Scenario building	Writing or talking or making a video	Exploration	Can be included	Can be included	Can be included	Essential	Essential	Can be included	Low
Role playing	People acting	Exploration	Can be included	Can be included	Can be included	Essential	Can be included	Can be included**	Low-Medium
Body-storming	People acting with mock-ups	Exploration	Essential	Can be included	Can be included	Essential	Can be included	Can be included**	Low-Medium
Service walk-through	People role playing the service process	Exploration Rough validation	Can be included	Essential	Can be included	Essential	Essential	Can be included**	Low-Medium
Modeling and testing the servicescape	Building a setup of the servicescape either with physical environment or virtual environment	Exploration, Rough validation	Essential	Can be included	Essential	Essential if tested with body-storming or role-playing	Essential when tested with body-storming or role-playing	Essential when tested with body-storming or role-playing	Medium-High
Experience test	Building the service setup in real environment and testing with as real conditions as possible	Validation	Essential	Essential	Essential	Essential	Essential	Essential	Medium-High

* If you want to prototype process and time by drawing, you should consider storyboarding

** The method enables testing the service experience in general level, but the verisimilarity of the prototype environment, situation, and people affect on how truthful results can be gained.

Cognitive walk-through, sketching, storyboarding, role-playing and body-storming were used in the beginning of the design process when the team did not have a lot of validated knowledge yet. These methods did not require a lot of preparations, equipment or tools, nor were the details of the service needed. During the cases, these techniques were used to generate implementation ideas, combine different ideas, and test them in general level. The resolution was kept low, because if it seemed inefficient to add a lot of details or fidelity, when the overall idea of the service is still open. The service designers said that they did not want to invest on building something on detail before they had any clue on if the idea works or not (DT_KH.1 & DT_KH.2). These methods were good when the team tested ideas relating to certain touchpoint or service situation, or whole service process. Other dimensions were included in the prototypes when necessary. Cognitive walk-through, role-playing and body-storming were found somewhat experiential methods, meaning that the tester and prototyper can feel and experience the service being developed. It can give general image of the service experience.

Service walk-through and modeling and testing the servicescape need more gathered knowledge to be used efficiently, and therefore were more useful later in the design process. As Baker (1987) defined, servicescape comprise tangible (such as building, decorations and fixture), intangible (such as temperature, color, scent and music) and social (amount and appearance of people) features. Servicescape facilitates the service provision, and is a tool to make customers act as intended (Bitner 1990). Before starting to prototype, the designer had to have an idea about what kind of behavior was intended; how the service process was going to be. It was also important to have an idea on what kind of service experience is looked for, because the service environment has important influence on the experience and customer satisfaction (Bitner 1990).

Servicescape modeling and testing should be seen as ideation and pre-validation tool for the service concept. In real situation, people are really sensitive on the issues in the servicescape (Bitner 1990). At least based on the project team's attempts to model and simulate the service, there is always so many faults and rough details in unreal servicescape. For that reason, the results of service experience are not reliable, just illustrative. Analysis on the different prototyping environments is further discussed in last subchapter 3.2.2.4.

A service walk-through is used for modeling the whole service journey. It combines different prototyping methods, like role-playing, paper prototyping, product mock-ups, body-storming, and experience prototyping as a holistic prototype considering different touchpoints (Blomkvist, Åberg & Holmlid 2012). The essential aspects of servicescape can be considered and modeled during the service-walkthrough, but the fidelity and resolution is kept low. Many times the prototyping in AOBC space can be considered as service walk-throughs, because the servicescape itself haven't been the essential subject of study. It was noticed that, to some extent, service walk-throughs can validate ideas, help determine what works and what does not. Modeling the service scape also does not give reliable results on the service experience, just an illustrative picture.

For validating a concept and testing the service experience, a holistic experience test should be used in as real environment as possible, meaning real customers, servicescape with details, real situation and time aspects. During the cases, it was noticed that there is no common way of producing an experience test; neither can you provide any concrete tools for it. Both the service proposition to be prototyped and service environment is always unique. What helps in prototyping is that there is a clear consensus on the concept and good mock-up prototype done. Also careful planning with the team helps to produce as verisimilar experience than the real service would provide. It is important to consider both the service process and the servicescape in the design of the experience test, because both of them can affect on the customer experience and therefore the evaluation of the prototype.

3.2.2.3 Analysis on the service prototyping practices

The researcher monitored how the design teams utilized different practices mentioned in the literature and how did they affect on the progress. Follow-ups were also undertaken if there were some new ways to organize the working.

The most important practice utilized was *setting a deadline* for each prototype (utilized in case 1) or prototyping round (utilized in case 3). That was a concrete target that pushed the teams to work. Without a deadline the team can spend enormous time with building and fine-tuning the prototype although the overall process does not require yet high-fidelity prototypes. The overall project deadline on the other hand divided opinions. It forces the team to work efficiently towards the target and progress to the next prototyping levels. It might, however, affect the overall result because it might lead to a situation where the team makes “too easy” decisions, selects the ideas which are safe, which are easy to work with instead of trying to push the more challenging ideas as prototypes. The experimentation-driven innovation is most of all explorative, no one knows the right answers, therefore there should be time to do the exploration and fail in the experimentation. The schedule of the cases, around two months each, was too tight for having enough co-design sessions with different stakeholders. The intensive working method the design teams had lead to the situation where the design team produced the solutions and the stakeholders analyzed them.

Setting a clear hypothesis is also highly important practice. In these cases the teams didn't manage to set it clear enough, but some progress could be noticed. In the second and third case, the teams had the general goal of the process as a reference hypothesis, which helped them to analyze the results. Literature suggests concrete and clear hypothesis, what exactly that prototype is testing (Hassi & Tuulenmäki 2012; Passera, Kärkkäinen & Maila, 2012) and that did not happen in these cases. More concrete hypothesis could have helped in deciding whether it is the idea that fails or it is the way it is prototyped.

Documentation is a way to collect a knowledge bank for the design team. The teams tried different solutions and the last one created in the case 3, the prototype-analyzing sheet (see Appendix 11), seemed to work the best in an organized testing situation like a session in prototyping space. Besides documentation it helped the testing situation, giving the testers a concrete tool to analyze the prototypes before discussing on the subject. The prototype-analyzing

sheet is not something to be ready to use in any prototyping, but it can work as example form that can be edited to each purpose. In experience test or otherwise when prototyping in real environment there might not be a chance to use the prototype-analyzing sheet, a focused observation and notes afterwards is a best way to collect the data. It is possible to ask feedback, but you shouldn't rely only on that, because the feedback rate can remain pretty low (case 1).

Parallel prototyping was tested in the case 2 and 3. In AOBC space it helped to produce more prototypes in shorter time frame. The numerical results of case 3 presented in Table 9 show that there were more vague and rough idea prototypes and conceptual prototypes than in case 1. Testing session with parallel concept prototypes in case 3 also showed that parallel prototyping is easier to the tester. Having parallel prototypes helped them to compare the different solutions. Testers also described and analyzed the prototypes more. It also allowed the observation of differences in service experiences.

The practice of service prototyping and iteration showed several strategies that helped in the progress of the overall development process. Somewhat obviously, *making decisions and narrowing the scope* of ideation is an important practice to highlight. In experimentation-driven innovation, the role of experimentation is explorative, and this sets a certain mindset to the designers. It could be noticed that with this mindset the design teams didn't want to restrict the possibilities. The struggle in the first case, however, showed that it is impossible to jump around the subject all the time. At some point, there needs to be more focus to allow for the creation of a comparable solution and find best implementation ideas.

All the cases showed that it is important to *prepare the concept before doing a conceptual prototype*. Ideating, rough level sketching, and roleplaying seemed to help to prepare the designers for concept prototyping.

One of the practices relating to the prototyping action itself was the preparation of testers. Especially if the prototyping happens in AOBC Space, it was important to *prepare the testers*, to set them on the context where they would be normally when utilizing the service that was prototyped.

3.2.2.4 Analyzing benefits and challenges of prototyping environments

This study tried to shed light on what benefits the service prototyping space brings to the service development process, and how and when such space should be used. During the service innovation cases, the researcher gathered the benefits and challenges the participants noticed relating to the prototyping in the AOBC Space and experience tests placed in real service environment.

3.2.2.4.1 Benefits of prototyping in AOBC Space

Interviews and observation of the space users showed that AOBC Space *encourages to start acting* (DT_KH.1, DT_JT.1, C_MV). According to case 3 interviewee, the space and the exercises help to be brave; "it in away forces you to start acting out of the box" (C_MV). Interviewees of the case 1 (DT_KH.1, CT_JT.1) and 3 (C_VS, C_TK) pointed out that coming and being in the space forces you to

bring your ideas concrete otherwise there aren't any prototypes. Being in the space dedicated to prototyping helps to proceed from ideating of value opportunities to practical implementation ideas. In the beginning of the design process, in AOBC Space the *prototypes can be kept very rough*. This means that service developers can *try different options and look for best possible solution* to the customer need.

If experiences of prototyping in AOBC Space and real service environment are compared, there are indications of several benefits that AOBC Space offers. Case 3 showed that one of the benefits is the good *possibility to prototype several ideas in parallel without confusing the testers*. In a real environment, this could be hard, probably demanding a lot of human resources, or confusing the client if the prototypes are placed in the same prototyping sites. On the other hand, in the park case some of the ideas were tested in parallel directly in the park, but the prototypes illustrated different ideas not alternatives with the same intended outcome.

In the AOBC Space, *the prototypers can control the test persons and give briefs to them*. In public space, the real service environment is a lot harder to control and each tester has to be considered as a normal customer, trying to fulfill a need. Test people have to be considered more or less paying customers if it is not stated that this is a special testing session. An example of the test person briefing can be provided from the nightclub case: "Imagine you are having a bar evening with your friends and feeling like meeting a new girl". This shows that in the AOBC Space, the situation can be also imagined, or future oriented, because the testing situation is always detached from the reality, the context of service experience has to be defined by the prototypers.

In the AOBC Space prototyping session, the *discussions and analysis of the prototypes can be managed more easily*. In the cases, open discussion (case1) and prototype-analyzing sheets (case 3) were used, as demonstrated in Appendix 11. It was noticed that in experience test situation, making analysis is harder. Giving feedback is not a natural part of the service process. For the "normal paying customer," this can seem like an extra burden. In the park, for instance, the prototypes were offered for a mass of people, and the design team could mainly observe how people react. In the nightclub case, the design team asked the testers who participated to the experience tests to fill in online feedback forms, but the participation rate was low, only few people filled in the form.

In the AOBC Space, *it is possible to test service process in compressed format instead of trying the service, as it would be in real life*. This was especially useful in the nightclub case, because normally the utilization of the nightclub service lasts several hours. Several speeded-up conceptual prototyping sessions showed that it is possible to outline the process and test the general idea in AOBC space and then, of course, verify the service experience utilizing more realistic timeframe. Compressed format is efficient in early exploration, but affects on the validity of the prototyping results.

One of the significant benefits of the AOBC Space is that *it is possible to build service environments that do not exist yet*, like a home party club as developed in the case 1.

Case 3 showed that *structured prototyping exercises could facilitate experimentation also for those who do not have any experience in prototyping.*

3.2.2.4.2 Challenges of prototyping in AOBC space

In a service prototyping space, the *service environment is always artificial* and that affects to the behavior of prototypers and testers and it has to be taken onto account when analyzing the results. One of the questions the design teams struggled with was the question of fidelity and resolution: “Until which fidelity and resolution level the prototypes should be produced in AOBC space?”

Most of the time the team started with very rough version and then continued to develop the prototype’s fidelity higher if the idea had any promises or it was not understandable for the testers. Pretty soon during the nightclub case it was noticed that there is no point of bringing the prototypes in the level where people would really be able to spend their party night in the AOBC Space. There was no point to gather the booze, have the real money, and spending hours in the artificial prototyping space illustrating a nightclub.

During the prototyping sessions with different people, the team noticed that *inexperienced testers tend to keep the negative feedback on themselves*, and they do not easily start challenging the prototype during the testing. A reason for this could be that people are not familiar with experimentation culture, and the openness and sincerity required from the testers. One of the points of prototyping is to challenge the ideas, for instance you could take a role of tricky customer. The AOBC Space should encourage performing different kind of customer roles and moods.

During the nightclub case and immaterial shop case *it was hard to get real users to the space for test events*. The team had to use plenty of time to agree with people. The same challenge existed with other stakeholders of the service. It would be valuable to test many times with all stakeholders in present, but for instance during the case 3 it was impossible to get the case representatives present to the prototyping sessions even every week.

The last negative downside of having the AOBC space is the *costs of having the space*. The investments, though, are probably not high.

3.2.2.4.3 Benefits of prototyping in the real service environment

One of the main benefits in prototyping in real service environment is the reality of the situation, context, and people. These affect to the validity of the prototyping. *Real service environment provides more holistic and truthful service experiences to be evaluated*. For instance, with nightclub case, the real service environment allowed to analyze the value created for the customer when the process was gone through with real timeframe compared to the compress versions of the prototype sessions in the AOBC Space.

Prototyping in real environment can also save resources when there are just minimum modifications needed to transform the current service location into the setup needed for the prototype. The whole park case is a great example of this kind of situation. The park was easily available and the ideas where add-ons to the premises and to the services already existing in the park. In the park case it was

also a necessity to prototype in a real service environment, because there was no possibility to create an artificial park in the AOBC space.

3.2.2.4.4 Challenges of prototyping in the real service environment

Generally, it was noticed that *testing with real customers takes more time to prepare*, especially when the focus is in the experience (Case 1, 2, 3). The experience prototypes represented the service holistically and the fidelity and resolution level was significantly higher than prototypes in the AOBC space with non-real clients. It took several days to prepare the experience prototypes of the concepts in case 1 and 3 compared to couple of hours that the conceptual prototypes took in AOBC space.

When prototyping in the real service environment, *the risks are higher*. A failure means failure in front of real customers. Pointing out that there is a test on going is useful sometimes, but not always so easy. In the park, for instance, probably most of the people did not know that there was a test going-on when the design team offered new services to them. Sometimes it is important to get totally honest opinions, meaning that the testers do not know that there is a test on going.

The design teams considered that they could not approach the customers with mock-ups that were too rough. As the literature suggests, there is a minimum level of verisimilarity to be sought, even though the props do not need to be totally polished (Passera, Kärkkäinen & Maila 2012). The real challenge is to find the sweet spot where the prototype is refined enough to look credible, but unrefined enough to allow for feedback, questions, and modifications (ipid). *Higher fidelity also makes it harder for customers to know that it is just an experiment*. The balance between avoiding risks and keeping the design regarded as incomplete is something that is hard to reach.

4 Conclusions and recommendations

In the continuously changing business environment, companies need to adapt, react, and develop more innovative solutions to satisfy customer needs. In this thesis, the aim was to understand how the companies could design novel service propositions and experiment them so that they can validate what kind of value is created for the customers. The research problem was stated as:

“How to develop service innovations through experimentation?”

The research approach was pragmatic. The research describes the practical process of prototyping service ideas and practices and tools to support prototyping in early phases of service innovation process.

This chapter establishes the conclusions and recommendations of this study. The first subchapter explains how service as a design object and experimentation process is linked together. The second subchapter describes the experimentation-driven innovation process framed based on literature and the empirical research. The following subchapters draw conclusions regarding the prototyping techniques and practices. The last subchapter opens up how to select the prototyping environment. In the end, the generalizability and limitations of the study and further research agenda is presented.

4.1 The relationship between service as object of design and the experimentation process

To understand what is actually designed and how experimentation helps the design process, there was a link established between the service proposition as an object of design and the experimentation process and show what the designer actually can do.

The service-dominant logic introduced by Vargo and Lusch (2004) have set the base of the service science and changed the paradigm of value creation and the traditional role of customer and companies. It renews how companies should see their own abilities to affect to the customers value creation process. As stated in the first part of the literature review, a company can only suggest value in the form of a service proposition (Vargo & Lusch 2004a). It is the only part that companies can design and manage (Vargo & Lusch 2004a, Edvardsson & Olsson 1996). The service exists and customer value is created only when the customer is interacting with the service proposition. Each customer defines the value themselves (Vargo & Lusch 2004a). The value is always contextual and experimental (Vargo & Lusch 2008).

The service-dominant logic amplifies the role of experimentation in the design process. Experimentation is a tool for a designer to look the service from the customer point of view. Correctly done, it allows to check whether the new design can create the intended value or not, and what kind of experiences the service proposition can create.

In the Figure 53, a link is established between the object of service design (Edvardsson & Olsson 1996) to the general experimentation process (e.g. Davenport 2009; Ries 2011). This picture underlines how companies can and should utilize experimentation to validate the value created with their service proposition.

The first step, setting the hypothesis combines the value opportunity ideas and service proposition ideas that are exposed for experimentation. After that comes the ideation on how it could be experimented, this is the point where the designer is trying to create “the *optimal minimum setup*” (Passera, Kärkkäinen & Maila 2012) for testing the hypothesis. After ideation starts the building of a prototype. Prototype consists of several service proposition ideas on how to facilitate the customer service process. The ideas relate to three prerequisites: the concept, the process and the service system (Edvardsson & Olsson 1996).

Running the experiment is the point where the designer works with the whole business hypothesis, bringing the customers to try out the service prototype. The interaction between the customer and the service proposition prototype create the customer process and outcome. In the analysis, all the parts of the service object are reviewed. The aim is to compare the hypothesis and potentially validate it and verify some of the assumptions the ideas might include.

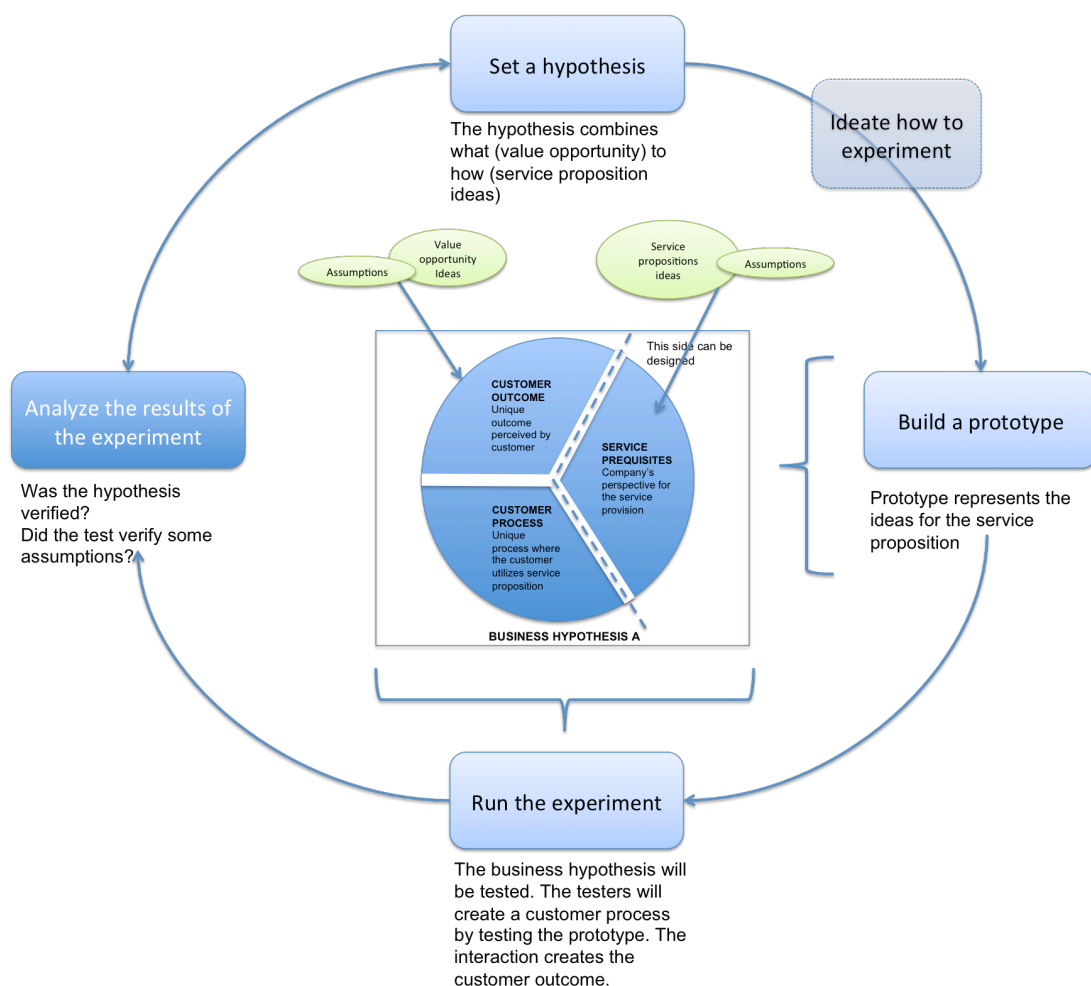


Figure 53 Connecting the experimentation process to the object of design

4.2 Activity based experimentation-driven innovation process

When the connection between the design object and experimentation is understood, looking at the whole innovation process is possible. As will be demonstrated, the model bases largely on existing studies of literature, combining existing models and seeing the process holistically. The empirical study strengthened and helped to formulate it so that it describes the practical perspective of the process.

The four-step design process (e.g., Stickdorn & Schneider 2011, pp. 126-135) (see Figure 5 in chapter 2.3.2) and experimentation-driven innovation model (Tuulenmäki & Välikangas 2011; Hassi & Tuulenmäki 2012) (see Figure 9 in chapter 2.4.2) set the base for the activity based experimentation-driven innovation process illustrated in the Figure 54. The experimentation is in very heart of this process. The difference between this model and the model from Hassi & Tuulenmäki (2012) is that this model describes the activities that produce the value opportunity, experimentation and implementation ideas that flow through the process. Activity based approach helps a practitioner in searching tools and methods to perform to produce the intended outcomes.

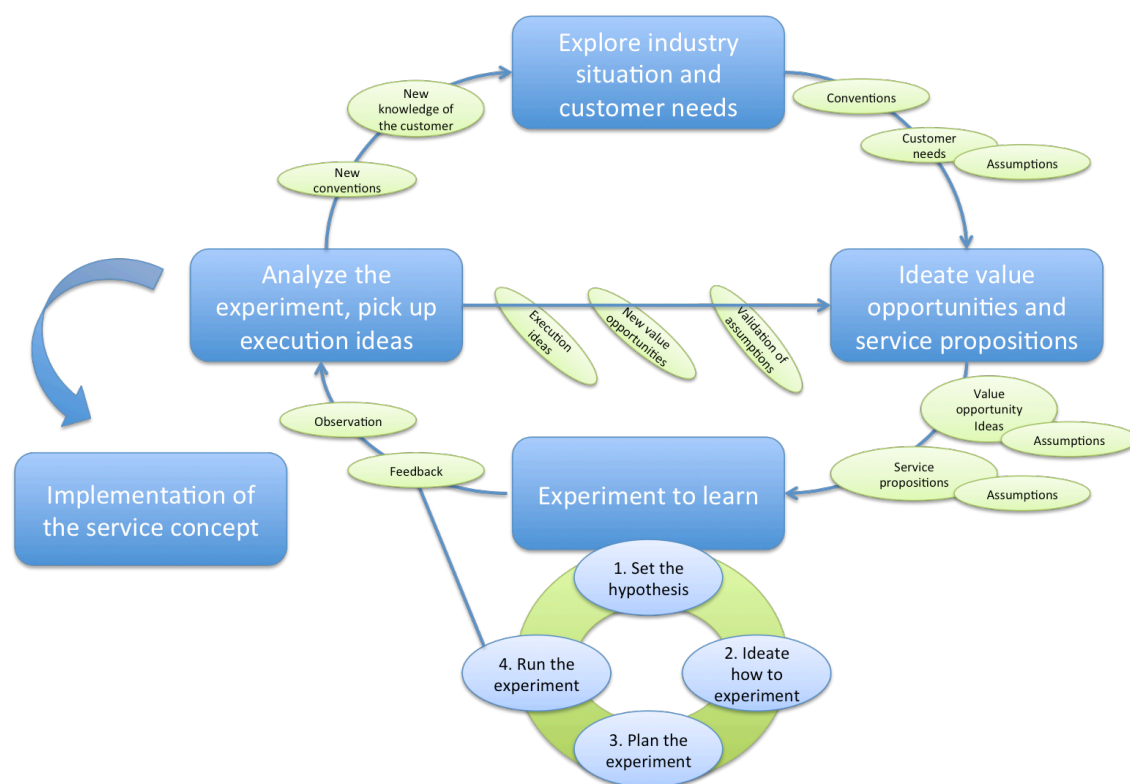


Figure 54 Activity based experimentation-driven innovation model

The first activity is *Explore the industry situation and customer needs*. When the aim is to challenge the conventions and create novel service propositions, questions like “What are the conventions that could be challenged?” or “Are the unmet customer needs?” can be asked. This activity refers to the exploration of situation and needs (Stickdorn & Schneider 2011, pp. 126-135) phase in the traditional design process.

The second activity is *Ideate value opportunities and service propositions*. The aim is to find ideas on how to challenge the current way of doing things, the knowledge gathered in the first phase. The customers needs are also an important inspiratory of the ideation. After getting a good idea, is time to validate the assumptions behind the idea with experimentation.

The third activity is *Experiment to learn*. Experimentation is the core of the model. As learned in the literature review typical experimentation process includes four steps: set the hypothesis, plan the experiment, run the experiment and analyze it (e.g. Davenport 2009; Ries 2011). Based on Hassi and Tuulenmäki (2012), three kinds of ideas are necessary: value opportunity ideas, experimentation ideas, and implementation ideas. According to their study, finding the experimentation ideas seems to be hard, and it is actually the soul of the entire process. To emphasize this, the creation of experimentation ideas was added after setting the hypothesis for the experimentation. The ability to generate quick and simple experiments depends very much of this. Empirical study demonstrates that in some cases, rather than ideating the experimentation idea, it is planning and preparing for the prototyping.

This phase is especially important when experimenting outside the service prototyping space. "Where to experiment?" "How to modify the real service location to resemble the new service proposition?" "How to get test persons?" "Who should we get?" These are important decisions to make before going in to action.

The fourth activity is *Analyze the experiment, pick up implementation ideas*. To illustrate the iterative nature of process already in the concept development phase implementation of service concept is transformed to the left of the iteration, and analysis of the experimentation is placed to the spot where implementation normally lies in design process. Exploring the opportunities and gathering the implementation specification for novel service concept might mean several rounds of whole process. When value proposition is validated and implementation ideas exist, it is time to proceed to the implementation of the concept, which is visible in the left side of the Figure 53. This study does not concentrate on that part, so the implementation is just considered as such a bunch of activities.

As experimentation literature (e.g. Thomke 2003, pp. 2-3; Ries 2011, pp. 75-78; Tuulenmäki & Välikangas 2011) stresses, the whole point of experimentation-driven innovation is to transform the insecurity and assumptions relating to the ideas and plans to knowledge-based experience. Not to plan into future, but learn from trial and error. For this reason the researcher visualized what type of knowledge is gathered during the activities.

After the first phase, exploration of the industry and customer needs, lists of conventions and different kind of customer needs are available. It is important to highlight that some the customer needs can just base on assumptions, not facts. The idea of experimentation-driven innovation is to validate the assumptions as early as possible, so that the knowledge is building up and risks are lower.

After ideation activity comes a bunch of value opportunity ideas or service proposition ideas. Both of these can include several assumptions that need to be

verified to figure out does the idea has really potential or not. Once again, experimentation is needed to validate these assumptions. During the experimentation cycle, these assumptions are transformed to business hypothesis that are tested in the prototyping.

During the empirical study, the design teams reported difficulties in knowing which ideas to take into exploration and when to proceed to the next step or should the team continue looking for new value opportunities. The problem they had relates to the fact that the teams did not analyze the assumptions relating to their ideas well enough. They therefore did not have tools to choose which ideas they need to verify.

Running the experiment produces feedback and observations that should be analyzed. Analysis can lead to the development of new conventions and better knowledge of the customer needs. These flow back to the activity number one, the exploration of the industry and customer needs. Analysis provides also information for the ideation phase: new value opportunities can be found out. The experimentation hopefully has validated some assumptions that can be deleted. Additionally, there can be good execution ideas that should be explored more holistically in the next iteration.

4.3 The concept of the best guess

The empirical study showed that this experimentation-driven innovation process is repeated iteratively, but all the rounds are not similar. There is a linear development of the ideas towards executable service concepts.

Three types of prototyping activities were identified, describing how the service design process proceeds. First comes the *rough and vague idea prototyping*, then there is the *concept prototyping*. Finally there is the best guess, validated with *experience test*. These prototyping types reflect the knowledge gathered in the process. If the idea changes completely or totally different kind of implementation concept is created there can be steps backwards, like happened in case 1 with the house party club. The process can repeat also in parallel, like happened in case 2 and 3. Developing several ideas further in parallel increases the efficiency of the process.

The best guess is a holistic view to the service prerequisites that could create the intended value. In an experience test done with real customers, in as real an environment as possible, the design team can test the service experience and customer outcome as presented in the previous chapter. This does not mean that the best guess should contain all the details of the service proposition. With experience testing, the minimum viable product rule also applies.

An experience test is easily time consuming, because the fidelity and resolution level is raised higher. It is worth doing it only for the best ideas that are already pre-validated with lighter service prototyping techniques.

Based on the experience of the empirical study, each experience test situation is always unique, and the key is to understand the design object and the industry well enough.

It is important to remember that the final concept produced in the experimentation-driven innovation process is still just a good guess, until it is implemented and the revenue flows are growing.

4.4 Service prototyping techniques

“What is a service prototyping technique?” was one of the first questions to answer when this study was launched. The existing literature, however, is filled with repositories of service design tools. The problem is that these repositories do not clearly point out which are prototyping tools, and how those should be used. The answer to the question had to be formed by analyzing the different techniques utilized in service design. Criteria for which techniques should be considered as service prototyping techniques were formed from Blomkvist’s (2011) definition of the prototype and the service design principles (Stickdorn 2010). Criteria were presented in chapter 2.5.4.4.

In short, the service prototyping technique enabled creation of an embodiment, a representation, or a manifestation of the service idea holistically. The prototyping action or testing action should enable to see the service from the customer perspective, and most importantly it should give a way to test the hypothesis and assumptions embedded in the created prototype. As a result of the analysis, the following techniques can be considered as service prototyping techniques:

- Cognitive walk-through
- Sketching, depends on the object that is sketched
- Storyboarding
- Scenario building
- Role-playing and improvisation theatre
- Body-storming
- Service walk-through
- Modeling and simulating servicescape
- Experience test

Besides having been ambiguities with the techniques, there is a lack of tools available for selecting a suitable prototyping technique for each situation. During the empirical study, the mentioned prototyping techniques were tested and analyzed. Suitability of each technique was evaluated on following perspectives: the general purpose of prototyping, different dimensions of the service to which the technique can be used and the possible fidelity and resolution level of representation the technique produces. The results of the thorough analysis are presented in the Table 10, which can be used as all-together tool for selecting a technique for different prototyping situations. The following discusses each perspective one by one.

It was noticed that some methods are more suitable to exploration and cannot really help in validating, like sketching or cognitive walk-through. Table 11 presents *simple heuristic for choosing a service prototyping technique based on the general purpose of the prototype*.

Table 11 Heuristics for choosing a service prototyping technique based on the general purpose of the prototype

Ideation	Rough validation	Validation
Cognitive walk-through Sketching Storyboarding Scenario building Role-playing Body-storming Service walk-through Modeling and simulating servicescape	Service walk-through Modeling and simulating the servicescape + Body-storming or role-playing	Experience test

The next question to consider is: What service dimensions should be in focus in the prototype? *Different prototyping methods are good for prototyping different dimensions* as can be seen from Table 12. In storyboarding, for instance, the service process and interaction are essential. The physical artifacts or information, on the other hand, can be included to the prototype when found useful. In experience test nearly every dimension is somewhat essential.

Table 12 Connecting service prototyping techniques and service dimensions

Service Prototyping technique	Physical artifacts	Information	Service-scape	Interaction	Process and time	Service experience
Cognitive walk-through	Can be included	Can be included	Can be included	Essential	Essential	Can be included
Sketching	Can be included	Can be included	Can be included	Can be included as snapshots	Not possible	Not possible*
Storyboarding	Can be included	Can be included	Can be included	Essential	Essential	Not possible*
Scenario building	Can be included	Can be included	Can be included	Essential	Essential	Can be included
Role playing and improvisation theater	Can be included	Can be included	Can be included	Essential	Can be included	Can be included
Body-storming	Essential	Can be included	Can be included	Essential	Can be included	Can be included**
Service walk-through	Can be included	Essential	Can be included	Essential	Essential	Can be included**
Modeling and simulating servicescape	Essential	Can be included	Essential	Essential if tested with body-storming or role-playing	Essential when tested with body-storming or role-playing	Essential when tested with body-storming or role-playing
Experience test	Essential	Essential	Essential	Essential	Essential	Essential

* If you want to prototype process and time by drawing, you should consider storyboarding

** The method enables testing the service experience in general level, but the verisimilarity of the prototype environment, situation, and people affect on how truthful results can be gained.

The third aspect to consider is the fidelity and resolution level of the representation. Different techniques are more likely to produce representations on certain fidelity level. Of course, it depends also how the techniques are utilized. In an experience test, for instance, the resolution level should be medium or high, whereas in body-storming it is wise to keep it rough. In Table 13, the service prototyping techniques and aimed resolution level are linked together.

Table 13 Heuristics for connecting the service prototyping techniques and the resolution level

Low resolution	Medium resolution	High resolution
Cognitive walk-through Sketching Storyboarding Scenario building Role-playing Body-storming	Service walk-through Modeling and simulating servicescape	Modeling and simulating servicescape Experience test

One result of the project is the service prototyping exercises created during the case 3. These exercises give structure on how to utilize some of the service prototyping techniques. Following exercises are described in more detail in Appendix 10:

- 4Boxes –exercise can be used for creating a sketch on four different dimensions of the service proposition.
- Dream Theater structures role-playing of the dream service situation and its comparison to the current offerings.
- MINDwalk structures the imagination process of the whole customer process and experience
- Service mock-up and body-storming testing in AOBC helps in producing a prototype and testing it with a bigger group.

Prototyping exercises or scripts are a good way to collect, store and spread the prototyping knowledge, also the tacit knowledge that the service prototypers gain during their work. Formulating the methods of working in a structured format requires that the knowledge is well processed.

4.5 Good service prototyping practices

One of the aims of the study was to collect information on practices that help in prototyping service propositions.

Setting the deadlines and timetables is the most important, because it keeps the team on going and makes the work more efficient. Before each prototyping round, it is good to *set a deadline for when the testing starts*. It should be a challenging deadline to encourage a focus on getting the prototypes done quickly. It is good to use more time on testing and repairing the prototypes rather than focusing on building the first one. The overall project deadlines should not be too tight, however. There should be enough time to organize co-design sessions with different stakeholders. The empirical study showed that the experimentation-

driven innovation process can be really hectic and there is a lot of practical doing. This was a surprise to these design teams and the customer organizations who had serious challenges to follow up the process. This should be taken into account when forming the design team and timetables.

Create a clear hypothesis for each prototype as guided in the literature. The cases showed that keeping the overall goal of the project in mind all the time guides the testing in general level, but more detailed hypothesis would have been needed to really compare and evaluate the prototypes better. After the empirical study, more help in defining the hypothesis can be found from the recent literature, including Ries (2011) and Passera, Kärkkäinen and Maila (2012).

Parallel prototyping helps to get more prototypes done in shorter timeframe and get variation between the solutions under development. One by one, prototyping easily iterate the solutions around the same idea, where as parallel prototyping affords the opportunity to explore several directions at the same time. Parallel prototyping is especially suitable for prototyping in a service prototyping space. In a real environment, it can be harder to have several prototypes at the same time. It is important to make sure that the customers do not get confused.

Document the prototypes on video and with some kind of analyzing format, example in Appendix 11. In documentation it is important to highlight the best ideas on the prototype as well as the things, which does not work.

The empirical study showed that narrowing the *scope of ideation and making decisions* enables the process to progress. It is good to choose certain target, for instance a customer needing, the service proposition tries to fulfill as early as possible. Pivoting (Ries 2011, p. 149) can be used to change the scope after testing, if the selected direction turns to be unprofitable.

Empirical study showed that it is important to *prepare for the concept prototyping and experience test*. Ideating, rough level sketching and roleplaying seemed to help to prepare the designers for concept prototyping. Concept prototyping prepares for experience test.

During this empirical study, the teams did not have concrete tools to support the prototype planning or manage the process. Meanwhile in this study, there was a wider study of the service prototyping. As a result the Practical Framework of Service Prototyping (Passera, Kärkkäinen & Maila 2012) was created to help the service prototypers with the multiple decisions they are phasing with each prototype. It is suggested that the service prototypers utilize the Practical Framework for Service Prototyping (presented in the chapter 2.5.5) as a tool for *planning the prototyping*. This study complements the Practical Framework for Service Prototyping with a few tools. The analysis on the prototyping techniques, Table 10 in chapter 3.2.2.2, done in this study helps to identify suitable prototyping technique to different experimentation needs, and the analysis of the prototyping environment helps to decide where to prototype in different situations.

4.6 Applications for the service prototyping space

One of the aims of the research was to find new tools to support experimentation-driven innovation process. The initial hypothesis was that services, especially the ones depending on a physical location for their provision, would benefit from a safe place for experimentation and development. The second research question was shaped as:

“How could a service prototyping space support experimentation of service propositions? In which situations and how should it be used?”

In the literature review, it was determined that the solutions to support rough, explorative service prototyping are rare, although especially innovation literature is calling for it. In product prototyping, the rough paper prototyping or mock up building is almost everyday life. An interesting question is: How to encourage service developers to this kind of playfulness?

The service prototyping space concept created in this study provides a playground for service developers and a space to organize service prototyping sessions. The final concept has four core functions. The first function is the service playground on which the service prototyping happens. The team can utilize different experiential prototyping techniques, like body-storming, role-playing, service walk-through, or servicescape building and testing. The second function is concentrated on materials, furniture, tools, and technology to be used in the service prototypes and the documentation. Besides the prototyping area, space for brainstorming, meetings, and mock-up building are needed, so that a team can continuously go back and forth between ideation and experimentation.

The last and essential part of the concept is the guidance and practices on how to utilize the space. It can include rules of thumb for prototypers and structured exercises for utilizing the service prototyping techniques. It should be a continuously updating knowledge base that is shared with the users of the prototyping space.

4.6.1 How could a service prototyping space support experimentation of service propositions?

The initial hypothesis proved to be correct. Based on the interviews and observations, service prototyping space can *help and provide safer environment to experiment* novel and unique service proposition combinations. Entering to the space dedicated to prototyping sets a person on playful and pragmatic mood. It *eases the starting of the prototyping*, and therefore lowers the threshold of experimentation. It was noticed that turning value opportunity ideas into implementation ideas is easier when there is different kind of tools, equipment, furniture and materials available close by.

The literature reviewed for this study demonstrated that prototyping makes ideas concrete (Fulton Suri 2008) so that everyone can grasp them. While prototyping, people are putting themselves in the game figuratively via ideas and in practical terms when acting or role-playing. In the service prototyping space,

prototypers can *control the audience* (Blomkvist 2011) *of the prototype*, which is not often possible while prototyping in the real service environments. This does not mean that the customers should not be involved, the opposite. It means that the prototyping space can create safer feeling to explore new service ideas with selected customers, and the risks are mitigated. A non-public environment reduces the risks of the development project, because the team can utilize the space to pre-test the ideas before going into public validation with them.

Time limitation is one of the challenges most often mentioned in the service design literature (Blomkvist & Holmlid 2010). At least in these cases, the prototyping in service prototyping space was faster than in real environment. Making a fine-tuned, higher resolution prototype in public environment and testing it with regular customers was really time consuming. Service prototyping space located close to your development team can *save time and money* in the pre-testing.

The literature review also revealed that there is a lack of means and practice for designing servicescapes holistically and the design tools for servicescape design are undeveloped (Bitner 1992; Blomkvist 2011). The service space provides a new *tool for designing servicescapes*. It allows to prototype services holistically but on rough level. Building a servicescape and body-storming or role-playing with it is an ideation and pre-validation tool for the service concept. In reality, people are really sensitive on the issues in the servicescape (Bitner 1990), therefore the rough details inevitably included in these unreal servicescapes can create a picture that is only illustrative of the service experience.

During the cases, design teams learned that there is no point investing a lot of time or money in designing the details of the prototype while prototyping in the service prototyping space. Instead, investments should be focused at the point at which a service concept is developed holistically and core details are mapped out. Then it is time to validate it with experience test in more realistic service environment.

The main difference between this service prototyping space concept and the existing solutions mentioned in the literature, SINCO lab (e.g. Rontti et al. 2012) and ServLab (e.g. Meiden & Burger 2010), is the concentration on hands-on doing, inclusion, and holistic perspective to service prototyping. There is no stage, no the audience. All the participants are supposed to experience the service being developed. In ServLab, professional service actors are performing the testing of the service and the stakeholders are observing the action as audience. However the point of prototyping is diving into customer's role and experiencing it (Buchanau & Fulton Suri 2000).

The aim of the service prototyping knowledge bank and structured exercises is to facilitate prototyping session with different kind of stakeholders. With SINCO lab there is a lot of similarities, but the main difference between is that in SINCO lab there is limited space and it is mainly used for prototyping a single touchpoint. In this concept the holistic prototyping including the rough servicescapes is supported. Also parallel prototyping is not supported in SINCO lab or ServLab.

Case 3 showed that *parallel prototyping could increase the efficiency of the prototyping*. Parallel prototyping allows the team to develop several ideas at the same time, and compare and combine solutions of the best possible ideas. Many times it is not an idea that fails, but rather the way in which an idea is implemented. Testing many alternatives even with slight changes can benefit the project.

4.6.2 In which situations and how should the service prototyping space be used?

Based on the cross case analysis of benefits and challenges in different prototyping environments (chapter 3.2.2.4) five different situations when the service prototyping space could be useful is identified.

The first situation when service prototyping space is useful is *when there is no clue what could be a good place to do the experimentation*. When the combination of service touchpoints is radically new and potentially unique (for instance, a completely new service offering, or a hybrid one that mixes different value propositions), the service prototyping space is a safe environment to map different implementations and preliminarily test which kind of combination better satisfies the customer outcomes. For completely new service offerings, there might not exist a suitable real environment where an idea could be tested.

The second situation is *when the overall concept idea is not clear yet, or hypothesis on the best implementation still remain open*, quick rounds of prototyping with lighter techniques can help to make sense of different perspectives and approaches. The service prototyping space becomes a platform for abductive “what if?” thinking; thinking can be further stimulated with specific ideation techniques. Rough service prototyping techniques such as cognitive walk-through, visualizations, role-playing and service walk-through, can be used to grasp at least the most important concrete details that need to be included in the prototype of experimentation test. It is important to keep the prototype fidelity low and utilize the experimentation to test the basic assumptions behind the idea. In addition, building holistic prototypes without having figured out the concrete details is hard and inefficient. The aim of the prototyping in service prototyping space is to come up with the best guess, which is then tested with experience test.

The third use case for the space comes *when a considerable investment or changes would be needed to implement the new idea*, prototyping rounds in service prototyping space can provide support for decision-making, by revealing more clearly the value of the idea for the potential customers and the expenses relating to the solution.

The fourth use case arises *when prototyping in real environment would create a hindrance to the staff or clients*; service prototyping space offers a safe environment to do it.

Besides helping the design work service prototyping space offers *a place to teach and learn how to do service prototyping* (the fifth use case). Utilizing structured prototyping techniques, a person can learn how to utilize certain prototyping method.

As a result of these findings simple heuristics on how to choose the prototyping environment are presented in Table 14. These heuristics were published as part of the Practical Framework of Prototyping (Passera, Kärkkäinen & Maila 2012).

Table 14 Heuristics for choosing the prototyping environment (Published in Passera, Kärkkäinen & Maila 2012)

Prototype in a service prototyping space when:	Prototype in real service environment when:
<ul style="list-style-type: none"> • The real location does not exist yet • The real location is not available for changes • The prototype would be a hindrance to the users and staff interacting in the real location • Different spatial setups need to be tested and are still under exploration • You are unfamiliar with service prototyping and eager to learn 	<ul style="list-style-type: none"> • The space setup is the same, but will be used in a different way when prototyping • It is possible to easily make modifications to the existing space setup, and these modifications do not alter the whole existing business setup • The real contexts is indispensable for validating the prototyping hypothesis

If all the relevant information is pulled together, service prototyping space helps to identify the best guess on what the service is and how the service works, to make the service concept concrete and something people can share and understand. The service experience cannot be validated in a service prototyping space, but it can be used for developing the service concept so far that it is easier to test it with real clients and real environment to validate the business idea.

4.7 Generalizability and limitations of the study

There are few things that affect on the generalizability of the study. First, the design team was formed from the members of the research group. The members were not service prototyping experts as such, although they had been researching the subject. On the other hand, the field of service prototyping is so poorly developed, that finding expert prototypers could have been hard. The situation the team member faced represents the situation many practitioners on the field would have when they are starting to apply service prototyping in their work.

The amount of cases reported in this study was limited to three, which is enough to form a base for findings, but of course more cases could give further validation. All of them represent action research cases, where the researcher participated, either as designer or a tutor of the design team. This might have created a bias to the results along with the researcher's views on experimentation-driven innovation model, which might has affected to all of the examples created in the study. To give further generalizability, additional cases could have been undertaken with design teams formed from external experts.

The empirical data of the action research cases was gathered via interviews and observations of the design work. A lot of the data comes from the observations, and the role of interviews is more conforming. Observing was an appropriate approach given the subject because the work observed is really practical, and

designers would not have been able to report their way of working in so detail in the interviews compared to the data collected by observing. Given that the researcher was a main observer, most of the time, there was a risk of bias in the notes made. It applies to the interview questions and situations.

The service prototyping space build in this study utilized a location that was not suitable for this purpose for the most part. Several unfavorable properties were identified, which are reported in the requirements for the space. However, the more suitable location for instance with easy access from the streets and more central location could have enabled for instance using normal citizens as testers for the cases. These could benefit the prototyping, but also affect on the space concept itself. Therefore further examination with different location of the prototyping space should be done.

The budget of the research project also affected how much technology was used in the space design. There was no possibility to invest a lot of money in the technology. During the concept development phase, the team was not able to test all the ideas they got. The ideas are reported as suggestions for the technology in the concept description.

4.8 Further research agenda

Next phase to explore the suitability of the service prototyping space would be to research how development teams in companies would utilize the space. And, how a prototyping space would integrate to a company's service development process? Where it can or should locate? Should each company have their own playfield or could they use it as a service provided by external parties? These studies would reveal the real potential of the new tool developed for service developers.

The literature calls for knowledge on holistic servicescape design. This study opens up how the servicescape design links to the process of service design, but it does not give details on how to do it. One of the reasons was the limitation the service prototyping location and premises gave us. The limited budget also precluded on testing the possibilities of the technology, for instance smells and lighting opportunities. Details on how to model all the different aspects of servicescape are still needed. The complexity and workload in service development process is pretty tough, which lead to the question: Are some of the aspects more relevant than others? How much a service prototyping space can help in prototyping the servicescape and to which detail? The service prototyping space obviously has limitations, because it is meant to be easily modified and used to model many different contexts.

The experience prototyping lacks tools that would make the process more systematic. Based on the researcher's experience, each experience prototyping process should be considered rather unique. One of the challenges, however, was identifying a suitable place to build the experience test. For testing the business potential and different business models, there also were not any particularly practical tools available.

During the project, the researcher determined that the service prototyping space might be developed into a pop-up business space and that this might enable more fine-tuned prototypes to be developed for experience testing. In this hypothetical context, an entrepreneur or business developer could test their new business ideas without investing in the final solutions outright. The experimentation space should be located close to the people flows, which would allow testing with random people as well. It should contain more fine-tuned prototypes and allow for different tests related to the business model. Research on the needs of entrepreneurs and business developers would be needed to validate the potential suggested here, as well as to outline how this kind of pop-up business space would work, how it would enable easy and economic transformations from different business concepts to the next one, and how the normal people, the test audience, would feel about it.

Further validation of the analysis on the service prototyping techniques presented in Table 10 would be needed.

References

- Arvola, M. & Artman, H. 2006. "Testing a walkthrough methodology for theory-based design of walk up and use interfaces". *CHI '90*, Seattle.
- Anderson, E. & Simester, D. 2011. "A step-by-step guide to smart business experiments". *Harvard Business Review*, Vol. 89, No. 3, pp. 98-105.
- Arvola, M., Blomkvist, J., Holmlid, S. & Pezone, G. 2012. "A Service Walkthrough in Astrid Lindgren's Footsteps. The Case of Astrid Lindgren's Näs". In *conference proceedings of Serv.Des 2012*, 8th-10th February 2012, Espoo, Finland.
- Baker, J. 1987. "The Role of the Environment in Marketing Services: The Consumer". In: Czepiel, J., Congram, C.A. & Shanahan, J. (Eds.), *The Services Challenge: Integrating for Competitive Advantage*, American Marketing Association, Chicago, pp. 79-84.
- Bitner, M. J. 1992. "Servicescapes: The impact of physical surroundings on customers and employees". *Journal of Marketing*, Vol. 56, No. 2, pp. 57-71.
- Bitner, M. J., Ostrom, A. & Morgan, F. 2008. "Service Blueprinting: A Practical Technique For Service Innovation". *California Management Review*, Vol. 50, No. 3, pp. 66-94.
- Blomkvist, J., 2011. *Conceptualising Prototypes in Service Design*. Licentiate thesis. Linköping University
- Blomkvist, J. & Holmlid, S. 2009. "Exemplars in Service Design". In *conference proceedings of the First Nordic Conference on Service Design and Service Innovation*, 24th-26th November 2009, Oslo, Norway.
- Blomkvist, J. & Holmlid, S. 2010. "Service Prototyping According to Service Design Practitioners". In *conference proceedings of the Second Nordic Conference on Service Design and Service Innovation*, 01st-03rd December 2010, Linköping, Sweden.
- Blomkvist, J., Åberg, J. & Holmlid, S. 2012. "Service walkthroughs to support service development". In *conference proceedings of Serv.Des 2012*, 8th-10th February 2012, Espoo, Finland.
- Boztepe, S. 2007. "User Value: Competing Theories and Models". *International Journal of Design*, Vol. 1, No. 2, pp. 55-63.
- Brown, T. 2008. "Design Thinking". *Harvard Business Review*, Jun 2008, pp. 84-92.
- Bryan-Kinns, N., & Hamilton, F. 2002. "One for all and all for one? Case studies of using prototypes in commercial projects". In *proceedings of the second Nordic conference on Human-computer interaction, NordiCHI*, 19th-23th October 2002, Århus, Denmark, pp. 19-23.
- Buchenau, M. & Fulton Suri, J. 2000. "Experience Prototyping". In *proceedings of the 3rd conference on Designing interactive systems: processes, practices, methods, and techniques, DIS*, 17th-19th August 2000, New York, USA, pp. 424-433.

Burns, C., Dishman, E., Verplank, W., & Lassiter, B. 1994. "Actors, Hairdos & Videotape - Informance Design". In *proceedings of the Conference Companion on Human factors in Computing Systems*, 24th-28th April 1994, Boston, MA, USA: ACM, pp. 119-120.

Carroll, J. M. 2000. "Five reasons for scenario-based design". *Interacting with computers*, Vol. 13, pp. 43-60.

Christensen C. 2005. "Marketing malpractice - the cause and the cure". *Harvard Business Review*, Dec 2005, pp. 74-83.

Clark, G., Johnston, R. & Shulver, M. 2000. "Exploiting the service concept for service design and development". In Fitzsimmons, J., Fitzsimmons, M. (Eds.), *New Service Design*. Sage, Thousand Oaks, CA, pp. 71-91.

Clatworthy, S. 2011. "Service Innovation Through Touch-points: Development of an Innovation Toolkit for the First Stages of New Service Development". *International Journal of Design*, Vol. 5, No. 2, pp. 15-28.

D'Agostino, A., Serafini, R. & Ward-Warmedinger, M. 2006. "Sectoral explanations of employment in Europe. The role of services". *Working paper series*, May 2006. European central bank.

Davenport, T.H. 2009. "How to Design Smart Business Experiments". *Harvard Business Review*, February 2009, pp. 68-76.

Diana, C., Pacenti E. & Tassi, R. 2009. "Visualtiles - Communication tools for service design". In *conference proceedings of the First Nordic Conference on Service Design and Service Innovation*, 24th-26th November 2009, Oslo, Norway.

Donovan, R.J. & Rossiter, J.R. 1982. "Store Atmosphere: An Environmental Psychology Approach". *Journal of Retailing*, Vol. 58, No. 1, pp. 34-57.

Dow, S. P., Glassaco, A., Kass, J., Schwarz, M., Schwartz, D. L. & Klemmer, S. R. 2010. "Parallel prototyping leads to better design results, more divergence, and increased self-efficacy". *ACM Transactions on Computer-Human Interaction*, Vol. 17, No. 4.

Dow, S.P., Heddleston, K. & Klemmer, S.R. 2009. "The Efficacy of Prototyping Under Time Constraints". In *C & C '09*, 27th-30th October 2009, Berkeley, USA, pp. 165-174.

Drews, C. 2009. "Unleashing the Full Potential of Design Thinking as a Business Method", *Design Management Review*, Vol. 20, No. 3, pp. 39-44.

Edvardsson, B. & Olsson, J. 1996. "Key concepts for New Service Development", *The Service Industries Journal*, Vol 16, No. 2, pp. 140-64.

Ehn, P., & Kyng, M. 1991. "Cardboard computers: Mocking- it-up or hands-on the future". In Greenbaum, J., & Kyng, M. (Eds.) *Cooperative design of computer systems Design at work*. Lawrence Erlbaum, Hillsdale. pp. 169-195.

Eisenhardt, K. M. 1989. "Building Theories from Case Study Research". *The Academy of Management Review*, Vol. 14, No. 4, pp. 532–550.

The European Network of Living Labs, 2012. webpage, viewed March 2011
<http://www.openlivinglabs.eu/>

Fraser, H. M. 2009. "Designing Business: New Models for Success". *Design Management Review*, Vol. 20, No. 2, pp. 56-65.

Fulton Suri, J. 2008. "Informing Our Intuition. Design Research for Radical Innovation", *Rotman Magazine*, Winter 2008, pp. 52-57.

Gerber, E. & Carroll, M. 2012. "The psychological experience of prototyping". *Design Studies*, Vol. 33, No.1, pp. 64-84.

Govindarajan, V. & Gupta, A. K. 2001. "Strategic innovation: A conceptual road map". *Business Horizons*, Vol. 44, No. 4, pp. 3-12.

Grönroos, C. 1989. "Defining Marketing: A Market-Oriented Approach". *European Journal of Marketing*, Vol. 23, No. 1, pp. 52–60.

Grönroos, C., 2011. "Value co-creation in service logic: A critical analysis". *Marketing Theory*, Vol. 11, No. 3, pp. 279-301.

Hamel, G. 1996. "Strategy as revolution". *Harvard Business Review*, Vol 74, No 4, pp. 69-82.

Hassi, L. & Tuulenmäki, A. 2012. "Experimentation-driven approach to innovation: developing novel offerings through experiments". Published in *XXIII ISPIM Conference*, 18th-20th June 2012, Barcelona, Spain

Hoffman, K.D. & Turley, L.W. 2002. "Atmospherics, Service Encounters and Consumer Decision Making: An Integrative Perspective". *Journal of Marketing Theory and Practice*, Vol. 10, No. 3, pp. 33-47.

Holmlid, S. & Evenson, S. 2006. "Bringing design to services". Invited to present in *IMB Service Science, Management and Engineering summit. Education for the 21st century*, October 2006, New York.

Holmlid, S. & Evenson, S. 2007. "Prototyping and enacting services: Lessons learned from human-centered methods". In *proceedings from 10th Quality in Services conference, QUIS 10*, Orlando, Florida.

Holmström, J., Ketokivi, M. & Hameri, A.-P. 2009. "Bridging Practice and Theory: A Design Science Approach". *Decision Sciences*, Vol. 40, No. 1, pp. 65–87.

Houde, S. & Hill, C. 1997. "What do prototypes prototype". *Handbook of human-computer interaction*, Vol. 2, pp.367–381.

Huddle spaces 2012. webpage, viewed March 2011
<http://huddlespaces.com/portfolio/how/>

- Iacucci, G., Kuutti, K. & Ranta, M. 2000. "On the move with a magic thing: Role playing in concept design of mobile services and devices". In Daniel Boyarski, Wendy A. Kellogg (Eds.). *Proceedings of the Conference on Designing Interactive Systems: Processes, Practices, Methods, Techniques*, 17th-19th August, 2000, New York City.
- Järvenpää, E. & Kosonen, K. 2003. "Johdatus tutkimusmenetelmiin ja tutkimuksen tekemiseen". Otamedia Oy, Espoo. p. 101
- Kim, W.C., Mauborgne, R. 1999. "Creating new market space". *Harvard Business Review*, Jan-Feb 1999, pp. 83-93.
- Kim, W.C. & Mauborgne, R. 2004. "Blue ocean strategy". *Harvard Business Review*, Oct 2004, pp. 76-84.
- Kim, W.C. & Mauborgne, R. 2005. *Blue ocean strategy*, HBS Press, Boston.
- Kim, W.C. & Mauborgne, R. 2009. "How strategy shapes structure". *Harvard Business Review*, Sep 2009, pp. 73-80.
- Kimbell, L. 2011. "Designing for services as one way of designing Services". *International journal of design*, Vol. 5, No. 2, pp. 41-52.
- Kotler, P. 1973. "Atmospherics as a Marketing Tool". *Journal of Retailing*, Vol. 49, No. 4, pp. 48-64.
- Lee, F., Edmondson, A.C., Thomke, S. & Worline M. 2004. "The Mixed Effects of Inconsistency on Experimentation in Organizations". *Organization Science*, Vol. 15, No. 3, pp. 310-326.
- Levitt, T. 1972. "Production Line Approach to Service". *Harvard Business Review*, Vol. 50, pp. 41-52.
- Lim, Y. K., Stolterman, E. & Tenenberg, J. 2008. "The Anatomy of Prototypes: Prototypes as Filters, Prototypes as Manifestations of Design Ideas", *ACM Transactions on Computer-Human Interaction*, Vol. 15, No. 2.
- Lindström, A. 2010. "Palveluiden protoilua näyttämöllä". Blog post, viewed 3. March 2012, <<http://serviceinnovationcorner.blogspot.com/2010/01/palveluiden-protoilua-nayttamolla.html>>
- Lovelock, C. H. 1983. "Classifying Services to Gain Strategic Marketing Insights". *Journal of Marketing*, Vol. 47, Summer, pp. 9-20.
- Lovelock, C. & Gummesson, E. 2004. "Whither Services Marketing? In Search of a New Paradigm and Fresh Perspectives". *Journal of Service Research*, Vol. 7, No. 1, pp. 20-41.
- Lusch, R.F. & Vargo, S.L. 2006. "Service-dominant logic as a foundation for a general theory". In R. F. Lusch & S. L. Vargo (Eds.). *The Service-Dominant Logic of Marketing: Dialog, Debate, and Directions*, M.E.Sharpe, New York, pp. 406-420.

- Maffei, S., Mager, B. & Sangiorgi, D. 2005. "Innovation through service design. From research and theory to a network of practice. User's driven perspective". Paper presented at *Joining Forces: International Conference on Design Research*, 22-24th September 2005, Helsinki, Finland.
- Mager, B. 2008. "Service Design". In M. Erlhoff & T. Marshall (Eds.). *Design Dictionary: Perspectives on Design Terminology*, Birkhäuser, Basel, pp. 354-356.
- Maglio, P., Vargo, S., Caswell, N. & Spohrer, J. 2009. "The service system is the basic abstraction of service science". *Information Systems and e-Business Management*, Vol. 7, No. 4, pp. 395-406.
- Mangini, E. 2011. In Meroni, A. & Sangiorgi, D (Eds.). *Design for service*. Gower Publishing Limited, England
- Markides, C. 1997. "Strategic innovation". *Sloan Management Review*, Vol. 38, No. 3, pp. 9-23.
- Markides, C. 1999. "Dynamic view on strategy". *Sloan Management Review*, Spring, p. 55-63.
- Markides, C. 2008. *Game-changing strategies*, Jossey-Bass, San Francisco.
- Mattelmäki, T. 2005. "Applying probes – from inspirational notes to collaborative insights". *CoDesign*, Vol. 1, No. 2, pp. 83-102.
- McCurdy, M., Connors, C., Pyrzak, G., Kanefsky, B. & Vera, A. 2006. "Breaking the Fidelity Barrier: An Examination of our Current Characterization of Prototypes and an Examples of a Mixed-Fidelity Success". *Proceedings of the CHI*, ACM, Montréal, pp. 1233-1242.
- McGrath, R. G. 2010. "Business Models: A Discovery Driven Approach". *Long Range Planning*, Vol 43, No. 2-3, pp. 247-261.
- McGrath, R. G. 2011. "Failing By Design". *Harvard Business Review*, Vol. 89, No. 4, pp. 76-84.
- Meiren, T. & Burger, T. 2010. "Testing of service concepts". *The Service Industries Journal*, Vol. 30, No. 4, pp. 621-632.
- Meroni, A. & Sangiorgi, D. 2011. *Design for service*. Gower Publishing Limited, England.
- Meyer, S., Johnston, R., Duffy, J. & Rao, J. 2002. "The service concept: the missing link in service design research?". *Journal of Operations Management*, Vol. 20, pp. 121-134.
- Michel, S., Brown, S.W. & Gallan, A.S. 2007. "An expanded and strategic view of discontinuous innovations: deploying a service-dominant logic". *Journal of the Academy of Marketing Science*, Vol. 36, No. 1, pp. 54-66.

- Miettinen, S. 2011. "Service prototyping in Action!". *Touchpoint: the journal of service design*, Vol. 3, No. 2, pp. 64-65.
- Moggridge, B. 2006. *Designing Interactions*, The MIT Press, Cambridge.
- Moritz, S. 2005. *Service Design: Practical access to an evolving field*, thesis Köln International School of Design & University of Applied Sciences Cologne, Germany
- Normann, R. 2001. *Reframing business – when the map changes the landscape*. Wiley & Sons. West Success, England.
- Noström Innovation Lab 2011. website, viewed March 2011, <<http://nordstrominnovationlab.com>>
- Parker, S. 2009. "Social Animals: tomorrow's designers in today's world". *Report of Royal Society for the encouragement of Arts, Manufactures and Commerce*. Retrieved 19.4.2012 from <http://www.thersa.org/_data/assets/pdf_file/0018/210672/RSA-Design-and-Society-SocialAnimals-report.pdf>
- Passera, S., Kärkkäinen H. & Maila, R. 2012. "When, how, why prototyping? A practical framework for service development". Paper published in *XXIII ISPIM Conference*, 18th-20th June 2012, Barcelona, Spain
- Rae, J. 2007. "Seek the magic with Service Prototypes". *Bloomberg Business Week*, 7. September 2007. Retrieved 03 3, 2012, from <http://www.businessweek.com/innovate/content/sep2007/id20070912_418827.htm>
- Ramswamy, R. 1996. *Design and management of service processes: Keeping customers for life*. Addison-Wesley, Massachusetts.
- Ries, E. 2011. *The Lean Startup. How today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*. Crown Business, New York.
- Rontti, S., Miettinen, S., Kuure E. & Lindström A. 2012. "A Laboratory Concept for Service Prototyping – Service Innovation Corner (SINCO)". In *conference proceedings of Serv.Des 2012*, 8th -10th February 2012, Espoo, Finland.
- Rudd, J., Stern, K. & Isensee, S. 1996. "Low vs. High-fidelity". *Interactions*, Vol. 3, No. 1, pp. 76-85.
- Saloner, G. 2011. "Innovation: A Leadership Essential". *Biz Ed*, January/February 2011, pp. 26-30.
- Samalionis, F. 2009. "Can designers help deliver better services?". In S. Miettinen, & M. Koivisto (Eds.). *Designing services with Innovative methods*, Otava Book Printing LTD, Keuruu, pp. 124-135.
- Schrage, M. 2006. "Cultures of Prototyping". In Winograd, T. (eds.) *Bringing Design to Software*, ACM Press, New York.

Service Design Tools. 2011. Website, viewed March 2011. <<http://www.servicedesigntools.org>>

Secomandi, F. & Snelders, D. 2011. "The object of Service design". *Design Issues*, Vol. 27, No. 3, pp. 20-34.

Segelström, F., & Holmlid, S. 2009. "Visualization as tools for research: Service designers on visualizations". In *conference proceedings of the First Nordic Conference on Service Design and Service Innovation*, 24th-26th November 2009, Oslo, Norway.

ServLab 2008. video, viewed 3. March 2012, <<http://www.youtube.com/watch?v=MG8CtKQB6Cw> >

Shostack, L. G. 1977. "Breaking free from product marketing". *Journal of marketing*, Vol. 41, No. 2, pp. 73-80.

Shostack, L. G. 1982. "How to Design a Service". *European Journal of Marketing*, Vol. 16, No. 1, pp. 49-63.

Shostack, L. G. 1984. "Designing Services That Deliver". *Harvard Business Review*, Vol. 62, No. 1, pp. 133-139.

SINCO lab 2012. webpage, viewed 3. March 2012. <<http://www.sinco.fi>>

Smith, A. & Dunckley, L. 2002. "Prototype evaluation and redesign: structuring the design space through contextual techniques". *Interacting with computers*, Vol. 14, No. 6, pp. 821-843.

Stickdorn, M. & Schneider, J. 2010. *This is service design thinking*. BIS Publishers, Amsterdam.

Strandvik, T., Holmlund, M. & Edvardsson, B. 2008. "From the Seller's Offering to the Customer's Needing in a Business-to-Business Setting". Published in *the 24th IMP-conference*, 4th-6th September 2008, Uppsala University.

Tassi, R. 2009. "Communication methods supporting design processes", website retrivied on 20.4.2012 from <http://servicedesigntools.org/>

Tekes 2007. "Seizing the White Space: Innovative Service Concepts in the United States". *Technology Review* 205/2007. Available at: www.tekes.fi/en/document/43000/innovative_service_pdf

Thomke, S.H. 1998. "Managing Experimentation in the Design of New Products". *Management Science*, Vol. 44, No. 6, pp.743-762.

Thomke, S.H. 2003. *Experimentation matters - unlocking the potential of new technologies for innovation*. Harvard business school press, Boston.

Thomke, S., Hippel, E. V. & Franke, R. 1998. "Modes of experimentation: an innovation process — and competitive — variable". *Research Policy*, Vol. 27, pp. 315-332.

- Turner, P. & Turner, S. 2010. "Is stereotyping inevitable when designing with personas?". *Design studies*, Vol. 32, No. 2011, pp. 30-44.
- Tuulenmäki, A. 2010. *Lupa toimia eri tavalla*, WSOYpro, Porvoo.
- Tuulenmäki, A. & Välikangas, L. 2011. "The art of rapid, hands-on execution innovation". *Strategy & Leadership*, Vol. 39, No. 2, pp. 28-35.
- Vaahtojärvi, K. 2010. *Palvelukonseptin varmistaminen prototypoinnin keinoin*, master thesis, Aalto yliopisto. Taiteellinen korkeakoulu
- Vaajakallio, K., Mattelmäki, T., Lehtinen, V., Kantola, V. & Kuikkaniemi, K. 2009. *Literature Review on Service Design*, University of Art and Design Helsinki & Technical University of Helsinki
- Vargo, S. L. 2008. "Customer Integration and Value Creation". *Journal of Service Research*, Vol. 11, No. 2, pp. 211-215.
- Vargo, S. L. 2012. *Tekes - Serve Annual Seminar*. Presentation, 26th April 2012, Helsinki, Finland
- Vargo, S. L. & Akaka, M. 2009. "Service-Dominant Logic as a Foundation for Service Science: Clarifications". *Service Science*, Vol. 1, No.1, pp. 32-41.
- Vargo, S. L. & Lusch, R. F. 2004a. "Evolving to a New Dominant Logic for Marketing". *Journal of Marketing*, Vol. 68, No. 1, pp. 1-17.
- Vargo, S. L. & Lusch, R. F. 2004b. "The four services marketing myths: Remnants from a manufacturing model". *Journal of Service Research*, Vol. 6, No. 4, pp. 324-335.
- Vargo, S. L. & Lusch, R. F. 2008. "Service-dominant logic: continuing the evolution". *Journal of the Academy of Marketing Science*, Vol. 36, No. 1, pp.1-10.
- Vargo, S. L., Maglio, P. P. & Akaka, M.A. 2008. "On value and value co-creation: A service systems and service logic perspective". *European Management Journal*, Vol. 26, No. 3, pp. 145-152.
- Voss, C. & Zomerdiijk, L. 2007. "Innovation in Experiential Services – An Empirical View". In DTI (Ed.) *Innovation in services*, DTI, London, pp. 97-134.
- Ward, J.C., Bitner, M.J. & Barnes, J. 1992. "Measuring the Prototypicality and Meaning of Retail Environments". *Journal of Retailing*, Vol. 68, No. 2, pp. 194-220.
- Wong, Y.Y. 1992. "Rough and ready prototypes: lessons from graphic design". In *Proceedings of CHI '92 Posters and Short Talks*, May 1992, ACM Press, pp. 83-84.
- Zeithaml, V., Parasuraman, A. & Berry, L. 1985. "Problems and Strategies in Services Marketing". *Journal of Marketing*, Vol. 49, No. 2, pp. 33-46.
- Zelkowitz, M. V. 1980. "A case study in rapid prototyping". *Software: Practice and Experience*, Vol. 10, No. 12, pp. 1037-1042.

Appendices

Appendix 1 Interview questions for design team members

In all cases, the design team members were interviewed after the case was finished.

Overall project:

- Describe your role in the concept development project.
- Describe the activities you did in the project. Describe the process from idea to the final concept.

Experiments:

- Describe the experiments you did during the project. What were the goals of them? How much iteration did you do for different ideas? Do you think the experiments succeeded or failed? What did you learn?
- How did feel about the experimentation activities? Did you find something hard or challenging? What made it hard in your opinion? Was something easy? Did you feel depressed at any point of the project? Did you feel enlighten in some point?

Co-operation and roles of different stakeholders:

- How was the co-operation with case client?
- How many test persons did you have? What kind of feedback did you get from the test people? How did you collect the feedback? Did the test people give you some ideas? How did they experience the test situation in your opinion?

End results and learning:

- How did the project succeed all in all? Did the project meet the objects?
- What would you do differently next time, if you had a similar task in front of you again? How would you enhance the innovation process? What did you learn during the process?

Experiences on the AOBC space:

How did AOBC space serve in the experimentation activities? Would you enhance the space? How?

Appendix 2 Pre-interview questions for case clients

Case clients of the Park case (case 2) were interviewed before the case.

Background of the interviewee:

- What is your role in the organization?

General development activities in the organization:

- Are you having enhancement ideas relating to your work? What do you do with those ideas?
- How would you describe the process of development of business ideas in your organization?
- What do you think are the biggest challenges in bringing the business ideas into practice?

Experimentation experience:

- Do you remember any examples of an experiment done in your organization? What was experimented and how? How did it succeed?
- Have you been involved in an experiment?
- Do you remember an example of failed experiment? How did the organization react to it? What kind of feelings did it bring up in the organization?

Expectations of the project:

- If you had a magic wand, how would you start experimenting with business ideas in your organization?
- What are your expectations about the project?

Appendix 3 Pre-questionnaire for the case clients

In the case 3, the immaterial shop, the case clients expectations for the project were mapped with the following questionnaire before the case started.



ACT OUT OF THE BOX CENTER

www.mindspace.fi
Anssi Tuulenmäki
anssi.tuulenmaki@kk.fi

Nimi: _____

Organisaatio: _____

Tämän kyselyn tarkoituksena on kartoittaa projektiin liittyviä ennako odotuksia.

MINKÄLAISIA ODOTUKSIA ORGANISAATIOLLASI ON TÄSTÄ PROJEKTISTA?

MINKÄLAISIA ODOTUKSIA SINULLA ITSELLÄSI ON TÄSTÄ PROJEKTISTA?

MITKÄ OLIVAT WORKSHOPIN TÄRKEIMMÄT TULOKSET SINULLE?

MITÄ OPIN TÄMÄN PÄIVÄN WORKSHOPISTA?

MITÄ VOIT ITSE TEHDÄ JOTTA PROJEKTI SAADAAN MAHDOLLISIMMAN HYVIN KÄYNTIIN?

Appendix 4 End result evaluation sheet for the case clients

The case clients of the Immaterial shop case, case 3, were asked to evaluate the design results with the following questionnaire sheets.

Nimi:
Organisaatio:

M!ND

Aineeton kauppa - konseptin arviointi

Kirjatkaa ylös esityksen aikana ja sen jälkeen
konseptin vahvuuksia (**plussat**)
ja heikkouksia (**miinukset**).

PLUSAT

MINUKSET

M!ND

Nimi:

Organisaatio:
Kaupan muoto

Mitä kauppa tarjoaa

Merkitse, mitkä toteutusmahdollisuudet olisivat organisaationne kannalta mielenkiintoisia. Merkkää raksi ruutuun.	Pop-up store / Kampanja	Verkkokauppa	Kaupalliiketilä
Idea + kortti			
Idea + infoa toteutuksesta + kortti			
Idea + palvelu & info + kortti			

M!NDNimi:
Organisaatio:

Kokemukset projektista

1) Mitä opit tänään tai prosessin aikana?

2) Onko organisaationne valmis kehittämään toimintaa kokeilujen kautta? Mitä pitäisi tapahtua, jotta olisi?

3) Miten parantaisit prosessia ja miten muuttaisit omaa toimintaa / oman organisaation toimintaa, jotta saisitte mahdollisimman paljon irti vastaavanlaisesta yhteiskehityksestä?

Appendix 5 After the case interview questions for case clients

Case clients representatives, case 2 and 3, were interviewed after the case.

The experimentation culture of the organization: (this part only in case 3)

- How would you describe your organizations development culture?
- What is your role normally in development projects?
- Do you remember any example of successful experiments in your organization? How was it? Did you participate? Were there some benefits or disadvantages raised because of the experiment? How did the organization react to the experiment?

The case project generally:

- How did you participate to this concept development project? What was your role?
- How do you find the end result? Did the project meet expectations? What was successful? What failed? Any surprises?

The experiments:

- How do you feel about experiments done during the project? Were they successes or failures? Was there some example that remained in your mind (to be beneficial / useless)?
- Is there something we should have experimented with more? Is there something that should have been left out?
- How do you think the experiments would have served your organization even more?
- Was there something challenging in the process?

The roles and participation:

- What do you think about the roles of case company and Aalto University? Was the role division successful? Would you have wanted something done differently?

The learning:

- How is your organization going to proceed with the concept developed during the case? How and when?
- What did you learn during the process? Do you have any enhancements to the process or co-operation with case companies?

Appendix 6 List of explored service design techniques

- Body-storming – assembling a system and trying and acting out different ideas and possible solutions. It needs to be facilitated and documented (Moritz 2005).
- Constructive interaction – users are asked to think aloud and observed during a given task (Service Design Tools 2011).
- Cognitive walkthrough – imagining a service by going through the stages of client journey. (Arvola & Artman 2006)
- Customer journey map – oriented graph that describes the journey of users by representing the different touchpoints (Service Design Tools 2011). See also storyboard.
- Design games – A design session that is as a form of game as a common platform of communication (Service Design Tools 2011).
- Ethnographic methods (Lehnen, Kuikkaniemi 2009).
- Experience prototyping – is testing the service experience through an active participation of the users or adaption of user's role (Buchenau & Fulton Suri 2000). Trying and testing ideas and components of the service in the context of real life. Often this means reassembly of the reality to frame the environment and the expectations and utilization context. (Moritz 2005).
- Experience test – a test person is observed and interviewed afterwards about how a service is experienced. The experience is tested in an environment that is as close to reality as possible, sometimes even in a reality. (Moritz 2005).
- Evidencing – methodology in which the designer creates objects and images to explore how the proposed innovation will feel and work (Moggridge 2006). Based on the Shostack's (1977) service evidence.
- Heuristic evaluation – a method for inspecting of the service's usability based on a predefined set of criteria. (Service Design Tools 2011)
- Informance – a methodology in which an idea is acted to tell, explain and share it. Actors can be professionals or not. (Service Design Tools 2011).
- Mystery shopping – test method for current service offerings where actors or designers act as “normal customers”. A service is consumed and then the tester reports their experience. (Moritz 2005).
- Mood-board – illustration method for visualizing the mood and atmosphere (Moritz 2005; Service Design Tools 2011).
- Mood-film – similar purpose than in mood-boards put the format includes sequence and voice (Moritz 2005).
- Narratives – a way of communicating the idea for a service (Lehnen & Kuikkaniemi 2009).
- Personas / character profiles / user descriptions – representation of users of the services that base either in qualitative studies or are fictional characters (Moritz 2005; Service Design Tools 2011).
- Pluralistic walkthrough – usability inspection with a diverse group of stakeholders. Primary tasks of the service are stepped through to identify potential problems. (Moritz 2005).
- A probe – is a tool to be used to gain qualitative data of the person's life or certain situation. It is a collection of tasks to elicit information. (Moritz 2005).

- Retrospective testing – after the testing clients can see the testing session which has been videotaped. They can make additional comments while watching. (Moritz 2005).
- Role-playing – sample users or the designers perform a hypothetical service experience. It can be utilized for same scene several times with different user profiles. (Arvola & Artman 2006; Service Design Tools 2011)
- Service blueprint - Process diagram and model of all details in the service design (Shostack 1977; 1984; 2001).
- Service Image – a unique picture that is able to give in one shot an immediate idea of the main features of the service (Service Design Tools 2011).
- Service walkthrough – testing the service journey holistically, by utilizing body-storming, role-playing and experience prototyping to embody and enact insights into how the service was perceived and how it performed (Blomkvist, Åberg & Holmlid 2012).
- Shadowing – following a clients behavior in their natural environment performing tasks and consuming services. It is important not to influence the behavior of the clients. (Moritz 2005). See also Wizard of Oz.
- Sketching – drawing the ideas.
- Storyboard – a tool to describe the use cases with a sequence of pictures or drawings to create a narrative of the customer journey (Service Design Tools 2011).
- Tomorrow's headlines – fictional articles in which the designers imagine future scenarios and what kind of impact the service will have (Moritz 2005; Service Design Tools 2011).
- Touchpoint cards (Clatworthy 2011) – a tool for ideation of service processes.
- Use cases – used to make rough descriptions of the functionality of the service, used in development of interaction flows (Service Design Tools 2011).
- Wizard of Oz – test a service in detailed way by observing the interaction of the potential user without revealing the evaluator's presence (Service Design Tools 2011). See also Shadowing.

Appendix 7 Descriptions of the service prototyping techniques

Cognitive walk-through

The cognitive walk-through originates from interaction design and it has been used in usability testing for long time (Arvola & Antman 2006). When applied to services, in a cognitive walk-through, a person or a group of people will think aloud through a customer journey of a service (Moritz 2005). The cognitive walkthrough can be used for existing service or it can be a totally imagined new service. Prototypers can utilize a mock-up of the service touchpoint or the servicescape or even the real service environment as to structure the discussion and thinking. It also includes thinking about client profile; especially the knowledge client has in different service moments. (Ipid).

The idea in a cognitive walkthrough is not to act or play the service experience – but to think aloud and imagine it through, to enact to the service (Arvola & Antman 2006). Thinking aloud during the mental walk-through enables others to observe, and later give some feedback about the prototyping. Each person participating to the cognitive walk-through produces their own mental picture and experience the service with it. Cognitive walk-throughs can be documented with taking notes or videotaping the process.

Table 15 reflects cognitive walk-through against the service prototyping techniques developed in chapter 2.5.4.4.

Table 15 Cognitive walk-through as service prototyping technique

Criteria for service prototyping technique	Reflection
Produces a representation or an embodiment of the idea	A cognitive walk-through creates a mental picture of the service concept. This mental picture can be considered as a representation of the service.
Provide a chance to reflect the idea against the hypothesis	The mental picture of the service can be compared against the hypothesis. With cognitive walk-through the team can find out flaws and problems from service concept.
Takes into account the holistic nature of service	The cognitive walk-through concentrates on the interaction and service journey, but sentiment on the customer profile, customer knowledge (Moritz 2005), service environment and service evidence comes along the thinking process.
Enable to consider the customer perspective	The service is looked with customer eyes (Arvola & Antman 2006; Moritz 2005).

Sketching

In sketching an idea is quickly drawn and written. In sketching the drawing should be kept simple, like stick men (Moritz 2005).

In Table 16, sketching is reflected against the criteria set for service prototyping technique developed in chapter 2.5.4.4. Sketching can be conflicting against the criteria; sketch as such does not allow the testing of a hypothesis behind an idea. Sketching, however, can be used as way to support storytelling and sharing of ideas. If it is utilized as a tool of discussion to test certain ideas, then it can be considered as service prototyping method.

Table 16 Sketching as service prototyping technique

Criteria for service prototyping technique	Reflection
Produces a representation or an embodiment of the idea	Sketching creates a drawing.
Provide a chance to reflect the idea against the hypothesis	The sketch itself or sketching action does not necessarily allow testing against a hypothesis, but it can be utilized as a tool to share stories and then test the assumptions relating to the story.
Takes into account the holistic nature of service	Sketches can represent different service dimensions.
Enable to consider the customer perspective	Depends from which point of view the sketches are made.

Storyboarding

Storyboarding means visualizing a set of events or key situations each on one sheet. Normally, the text or a story along the sketched picture is needed. Service storyboard is a step-by-step explanation of the customer journey. It can be divided to the front stage and back stage parts if both are important to be shown. (Moritz 2005). Storyboarding can be used to create the representation of a service, and in discussions this can be used to test the ideas against specific hypothesis.

Table 17 reflects storyboarding against the service prototyping techniques developed in chapter 2.5.4.4.

Table 17 Storyboarding as service prototyping technique

Criteria for service prototyping technique	Reflection
Produces a representation or an embodiment of the idea	Storyboard consists of series of pictures and writing.
Provide a chance to reflect the idea against the hypothesis	Storyboarding is a tool to share stories and the analysis of storyboards can contain reflection against the hypothesis.
Takes into account the holistic nature of service	Concentrates on the customer journey, alias the customer process, but can include considerations on customer, the physical artifacts, information or servicescape.
Enable to consider the customer perspective	The service process is described from customer perspective (Moritz 2005).

Scenario creation

Scenarios are stories that focus on specific individuals and tasks and the assumptions behind them. Scenarios can be used to illustrate customer needs, wants and actions (Carroll 2000). The point is to illustrate the idea of the service in the context of the client life (Moritz 2005). The customer's thinking process how they reason in different actions and decision points and how they experience the service can be described (Carroll 2000). Different client characters can have their own scenarios, which explain how the service might differ.

Scenarios are stories expressed with text, animation or film. Scenario creators should avoid placing too many details or viewpoint to the same scenario might is not usable. (Moritz 2005). With scenario descriptions, the differences between ideal service experiences and service problems can be described. The creation process embeds the customer perspective (Holmlid & Evansson 2007).

Table 18 reflects the scenario creation against the service prototyping techniques developed in chapter 2.5.4.4.

Table 18 Scenario creation as service prototyping technique

Criteria for service prototyping technique	Reflection
Produces a representation or an embodiment of the idea	Scenarios are stories that are written, animated or filmed (Moritz 2005).
Provide a chance to reflect the idea against the hypothesis	Scenarios illustrate the idea of the service in the context of the customer's life (Moritz 2005). Scenarios visualize how different hypothetical situations are likely to look.
Takes into account the holistic nature of service	Scenarios are holistic description of the customer, the customer journey and service context.
Enable to consider the customer perspective	Scenarios are described from customer perspective.

Role-playing and improvisation theater

Role-playing and improvisation theater means that a person acts out how the service works. The focus is in interaction between people or people and service touchpoints; therefore it highlights the intangible nature of services. (Lehnen & Kuikkaniemi 2009).

The same service situation can be played multiple times with different user characters with different moods and knowledge. The role-play can be planned with help of a narrative or a storyboard or improvised along the go. It allows designers and users to enact and perform service experiences before they have been established in an organization. (Lehnen & Kuikkaniemi 2009).

There is still lack of knowledge of good practical techniques for role-playing, some examples can be found service walkthrough -technique from Blomvist, Åberg and Holmlid (2012) and Situated and Participative Enactment of Scenarios (SPES) from Iacucci, Kuutti & Ranta (2000). Service prototypers start to get used to it, but many times there are stakeholders involved who have challenges in throw oneself in.

Table 19 reflects role-playing against the service prototyping techniques developed in chapter 2.5.4.4.

Table 19 Role-playing as service prototyping technique

Criteria for service prototyping technique	Reflection
Produces a representation or an embodiment of the idea	The representation is the play created during the acting of the service.
Provide a chance to reflect the idea against the hypothesis	Playing out the service situations allows to test the idea and learn how service works and how it is experienced.
Takes into account the holistic nature of service	Acting focuses on interaction and service process, but probes and servicescape can be used to frame the act.
Enable to consider the customer perspective	Depends which roles are played out, but normally the technique is used for enacting to customer's role.

Body-storming

Body-storming is a mix of improvisation theater and brainstorming. In body-storming, participants are not just active thinkers, they are acting out the situations. The resources and preparations are kept simple. A body of the person, for instance, can perform a certain touchpoint (Moritz 2005) or simple mock-ups can be used along the ideating and acting around them to generate design suggestion and evaluate them (Burns et al. 1994).

Table 20 reflects body-storming against the service prototyping techniques developed in chapter 2.5.4.4.

Table 20 Body-storming as service prototyping technique

Criteria for service prototyping technique	Reflection
Produces a representation or an embodiment of the idea	The representation is a play of the service situation and system.
Provide a chance to reflect the idea against the hypothesis	Playing out the service situations allows to test the idea and learn how service works and how it is experienced.
Takes into account the holistic nature of service	Body-storming focuses on interaction and service process, but probs and servicescape can be used to frame the act.
Enable to consider the customer perspective	Depends which roles are played out, but normally the technique is used for enacting to customer's role.

Service walk-through

In a service walkthrough, the entire service journey is prototyped. Each service touchpoint is represented with a mock-up; some one is acting the roles of service provider and the customer. The aim is to go through the service step by step both customer and service provider's perspective. Time frame can be condensed and the details should be kept on rough level. (Blomkvist, Åberg & Holmlid 2012).

Service walk-through provides embodied and enacted insights into how the service is perceived and how it is performed. It helps to identify the flow of information, problematic areas and design opportunities. (Blomkvist, Åberg & Holmlid 2012).

The walkthrough of the service process combines role-playing, paper prototyping, product mock-ups, body-storming, and experience prototyping as a holistic prototype considering entire service journey. It is possible to generate validated knowledge of the service experience quickly from multiple perspectives. Service walk-through can be utilized as an ideation tool, for instance, as live version of the What if technique – what will happen if an order is not prepared on time, what will happen if the customer is not home, in what order should service be delivered, etc. (Blomkvist, Åberg & Holmlid 2012).

According to Arvola et al. (2012), it is hard to produce real experience when low resolutions mock-ups or with un-real context is used.

Table 21 reflects service walk-through against the service prototyping techniques developed in chapter 2.5.4.4.

Table 21 Service walk-through as service prototyping technique

Criteria for service prototyping technique	Reflection
Produces a representation or an embodiment of the idea	The representation is a role-play of the service journey including low-resolution mock-ups in un-real or real context.
Provide a chance to reflect the idea against the hypothesis	Playing out the service situations allows to test the idea and learn how service works and how it is experienced. It is a rough validation tool, and therefore the hypothesis can be tested.
Takes into account the holistic nature of service	Service walk-through considers interaction, process, information, most important physical artifacts and considerations of the servicescape.
Enable to consider the customer perspective	Both customer and service provider's experience and process is modeled.

Modeling and testing servicescape

There are several ways to model servicescapes. One way is use projection of pictures or video of real or virtual reality; another way is to create a mock-up of the servicescape. Besides the visual aspects, audio and smells can also be modeled and produced. Role-playing and testing the servicescape is important part of the prototyping activity.

Servicescape forms from ambient, design and social factors (Baker 1987, p. 80) see Table 3 in 2.3.3.5. Servicescape affects on expectations of the service (Bitner 1992), the service experience itself (Hoffman and Turley 2002) and the behavior of the employees and customer (Baker 1987; Bitner 1992; Hoffman & Turley 2002).

The aim of servicescape design is to make the intended behavior easier and restrict un-wanted behavior, also feelings and physical well-being has to be considered (Bitner 1992). In servicescape modeling, the most important aspects of servicescape, like architecture layout, style, signage, and noise level should be modeled and simulated to figure out what kind of experiences the design creates. According to Meiden and Burger (2010), the aim is to produce and manipulate the prototyping environment to as close as possible to actual or intended reality.

Table 22 reflects the cognitive walk-through against the service prototyping techniques developed in chapter 2.5.4.4.

Table 22 Servicescape modeling and testing as service prototyping technique

Criteria for service prototyping technique	Reflection
Produces a representation or an embodiment of the idea	The representation can be done with a projection or with mock-up building. Smells and sounds can be also part of it.
Provide a chance to reflect the idea against the hypothesis	Playing out the service situations allows testing how service environment works and supports the process and how service is experienced. It is a rough validation tool, and therefore the hypothesis can be tested.
Takes into account the holistic nature of service	Servicescape modeling concentrates on servicescape and touchpoint artifacts and information. If it is tested with role-playing or with service walk-through also interaction and process are covered.
Enable to consider the customer perspective	Both customer and service provider's experience is modeled.

Experience test

In experience test the core of the service is tested in more realistic environment and customer context. The verisimilarity of the service is near to real, although the service is simplified. The aim is to test service experience and does the service bring the intended outcome, meaning that those aspects that affect on experience and satisfaction are on focus. In literature several terms have been used to refer to on-site/real service environment prototyping, at least experience test, experience prototyping and service experience prototype (Moritz 2005) could be found.

Experience prototype can be placed in real environment or other locations. Building a service experience prototype might need a lot of effort to make the environment and situation as real as possible, but with some service it is much simpler (Moritz 2005).

Table 23 reflects experience test against the service prototyping techniques developed in chapter 2.5.4.4.

Table 23 Experience test as service prototyping technique

Criteria for service prototyping technique	Reflection
Produces a representation or an embodiment of the idea	The representation is the holistic service system mock-up that is created or existing service system that is modified for the testing.
Provide a chance to reflect the idea against the hypothesis	Service is tested as it would be a real service. The aim is to check what kind of service experience and outcome can be reached.
Takes into account the holistic nature of service	It should cover all the important details holistically.
Enable to consider the customer perspective	Both customer and service provider's experience is modeled.

Appendix 8 Case videos

*For each case the final concept and design process is summarized as short video.
Content:*

1. *Rocking the nightclub industry* <http://youtu.be/5nmIh0nhy1w>
2. *Best park in the world* <http://youtu.be/d5lRayFGSaM>
3. *Immaterial shop concept* <http://youtu.be/3ONCHse6bGk>

Appendix 9 A story on how service prototyping space concept was developed

The service prototyping space called Act Out of the Box Center was developed iteratively during nine months along the two constructive cases, case 1 and 3. Research team utilized design-based research approach as guideline for the development.

The original space

The 65-square meter space was located in the cellar of the Venture Garage building. The materials and atmosphere of the space were challenging. The walls were dirty, crossed by IT-cable channels and without windows; the ceiling was filled with piping and electricity cables; the floor was made of concrete, so it was hard, gray and ugly. The fluorescent tube lighting was hard and bleak, placed among the pipes in the ceiling.

The first development round

Preliminary ideas on how to equip the space were developed in January and February, 2011, at the beginning of the project. The smaller room was planned to be a storage room for the prototyping materials, and the larger room the main experimentation area. The team considered that the space itself should be neutral, while the changes in decorations, movable walls, colors, and lighting should be easy to make.

The first problem to be solved was the look and feel of the existing walls: it would be impossible to have a realistic, nice looking servicescape if there are cables and smudges on the wall. Additionally, the original walls were made in concrete, which made hard and time-consuming to mount extra elements (e.g. shelves or decorations). These operations would also quickly ruin the walls even more. Consequently, the walls needed to be covered. The solution had to solve the problems with the looks, the layout flexibility and the possibility to fix things on the walls. The team designed fake, movable walls to be placed in front of the original walls. The production was ordered from a woodwork company specialized in building theater scenographies.

Figure 55 shows the location of the walls and the structure. Furthermore, two extra movable wall elements were ordered. The elements were originally white, but easily paintable with other colors. The weight of the wall elements was reasonably light, so two people could move that one element easily. However, they were built with a material resistant enough to allow objects to be hanged or fixed on the structure.

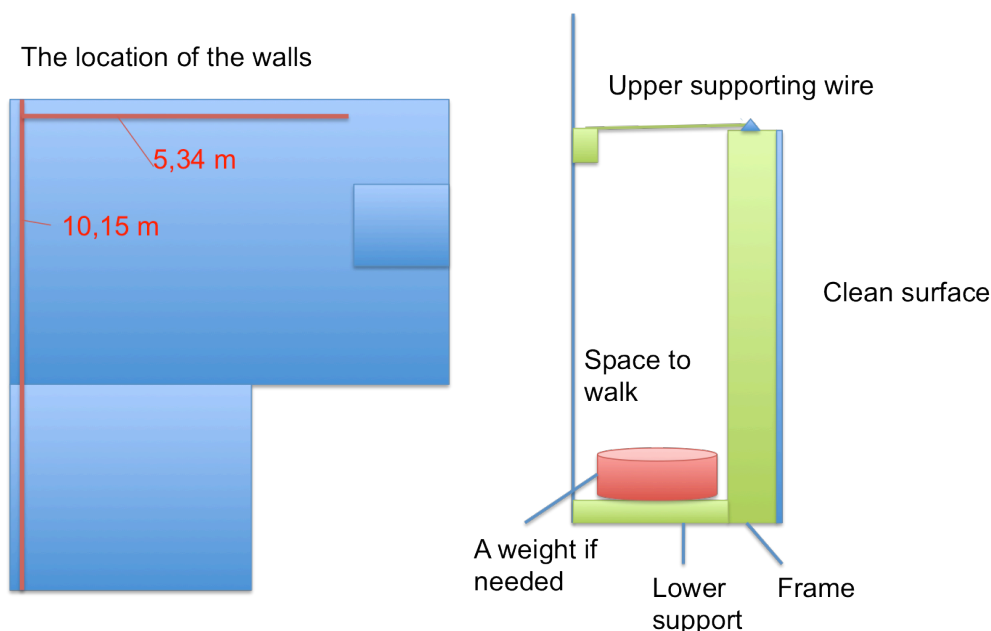


Figure 55 Structure of the movable walls

By chance, the team found a pile of large, unused fabrics in the storage room, so they tested how these could be used as decoration elements. The team found out that they would work as curtains, as extra space dividers and as a way to change the color of the wall panels more quickly than painting. The pipes in the ceiling were used to hang the curtains. Some extra wires were placed across the ceiling, so as to have more flexibility with the positioning of the fabrics.

The lighting expert of the team considered the lighting of space really challenging, because of the pipes and cables on the ceiling and the lack of natural light. She considered that the light should come from different directions. Additionally, a system to allow changes in light color and intensity would be needed. In an optimal situation, the lighting of the space would have been completely substituted with a flexible lighting system, along with some movable indirect lighting options, but because the team didn't know yet exactly what kind of lighting needs different experimentation cases would require, they decided to start the project by simply having different kinds of cheap movable lights. A set of lights was bought from Ikea.

The atmosphere of the space is only one element of space flexibility. The second is the availability of different props and furniture that can be used in different service prototypes. Although each design case has the need for specific props - and case specific purchases were needed - the team considered that there might be some common elements in many service spaces. A selection of closets, tables and tools that could be used for multiple purposes were bought from IKEA, while different small props and objects were collected with the contribution of the Aalto Design Factory community.

These arrangements created the basic equipment and setup for the space, which was tested in the first design case. During the case, the space was further enhanced in a second development round, which took place in April.

The first test and analysis

The first experiments in the space revealed several challenges on the space concept. It is really hard to create a realistic-looking service environment. For instance, the first design case was about developing an innovative service offering in the nightclub industry. The team tried to re-create a nightclub environment, in order to support the experimentation with the elements of the servicescape, but they didn't manage to create an authentic environment. More information about what kind of prototypes and experiments were conducted is provided in chapter 3.1.1.

All the challenges gathered during the first nightclub experiments are listed in list below:

- The location: The fact that the AOBC space is basically located in a cellar affected a lot the feeling of the testers and of the experiment developers alike. The long, gray corridor that leads to AOBC intensified the feeling of the falsity of the service simulation.
- Roughness: the space always looked a bit broken, hand-made, not polished
- The space was too small to represent certain business settings (e.g.. the nightclub): it is hard to create a very similar spatial experience, and, in the nightclub case, to recreate the several spaces needed (e.g.. bar, cloakroom, dance floor, toilets, and some other extra spaces depending on the concept).
- The room height is too low, and so it affects the possible decor and the overall experience.
- The nightclub lighting was hard to reproduce, since it needs both enough colored and flashy lights, and enough darkness. In this case the original ceiling lights were not used at all, only the movable lights were used. With this relatively small amount of generic lights it was hard to create the right color, intensity and quality of the real nightclub lighting.
- It was too complicated to move the backdrop walls, because of the screws and joints keeping the structure together. Additionally, the support structure needed for the backdrop walls didn't allow the elements to be used as partition walls of the space, because it would take 70 cm space in between the two sides of walls.
- The fabric walls looked too much like curtains, so they didn't contribute to create the right spatial experience.
- The plain IKEA furniture was, in the end, too white and neutral. This did not work at all, for instance, in recreating the nightclub servicescape.
- The floor needed to be totally covered: gray concrete is not a common choice for B2C servicescapes. Covering it up with pieces of carpet didn't help to improve the overall feeling of finishedness.
- The space and the corridor leading to it had, to say the least, a "peculiar" smell due to some waterpipes and the lack of windows. Some days, the smell was utterly disturbing
- The location was separate from the working premises, the brainstorming facilities, which created a threshold for the users to do quick and dirty prototyping.

The second development round

The second development round was done while the first design case was ongoing, because there were so many challenges in the experimentation in the space.

Some major issues could not be solved in any way, (e.g. the location and some of its features). At this point, the development team already knew that the location was not suitable for prototyping space, therefore further on they concentrated on gathering as much information as possible about what kind of space would be ideal, and what kind of equipment and methods would be helpful in service prototyping space.

However, still few changes were undertaken to the space. First, the floor was covered with a large blue floor mat that managed to provide a more uniform and pleasant surface. Second, a small video projector was used to provide still or animated backgrounds on the white walls, in order to recreate a more verisimilar service atmosphere. Third, more furniture was bought and also case-specific furniture was collected.

Finally, the ceiling still remained problematic, because it could not be properly masked in any way. The air-conditioning vents and the sprinkler system also needed to be left uncovered.

Without a professional lighting partner, the lights could only be minimally improved. More movable lights and led bars, which change colors and can be controlled remotely, were bought. All the electric sockets were equipped with remote controllers, to allow a more easy control over the movable lamps.

To address the need of instructions and signage, several chalkboards were produced, to work as signs, pricelists etc. Chalkboards were chosen, because it is easy to clean, hang, and it is also often used in service environments where information is often changed, such as bars, restaurants, hairdressers. They are also used for advertising special or temporary offers. Different types of paper were brought in, to support the brainstorming and service blueprinting phases.

The second analysis and testing phase

The second analysis phase included the rest of the first case and the start of the third case. Here is the list of challenges in spatial design that emerged in the second analysis phase:

- The space did not support for having multiple service prototypes testable at the same time. In the third design case, when the stakeholders' team came to give feedback on the concepts, it was necessary to have all of the five different prototypes to be testable at the same time.
- Special spaces dedicated to brainstorming and to prototype/mock-ups building are needed.
- There was not enough guidance on how to concretely do service experimentation provided for external users.
- It was hard to keep track of what kind of materials are in the storage room,

which ones are finished and need to be bought again, and which other materials needed to be added to the stock.

- A bigger amount of materials, and also materials that can be used to build things quickly, would be needed. A contiguous workshop would support the possibility of creating and bringing to AOBC structures and props.
- The video projector was too weak to provide big and vivid backgrounds for the servicespace simulation.
- The space didn't support project documentation and communication. The team didn't work with their cases every day, so each time it felt that the project had to be restarted again. The challenges were related to how to save and document ideas, service visualizations (customer journey map, sketches, mock-ups, etc) and the spatial setup prototyping sessions. Mobile phones were used for taking pictures and videos, but the AOBC space in itself didn't support this central teamwork practice.
- Higher fidelity prototypes are too demanding to do in the AOBC.

The second design case revealed that sometimes there is no point to even try to utilize the AOBC. The case was about services in a park, and there is simply no way to properly simulate an outdoor setting indoors. Furthermore, already at the end of the first case, the nightclub, the team realized that higher-fidelity implementations of a service settings just takes too much time and effort, and the result is still not as good as planned. For this reason, it is important to carefully think when it is convenient to utilize the AOBC and when to test directly on service site. This is one of the research question to which this study tries to provide answers.

Third development round

The last development round for the space happened in October-November. Solutions were developed one at the time during the autumn 2011 when the third design case and short experimentation workshops were held.

To solve the challenge of having many prototypes being tested at the same time, the space was organized into three different test spots. Additionally, a space for building up service props and for brainstorming was dedicated close by the storage room.

Moreover, in order to prevent the teams to wasting too much time exploring materials and wondering about what prototyping techniques to best use for their case, we developed the Protobar concept. Protobar is a well-organized room where experimenter can pick up materials needed and get suggestions about how to best use them. Some signs were placed to label the materials available. Shopping lists and feedback lists were also located in the visible place in Protobar.

The challenges encountered during the development are taken into account when the final concept is presented. In the chapter 3.2.1 I summarized all the suggestions of how a prototyping space should be designed. The third analysis and testing results are taken into account in the suggestions.

Appendix 10: Prototyping exercises to facilitate service prototyping

4 Boxes – exercise for visualizing the service idea

Aim: 4 Boxes is a visualization exercise for service innovation ideas. This exercise is efficient tool for concretizing and expanding the ideas. It utilizes sketching as prototyping technique. It is done in a group of three to six people. As an input to the exercise, the group needs as many initial service innovation ideas as there are group members. It can be done for very rough ideas in the beginning of the service innovation process.

Preparations: The drawing is done on 4 Boxes exercise sheet, see Figure 56 below. At the top of the each box there is a topic for drawing. The topic should be chose based on what kind of knowledge is wanted. For instance following can be used: service activities, service experience, users and service environment. Normally the topics are chosen before hand by facilitators. As many sheets is needed as there is participants to the exercise. At the beginning, each participant places a service innovation idea as a subject of the drawing.

Running the exercise: An instruction keeps track on the time and facilitates the exercise. The drawing is done individually on one sheet at a time. Each drawing round lasts three minutes, after which there is 1-minute explanation round. In the explanation round the drawer explains their picture quickly to the next person in the group, after that sheets are changed, and a new round begins. The sheets are circulated so long that each person has been able to draw on every sheet, thus they have been involved with all the ideas.

Analyzing the results: After the drawing the group can go through all the papers and discuss on their prototypes and analyze which of them have potential and should be explored more.

Idea: _____

Concretize, stretch your idea theme by theme. Draw, use words. 3 min working + 1 minute explaining to the next one.

ENVIRONMENT	SERVICES
USERS	EXPERIENCE

Figure 56 Example 4Boxes form

Dream Theater-exercise

Aim: Dream Theater is a facilitated role-playing and acting exercise for innovation teams. Dream Theater creates first impression on how ideas work in practice. It is a good way to bring the value opportunity ideas into the practical level. It can be done basically anywhere, also in service prototyping space. As an input for the exercise an initial value opportunity idea is needed.

Preparations: Divide the participants in groups, three to six people per group. Each group should have an idea, a dream, that they are going to prototype. If the idea fits to a current industry, also corresponding current service should be thought through.

Running the exercise: First, the instructor gives a tight time limit, five to fifteen minutes, to prepare a play about the current situation, and the dream situation, which is been developed. Groups can utilize mock-ups a prepare themselves to build a quick service scene for the play. Second, after preparations each group presents their plays and the plays can be taken on video.

Analyzing the results: The audience is told to pick up the conventions of the current offering and reflect how the new offering challenges the current situation. If the play was taken on video, the group can analyze their own act afterwards.

MINDwalk-exercise

Aim: MINDwalk is a prototyping exercise that utilizes cognitive walk-through as prototyping technique. It facilitates the imagination process and creates a mental picture of the service concept. It can be used for understanding what kind of reflections design team has on certain idea. It gets the concept in practical level and produces the implementation opportunities. As an input an initial value opportunity idea, idea on who is the users and what is the need for which this value opportunity idea relates are needed. It can be utilized in the beginning of the innovation process after the idea of the service concept exists.

Preparations: The tools needed include a scarf, pen, and MINDwalk questions sheet (see Figure 57). Prepare MINDwalk question sheets, which contain description of the starting point and questions about the sequence of the service process. The description of the starting point should identify who the imaginator is; who the customer is and what their situation is.

Different pairs can have different situations. In the case 3, for instance, the MINDwalk imaginators were asked to imagine that they are going to a party in the evening and they are desperately looking for a gift, and they wouldn't want to bring any trash. They are entering to the Kamppi center and will see this new service, the immaterial gift shop.

Running the exercise: Divide the participants in pairs. Each pair decides who is the asker and who is the imaginer. Imaginer places a scarf on the eyes so that he can concentrate on the imagination. A ready-made sheet of key questions and steps with a space for notes is given to the asker. The asker guides the imaginer through the steps of the customer journey in a given timeframe, around fifteen

minutes per person. The job of the facilitator is to make imaginer to imagine concretely what happens, what can be seen and what the service environment looks like.

While the imaginer talks, the asker documents the imaginer's answer. The roles of asker and imaginer can be changed after fifteen minutes. The pair can either continue from the spot where the previous imaginer stopped all start from the beginning.

Analyzing the results: Participants point out the implementation ideas from the MINDwalk question sheet. Analysis and comparisons on the general concept should also be undertaken.

MINDwalk **M!ND** **M!ND**

www.mindspace.fi www.mindspace.fi

Awareness of need Who are you and what are you looking for?

Where and when are you when you realize your need?

Searching How do you start searching the solution for your need?

How and where do you encounter the solution first?

Searching What do you see / hear / feel?

What you makes interested?

What happens when you choose the solution? How are you supported by the service provider?

Purchasing How do you buy the service?

Receiving/installing What happens after buying?

Use How the service is provided?

How do you feel? What happens?

Storage / Customer service / Dispose What happens after the service?

What did you learn / get out from it?

Any complimentary service provided?

Figure 57 Example MINDwalk question sheet

Service mock-up building and body-storming in service prototyping space –exercise

Aim: This exercise facilitates service mock-up building and body-storming in AOBC Space. It utilizes storyboarding, service mock-up building, body-storming, and role-playing as prototyping techniques. It can be used in a workshop or within the development team to structure the prototyping activity. As an input to the exercise the team should have a topic or an idea on what they want to experiment. The exercise works better if there are two to three teams doing prototyping at the same time, because the other teams can act as test persons.

Preparations: The service prototyping space is divided in the areas depending on how many teams are prototyping at the same time. External test

persons can be acquired to come and test the prototypes if there is only one team prototyping. Prepare the prototype-analyzing sheets.

Running the exercise: Figure 58 offers an example of a timetable and shows the structure of the exercise. The exercise starts by making the hypothesis and planning the prototype. As a part of the prototype planning a quick storyboard of the service is done. It is good to concentrate on the activities that are essential for testing the hypothesis and the value expected. Timeframe for planning is ten to fifteen minutes. After planning, the team creates a mock-up of the service setup. The team can use all the materials and stuff that service prototyping space contains. A time limit is set for planning and prototyping. If there are several teams also an “own” area is given to each team.

After building the prototype is time to run the experiment. Timeframe for testing is also tight, around seven to ten minutes for testing and then five minutes for common discussion. First the roles are divided. If there is another team prototyping at the same time or external testers coming, they are performing the client’s role. The prototypers are performing the service provider’s roles and one person should take notes. If only one team is taking part, the roles are divided within the team. In testing the service is run through step by step as the prototypers have planned.

Clients can be given a short brief about the context of the service, like, “Imagine that you are in a shopping mall looking for a gift.” They are guided to act on the service how they feel during the testing, and to speak aloud. Service providers are asked to behave as they would if the service would take place in reality. They should explain only if the client asks for explanation. This allows that the clients are really testing the setup and the process and reacting to the implemented ideas, instead of being guided by the explanation and intentions.

Analyzing the results: After the testing, testers fill in the prototype-analyzing sheet. After that, the prototypers and testers can discuss the results of the questions. Prototypers should then analyze for themselves what kind of knowledge they gained and whether they validate their hypothesis.

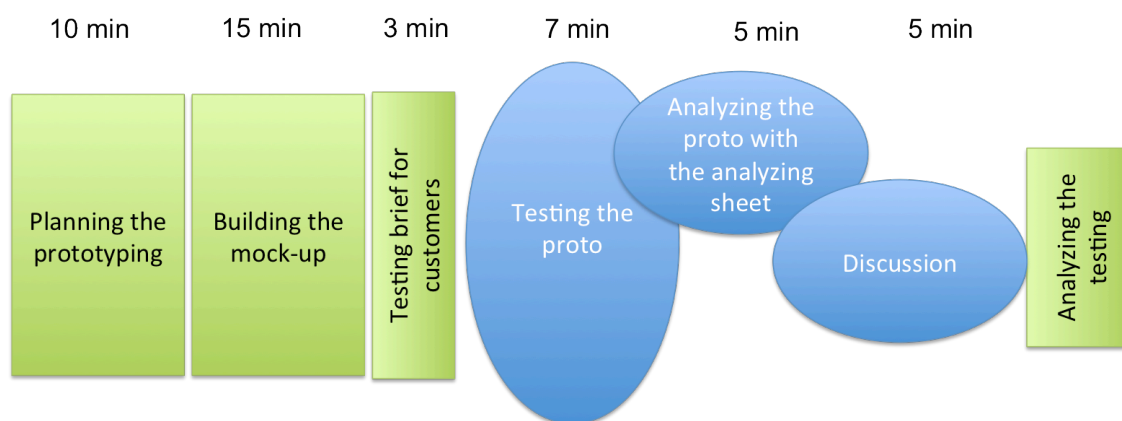


Figure 58 Example timetable for building a mock-up and body-storming session in AOBC

Appendix 11 Prototype-analyzing sheet

Name of the prototype:

Name of the analyzer:

Date & Place:

Evaluate the user experience provided by the prototype:

1) How much your idea provides an “experience”, rather than being a functional “problem-solver”?

Functionalism ←-----→ Experience

2) Does the process you prototyped feel smooth, user-friendly?

Cranky, technical, clinic ←-----→ Warm, smooth, user-friendly

3) Did the prototyped product/service seem intuitive?

Needs lots of explanations ←-----→ Intuitive

4) How engaged are the users? Do they enjoy the service provided by the prototype?

Awkward, serious ←-----→ Natural, fun

5) How environment-friendly the product/service is?

Not at all: still work to be done ←-----→ One of the core elements

6) How finished the experience provided by the prototype felt?

Still needs rounds of
rough prototyping ←-----→ Ready for implementation /
test in reality

- What didn't work? In what aspects there were problems?

- Does the prototype attract you to use or buy the product / service? What is the most attractive element at the moment? How can you maximize it?

- What elements could be designed so that the customer is even more supported in doing the buying decision?

- Were new ideas being born from the prototyping session? What improvements?