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Designing for Good User Experience with Lean Principles. The Case of Roomforit.com

Master Thesis

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Tallinn 2012

Author's Declaration

I hereby declare that thesis "Designing for Good User Experience with Lean Principles. The Case of Roomforit.com" is a result of my independent work and effort. I certify that to the best of my knowledge it does not infringe upon anyone's copyrights. Where other sources of information have been used, they have been acknowledged. This thesis has not been submitted anywhere for any other comparable academic degree.

Thesis was finished under supervision of PhD David Lamas.

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Abstract

In the saturated market of online commerce, success of a new service is tightly connected to the quality of user experience. A company cannot design positive user experience as such. Instead, one can design for certain key factors that are related to the typical usage of the service. This design process is a business challenge, as it has to be balanced with organization's own values, goals and resources. In this thesis this challenge was framed with two specific research problems. The first question was in approaches that could support designing for good user experience in an early stage project. It was assumed that a small team with limited resources could create a valuable online service concept, focusing on customer's delightful experience. The second question was whether and how Lean principles could guide this design process. These research problems were tackled in a practical project of Roomforit.com – a localized online service concept for meeting rooms booking. In this case, designing for positive user experience was challenging due to presence of two equally important user groups – renters and leasers. In this work, various possible good user experiences were inspected through a framing lens of Lean. Perceived user experience of Roomforit.com service was studied by carrying out relevant usability tests and AttrakDiff surveys as well as comparing survey feedback results in the UX matrix. Results confirmed that both groups perceived service in a positive way, which validated the success of initial service concept aims. Results showed strong evidence that applying Lean principles for design of such new online service allows achievement of good user experience. As a research outcome, an outlining of an overall concept for using Lean principles in implementation of similar service projects was proposed.

Length of this thesis is 83 pages (120 with appendicies).
The thesis contains 22 figures, 8 tables and 6 appendixes.

Keywords

User experience, UX evaluation, Lean, online service.

Kokkuvõte

Tänapäeva üleküllastunud ning konkureerivas e-kaubanduse maailmas on uue teenuse turuletulek tugevalt seotult kasutaja kogemuse kvaliteediga. Siiski on kliendile koheselt raske pakkuda positiivset kasutajakogemust, vaid pigem saab kaupmees disainida konkreetseid faktoreid mis on seotud tavapärase teenuse kasutamisega. Nimetatud disainiprotsess on omaette väljakutse äriorganisatsioonile, kuna tuleb luua tasakaal organisatsiooni väärtuste, eesmärkide ja ressursside vahel. Käesolevas magistritöös kirjeldati nimetatud väljakutset läbi kahe uurimisprobleemi. Esimene küsimus uuris millised on potensiaalsed lähenemisviisid, millega toetatakse hea kasutajakogemuse kujunemist projekti algfaasis. Sellise lähenemisviisi eelduseks oli, et isegi limiteeritud arendusressurssidega väike meeskonda suudab luua väärtusliku e-teenuse kontseptsiooni keskendudes kliendi positiivsele kogemusele. Teine probleem keskendus küsimusele, kas ja kuidas võiks kasutada Lean'i põhimõtteid disainiprotsessis. Nimetatud uurimisprobleeme käsitleti praktilise projekti Roomforit.com (lokaliseeritud e-teenuse kontseptsioon koosolekuruumide broneerimiseks) raames. Selle projekti puhul oli positiivse kasutajakogemuse disainimine raskendatud kahe võrdselt olulise kasutajagrupi, rentijate ja rendileandjate, olemasolu tõttu. Esmalt uuriti erinevaid võimalikke kasutajakogemusi kasutades Lean'i raamistiku. Saadud tagasiside põhjal viidi läbi vajalikke kasutatavuse teste ja AttrakDiff küsitlusi, mida lõpuks võrreldi kasutajakogemuse maatriksis. Tulemused kinnitasid, et mõlemad kasutajagrupid tajusid teenust positiivselt, mis omakorda valideeris teenuse kontseptsiooni algsete eesmärkide edu. Samamoodi näitasid tulemused pigem positiivset kasutajakogemust juhul, kui uue e-teenuse disainiprotsessis on kasutatud Lean'i põhimõtteid. Uuringu ühe tulemusena jõuti soovituseni kasutada Lean'i põhimõtteid edaspidiselt sarnaste teenuste ellurakendamisel.

Selle teesi pikkus on 83 lehekülge (120 lisandit).
See sisaldab 22 joonist, 6 tabelit ja 8 Lisa.

Võtmesõnad

Kasutajakogemus, kasutaja kogemuse hindamine, Lean, e-teenuse kontseptsioon.

Table of content

1 Introduction 12

1.1 Research problem and objectives 12

1.2 Research framework 12

1.3 Research methods 13

1.4 Structure of the thesis 14

2 Literature review 15

2.1 User Experience 15

2.1.1 User experience from abstract and practical perspectives 15

2.1.1.1 Abstract perspective 16

2.1.1.2 Practical perspective 17

2.1.1.3 Summary of UX notions 19

2.1.2 Designing for good UX 20

2.1.2.1 Elements of User Experience 21

2.1.2.2 Honeycomb model 22

2.1.2.3 Intended and Apparent Product Characters 22

2.1.3 UX approaches 24

2.1.4 User experience: summary 26

2.2 Lean 27

2.2.1 Toyota Production System 27

2.2.2 Lean Successors 30

2.2.2.1 Lean Production 30

2.2.2.2 Lean Thinking 30

2.2.2.3 Lean Service 32

2.2.2.4 Lean Software Development 33

2.2.3 Lean startup 35

2.2.3.1 Similar models 38

2.2.3.2 Discussion 38

2.2.4 Lean principles: summary 39

2.3 Connection between Lean and User Experience in the context of thesis project 40

3 Research 42

3.1 Project description 42

3.1.1 Idea 44

3.1.1.1 Idea 1: Linking people, resources and rentable spaces 44

3.1.1.2 Idea 2: Flexible work space booking 44

3.1.1.3 Idea 3: Meeting rooms booking 45

3.1.1.4 Idea phase: summary 46

3.1.2 Concept 47

3.1.2.1 Second hand data 48

3.1.2.2 User types 49

3.1.2.3 Mockups and Testing 50

3.1.2.4 Project planning 52

3.1.3 Demo 52

3.1.3.1 Structure 52

3.1.3.2 Identity 54

3.1.3.3 Testing 54

3.1.3.4 Live demo 55

3.1.4 Prototype 57

3.1.4.1 Towards Prototype MVP 59

3.2 Results and analysis 62

3.2.1 Structure and tools 62

3.2.2 Test biases 64

3.2.3 Results and analysis of usability test 66

3.2.4 AttrakDiff survey results and analysis 68

3.2.5 Research Evaluation with UX Match Matrix 70

3.3 Discussion 73

4 Conclusion 78

Appendices

A. 14 Toyota Way principles

B. Initial idea

C. Executive Summary

D. iRent project plan

E. Usability test and interview templates for "Renters" and "Leasers"

    E1. Template for "Renters"

    E2. Template for "Leasers"

F. Quantified AttrakDiff Single Evaluation test result data

List of Figures

Figure 1-1. Thesis framework: designing for positive user experience with Lean principles. 13

Figure 2-1. The Elements Of User Experience, simplified model. Adapted from Garrett, J. J. (2002, p. 24). User-centered Design for the Web. The Elements Of User Experience. User-centered Design for the Web (pp. 21–36). Peachpit Press. Retrieved from http://www.jjg.net/elements/pdf/elements_ch02.pdf 21

Figure 2-2. User Experience Honeycomb. Adapted from Morville, P. (2004, June 21). Retrieved from http://semanticstudios.com/publications/semantics/000029.php 22

Figure 2-3. Key elements of the model of user experience. Adapted from Hassenzahl, M. (2005, p. 32). The Thing And I: Understanding The Relationship Between User And Product. In M. A. Blythe, K. Overbeeke, A. F. M. Monk, & P. C. Wright (Eds.), Funology (pp. 31–42). New York, Boston, Dodrecht, London, Moscow: Kluwer Academic Publishers. Retrieved from http://www.cos.ufrj.br/~jano/CSCW2008/Papers/Funology Introduction.pdf 23

Figure 2-4. When to Use Which User Experience Research Methods. Adapted from: Rohrer (2008). Retrieved from: http://www.useit.com/alertbox/user-research-methods.html. 25

Figure 2-5. Build-Measure-Learn Feedback loop. Adapted from "The Lean Startup", by E. Ries, 2011, p. 81. New York, New York, USA. Crown Business. 36

Figure 3-1. Visualization of the four project phases. 43

Figure 3-2. Private research blog. Screenshot. Retrieved from http://imkethesis.wordpress.com. 43

Figure 3-3. Part of a document describing potential users. Screenshot. (Personal blog post, 10.6.2011). 50

Figure 3-4. A3 mind map of user thoughts. (Personal blog post, 2.7.2011). 50

Figure 3-5. Room profile views in Mockup version 1 and Mockup version 2. (Personal blog posts, 7.6.2011, 6.9.2011). 51

Figure 3-6. Figure X. Paper prototypes and post-it design parts for various leaser's views. (Personal blog post, 27.12.2011). 53

Figure 3-7. A screenshot from a homepage of a live demo. (2012). Retrieved from http://demo.roomforit.com. 56

Figure 3-8. Whiteboard notes from a Roomforit.com team meating. (Personal blog post, 1.9.2012). 58

Figure 3-9. Two versions of a Roomforit.com leaser's management page and its calendar view. (Personal blog post 30.9.2012, 10.10.2012). 61

Figure 3-10. A screenshot from usability test recording. (Personal communication, 21.11.2012). 64

Figure 3-11. Portfolio presentation of two AttrakDiff survey results. 69

Figure 3-12. Comparison of results from two AttrakDiff word-pair surveys. Color bars near the word pairs indicate related categories (from the top: pragmatic quality, hedoniq qualitiy – identity, hedonic quality – stimulation and attractiveness). 70

Figure 3-13. Comparison of perceived service quality values by renters and leasers. Error bars indicates standard deviation within the category. 71

Figure 3-14. Comparison of perceived service value by renters and leasers. The filled square (UX match) means both 'sellers" and 'buyers' would likely to use the service in terms of all analyzed quality and attractiveness criteria. .72

Figure 3-15. Reflection on the initial research framework: intended and actual design scope. 73

Figure 3-16. Roomforit.com project inspected through Build-Measure-Learn spiral. 75

List of Tables

Table 2-1. Overview of the most common UX interpretations. 19

Table 2-2. An overview of methods suitable for online service conceptualization and optimization phases. 26

Table 3-1. Summary of business research methods, intended UX values and strategic changes. 46

Table 3-2. Summary of research and design methods and approaches during concept phase. Dates in the table refer to posts in project's blog (personal communication). 48

Table 3-3. Summary of methods and approaches in Concept phase. Dates in the table refer to posts in the private research blog (personal communication). 57

Table 3-4. Project evaluation with renters and leasers. Meeting structure, content and used tools. 63

Table 3-5. Renters' usability test summary. 66

Table 3-6. Leasers' usability test summary. 67

Abbreviations

HCD	Human-centered design
MVP	Minimum Viable Product
UX	User Experience
TPS	Toyota Production System

1 Introduction

It is difficult to build a valuable online service concept in the highly competitive and extremely uncertain field of IT-startups (Ries, 2012). In a densely populated market of similar online applications and services, well-executed design is still valued but simply offering a functioning product is no longer enough. For the service to be profitable and sustainable, user's expectations have to be carefully studied. Quality of user experience (UX) is thus becoming an even more critical business factor (e.g. Ramsey, 2012; Bryan, 2012).

Organization's values and resources steer the design process, which makes creating a delightful online product a business challenge. The new paradigm question is formulated: is there a way for organizations to design for positive user experience?

1.1 Research problem and objectives

This thesis explores the idea of achievement of a "good user experience" in the context of a practical project – an online web service concept. In terms of this work, a concept refers to a snapshot of design process between experiencing with new business ideas and designing emulative service prototype. The work is started with two assumptions:

1. When designing for good user experience, even a small team with limited resources could create a valuable online service concept.
2. Design process of such potentially valuable concept could benefit from Lean principles. Lean focuses on efficient value-creation and iterative learning.

Based on these assumptions, following research problems are formulated:

1. What approaches could be used to support designing for good user experience in the context of thesis project?
2. How can Lean principles guide design process of this project?

1.2 Research framework

Practical development of a commercial online application is a multidisciplinary project. This thesis concentrates on approaches aimed for supporting positive UX within guiding Lean framework (Figure 1-1). Service design itself, project management, communications, marketing, software

development and graphic interface design are left outside the presented knowledge base, although topics related to research questions are briefly discussed in Results chapter.

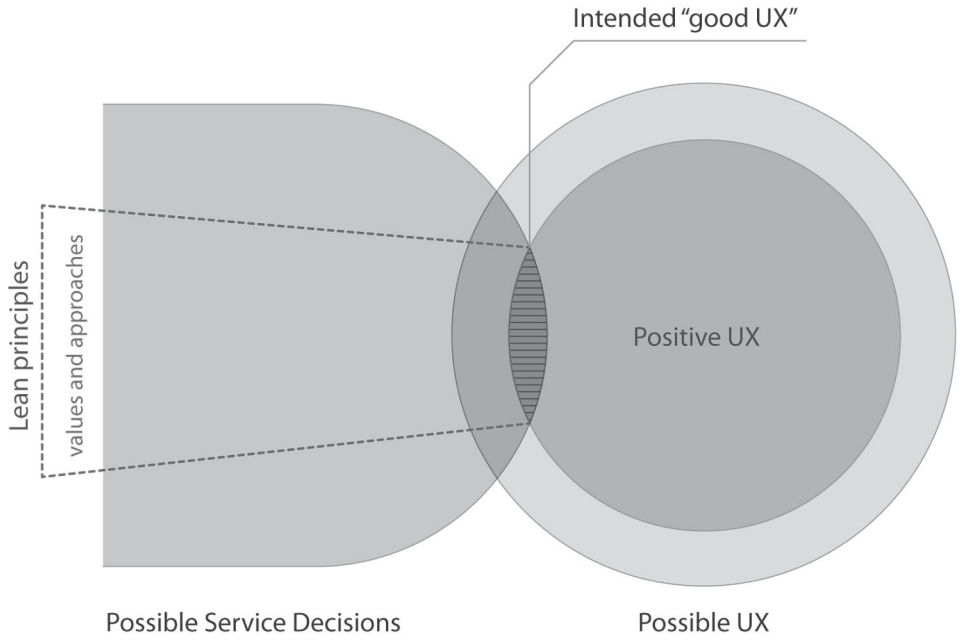

Figure 1-1. Thesis framework: designing for positive user experience with Lean principles.

1.3 Research methods

This thesis can be described as a design research. Design research, as opposite to e.g researching design, emphasizes on innovativeness in specific domain context (Hevner and Chatterjee, 2010, 15). Hevner and Chatterjee (2010, 5) described design science research as a paradigm, in which "designer answers questions related to human problems via the creation of innovative artifacts, thereby contributing new knowledge to the body of scientific evidence".

Design research is carried out through creating a commercial online service concept. Good user experience is put as a core value of project's design process. The success measure is evaluated with results from usability studies and AttrakDiff surveys. Research questions are studied through critical evaluation of the approaches used during this design process.

The contribution of this research to domain knowledge is in outlining of an overall concept for using Lean principles in implementation of similar online service projects.

1.4 Structure of the thesis

This master thesis is structured into the following sections:

Literature review concentrates on the notions of user experience and Lean design as well as approaches, values and principles related to the early stages of business concept formation.

First chapter takes a look on fuzzy notion of "user experience" (UX). It could be argued that despite the scattered opinions on what user experience is, designing for UX from the very beginning can help to develop a more valuable online service concept. Literature review outlines some approaches suitable for service concept planning and early stage prototyping.

Lean design chapter introduces origins and metamorphosis of Lean ideology, beginning with Toyota Production System (TPS) and its transformation to Lean production and Lean thinking. Brief historical overview is followed by contemporary application of Lean to services, Agile and startups. Notions such as discovery driven approach of business models and Minimum Viable Product (MPV) are explored. At the end of the chapter a connection between user experience and more abstract principles of Lean ideology is suggested.

Research chapter describes Roomforit.com project through four chronological phases: idea, concept, demo and prototype. Each stage is studied from the perspective of two formulated research problems: specific attention is given to discoveries regarding usability and user experience as well as pivoting decisions regarding the overall direction of the concept and molding of MVP. Such attention is expressed by e.g. introducing various research approaches used along the way as well as findings derived from the research. In Results and analysis usability test and AttrakDiff survey results are addressed. Research chapter is finalized with a reflection on selected UX approaches and the role of Lean in Roomforit.com project.

Conclusion chapter summarizes main points of the research.

Appendices include background and supporting information on Lean principles (A), initial idea (B), its executive summary (C), the project plan (D), developed usability test and interview templates (E), AttrakDiff Single Evaluation test results (F), and quantified AttrakDiff Single Evaluation test result data (G).

2 Literature review

2.1 User Experience

Designing for user experience (UX) presents a challenge since there seems to be lack of a common and clear understanding of what UX is in the first place. Nonetheless, the numerous interpretations of user experience show that this topic has gained attention in scientific research. Divergence can be witnessed for instance in the collection of user experience definitions in Roto's (et al. 2012) blog "All About UX": including feedback from peers, just in a single post almost thirty varying definitions were collected (e.g. ISO 9241-210; Nielsen-Norman Group; Hassenzahl & Tractinsky, 2006; Sward & MacArthur, 2007). This bewilderment was also noted by e.g. Bevan (2008, p. 1), who saw that "the current interpretations of UX are even more diverse than those of usability".

In the context of UX, ISO 9241-210 standard is regularly quoted. It is a "Human-centered design for interactive systems" standard that propose focus on users and their needs in design process, developing the design iteratively and collecting user-specific factors for design assessment (Jokela, 2011; Roto et al. 2009; Wikipedia, 2012a). This standard summarized user experience as a "person's perceptions and responses that result from the use or anticipated use of a product, system or service". Jokela (2011) argued that although such determination is sound, interpretation's first note was semantically problematic, since it saw user experience as both subjective – i.e. "feelings" and "beliefs" – and objective – "accomplishments".

Committee draft ISO CD 9241-210 states that UX is "all aspects of the user's experience when interacting with the product, service, environment or facility". This interpretation is more holistic than the previous one, but could also be criticized. Hassenzahl (2008) argued that "all aspects" is a rather broad and vague term since it could be understood as "everything".

While one can easily see the connection of HCD and designing for good user experience, UX factors such as aesthetic and social requirements are essentially much broader and, due to their personal and dynamic nature, much harder to encode. (Roto, Law, Vermeeren & Hoonhout, 2011).

2.1.1 User experience from abstract and practical perspectives

In order to understand better what user experience means, domain terminology can be observed from three different levels. Abstract view examines UX as a phenomenom and asks what it is or is

not. In the UX field of study, means of experiences are explored: the main question is what actually enables a certain user experience. On the practical level solutions for certain user experiences are researched. In the next chapters, abstract and practical views are inspected in more detail.

2.1.1.1 Abstract perspective

Roto, Law, Vermeeren and Hoonhout (2011, p. 6) combined ideas of several UX experts in their "White paper". From their perspective, user experience is related to active and passive encounter with a system. The additional word user is supplied in order to make a difference to a general or "any kind of" experience. This thought is inline with those by Jetter and Gerken (2010), Hassenzahl and Tractinsky (2006) and as well as Nielsen, Norman and Tognazzini (2011), though their interpretations were varying in details such as effect of a context on formulation of UX and factors that are related to the incorporation of total user experience.

Hassenzahl and Tractinsky (2006, p. 95) discussed that UX is a consequence of characteristics of a system, user's internal state and the context of use. As examples of elements that affect the formation of UX, these writers mentioned among others user's needs, motivation and mood, product's complexity and purpose as well as social settings and meaningfulness of the activity.

Jetter and Gerken (2010, 1-2) were slightly more flexible regarding how total user experience is combined. They saw that in addition to traditional qualities like reliability and usability, wholesome user experience is created through incorporation of various new concepts from psychology, design and marketing. User might evaluate a service or a product for instance on a sketchy scale of fun, "cool", "sexy" and so on.

Norman, Miller and Henderson (1995) could be seen as one of the firsts experts to introduce and formulate the idea of UX. Recently updated interpretation by Nielsen, Norman and Tognazzini (2011) proposed even broader but also more vernacular interpretation of user experience. Authors saw that user experiences "encompasses all aspects of the end-user's interaction with the company, its services, and its products". Authors highlighted that organization has to strive to do more than just fulfill exact customer needs or complete certain checklist features. Their suggestion is that in order to create a good product or service, multidisciplinary efforts are required: in other words, a seamless collaboration from marketing, graphic and interaction design, development etc.

2.1.1.2 Practical perspective

Practical perspective looks on solutions for specific user experiences. In the context of this thesis, focus is set especially on aspects related to a concept phase of a project.

Roto, Law, Vermeeren & Hoonhout (2011) have noted that user experience cannot be designed directly, since every experience is dynamic and unique to each person, social context and cultural background. Usability and interface design are part of the aspects of user experience but these terms are not synonyms. This also applies to broader customer and brand experience: they are not the same but user experience affects them and other way around.

The dynamic nature of user experience is a curious notion. Roto, Law, Vermeeren & Hoonhout (2011, p. 8) suggested that there are two extreme ends. On one end is a momentary UX, which reflects upon feelings during usage of the service – e.g. "the first impression". On the other end is a cumulative UX that emerges over time, after several periods of use. Episodic, reflective user experiences occur after specific usages. Understanding that user experience is more than a standalone feeling at a certain moment is important for the thesis project – it hints that what user might say or feel during usability testing is not necessary the whole static "truth"; missing this point might result in lack of correct understanding regarding what is really valued by users.

Hassenzahl (2008) pointed out that while usability tests and user interviews might reveal that product is perceived for example as "original" at the time of use, it might not imply that user will like it to be so – thus there might occur a gap between what designer intended and what user felt and wanted. Hassenzahl and Tractinsky (2006, p. 95) also noted that designing specific emotions is likely not possible but what one can do, is to establish a context for them. A political online discussion board might be intended to support excitement and having high positive arousal. Same goals will less likely suit an online bank application – unless users will specifically express that this is what they are missing.

Jetter and Gerken (2010, p. 1) wrote that in experience economy, usability is not a sole reason for people to buy products or services. For example, in addition to enjoying an easy "WYSIWYG" editor, a "business-mom" subscribing to a blog portal might want to feel independent and competent – keeping her own blog might release her from her primary concern; constantly calling her sarcastic teen son for technical help. Or perhaps her main goal is to become recognized for her extraordinary cooking skills. Scripted usability test could reveal how well she can accomplish a task of writing a blog post but not necessary whether she would like to do it and why.

Jetter and Gerken (2010, p. 3) stressed that this type of user experiences are individual. Serving every possible need and feeling is impractical. In order for a service to even begin its operation, an organization should create a design frame (a context) accordingly to company's values and business model. Intended user experience can then be placed in a central role of this specific context and design process. In a reflection to the previous example, blog service providers would be facing hard times if they decided to create thematic templates for all possible blog post ideas. Instead, closer inspection of the context of use could be carried out. As a conclusion, blog service provider might support users with e.g. tools for writing in different situations such as on the go or simultaneously with someone else. The connection between such solutions and underlying goals should be a result of research, design and testing.

Kuniavsky (2003, p. 60–69) reflected on UX from three design aspects: information architecture, interaction design and identity design – all of which are combined in the role of user experience researcher. These distinctions can help identify what research approaches could be taken in account at different phases of thesis project:

- **Information architects** look for insights of who are service's users and what type of mental models they have about information – structure, prioritization, semantics, etc. Typical research techniques involve task analysis, card sorting and diary analysis; results are used for e.g. determining features and for marketing purposes.
- **Interaction designers** control immediate user experience, thus they are interested in more narrow information regarding UX. Questions such as will users achieve things they want to do, are related to interaction designer's work. For instance task-based usability testing can be used for research – it indicates well how certain tasks are accomplished as well as reveals possible bottlenecks and flaws in design. Usability testing however does not reveal what people want and why.
- **Identity design** is part of service's brand: it communicates organization's values, visual style, tone, vibe, editorial voice, evoked associations and many other aspects of the whole service. Identity designer's role is to make online service experience enjoyable, unique and memorable. This differs from marketer's goals, which might be for instance convincing people to visit the site or to subscribe to premium model. Identity designer is looking for details regarding people's immediate emotional responses, memories and evocations, direction of their attention as well as their references and associations. Research can be done with e.g. interviews and competitive analysis. Latter could for instance include

research of competitor's service features and testing which of them would be the most valuable for the users.

2.1.1.3 Summary of UX notions

Table 2-2 summarizes few main details of user experience notions previously presented.

Table 2-1. Overview of the most common UX interpretations.

Reference	**Abstract approach**	**Practical approach**
ISO 9241-210	Person's perceptions and responses that result from the use or anticipated use of a product, system or service.	–
Roto, Law, Vermeeren & Hoonhout (2011, p. 6)	Active and passive encounter with a system.	UX is dynamic and might change over time. It cannot be designed directly. Usability and interface design are part of the experience.
Hassenzahl and Tractinsky (2006, p. 95)	Consequence of characteristics of a system, user's internal state and context.	Designers might not have ability to design particular emotions but they might settle for establishing a context for them.
Jetter and Gerken (2010, p. 1-2)	Wholesome user experience is created through incorporation of various new concepts from psychology, design and marketing.	Instead focusing solely on the user, organization should create a framework based on company's values and business model and then place user's subjective values in the central role.
Nielsen, Norman and Tognazzini (2011)	UX encompasses all aspects of the end-user's interaction with the company, its services, and its products.	–
Kuniavsky (2003, p. 60-69)	–	UX can be studied from the point of view of information design (i.e. discovering mental models and semantics), interaction design (usability) and identity design (associations, evocation, service value). All of these are combined in user experience research.

One can see that despite the fuzziness in terminology, there are in fact many points of agreement. Most authors accept that user experience emerges when passively or actively interacting with the system or service. There is also a common understanding that UX is dynamic and can change over time. Most experts agree that designing for certain user experience requires a multidisciplinary approach and that the usability is one of the aspects, which affects on what user feels and thinks. Some authors also suggested that in order to approach UX question from practical perspective a context based on e.g. company's business model could be formed.

Jetter and Gerken (2010) and Norman (2011) suggested that designing for UX is not a standalone task of interaction designer or marketer. Jetter and Gerken (2010, p. 5) referred to a view by

Karen Donoghue: "A successful user experience creates an elegant equilibrium between delivering value for customers and value for the firm." This suggests that building for good user experience should be seen as a vision correlated with the business interests of the organization. This aspect is studied in this thesis from Lean principles' perspective, described in chapter 2.3.

Another aspect of thesis' research problem is designing for 'good' user experience in the context of online service concept. It should be noted that in literature such goal might be occasionally referred to as UXD, user experience design. However this work refrains from applying this term. Fredheim (2011) argued that because of the blurry UX notion and the buzz surrounding the concept, designers tend to misuse it. UX might then become a synonym for usability design, information architecture or just something that designer is doing with good intentions. All of these are important factors and influencers on user experience but what they do not directly express is each user's individual experience – something that is subjective and dynamic. Fredheim (2011) suggested that due to complexity of formulation of each user experience, it cannot be designed in principle. However – one can aim to design for it.

Most interpretations did not express specific factors that would generally resolve in good UX, while importance of practical contextual research was noted (i.e. Kuniavsky, 2003). In order to understand how this could be done, two guiding questions are set in this work:

- What could lead to good user experience?
- What methods and principles can be used for practical user experience research in the context of thesis project?

2.1.2 Designing for good UX

Roto, Law, Vermeeren and Hoonhout (2011) approached the question of UX by ruling out what is it not. This is much harder to do regarding "good" user experience: even bad usability and horrible web graphics might not necessary result in cumulatively bad UX, for example when the content value is much dominant. For instance a web service "Geocities-izer" (Lacher, 2012) broke almost every usability rule imaginable but was a popular meme. Service idea was rather straightforward – user submits a URL address and sees a view of this page with Geocities -styled graphics, which resemble web style of the late 1990's: blinking GIF-animations, huge images, Comic Sans -font etc.

Another approach to withdrawn what might be good UX is to look on general user experience "facets". For this thesis, three models by Garett, Morville and Hassenzahl are briefly discussed.

Garett's model (2002) introduces levels on which UX can be studied, Morville's model (2004) presents UX semantics for discussion and Hassenzahl's more complex approach (2005) points out gap between what designer intended and what user felt.

2.1.2.1 Elements of User Experience

Garett (2002) visualized UX elements as planes (Figure 2-1). The purpose of the model was to describe key considerations related to "development of user experience" – expression that might be criticized based on Fredheim's (2011) suggestion. Strategy determines user's needs and service objectives, scope – various functional specifications and content requirements. Structure refers to interaction design and information architecture, such as action flows. Skeleton plane incorporates various interface design elements and surface – graphic treatment of interface design.

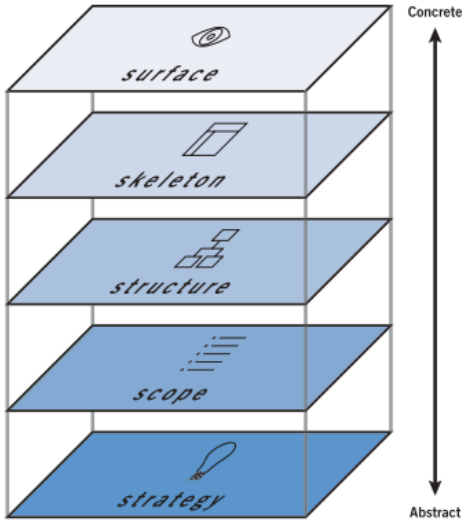

Figure 2-1. The Elements Of User Experience, simplified model. Adapted from Garrett, J. J. (2002, p. 24). User-centered Design for the Web. The Elements Of User Experience. User-centered Design for the Web (pp. 21–36). Peachpit Press. Retrieved from http://www.jjg.net/elements/pdf/elements_ch02.pdf

The model does not answer what UX attributes one should consider, rather it gives a perspective of what question one might ask at various project stages. Model's considerations are also related to fragmentation of choices that one is facing when moving from abstract strategy on to detailed, top level interface design: choices made on one plane will affect possibilities on the next plane.

Garrett (2002) argued that his model was not complete since it did not describe the development process or UX team roles. Dalton (2007) suggested that because of overlapping position of planes, their interconnection was missing. He also proposed to widen strategy plane and add business goals and user experience as strategic factors guiding any design related question.

2.1.2.2 Honeycomb model

Morville's (2004) honeycomb diagram introduces seven facets of "good" user experience (Figure 2-2) and it is intended to be more of a conversation starter than a checklist. The central facet value refers to organization's need of delivering customer satisfaction – thesis studies this aspect through Lean principles described in chapter 2.3. Some of the facets (usable, findable, accessible) can be reflected to Nielsen's (2005) heuristics and studied from usability's aspect. Desirable-facet is linked to identity design (i.e. Kuniavsky 2003). Morville (2004) connected credible-faced to Stanford Web Credibility Research. Credible-facet could also be associated with e.g. Bevan (2008, p.2) quality-in-use pin point "safety". Last facet might be especially important for example to services that deal with money transactions or require users to provide private information for registration.

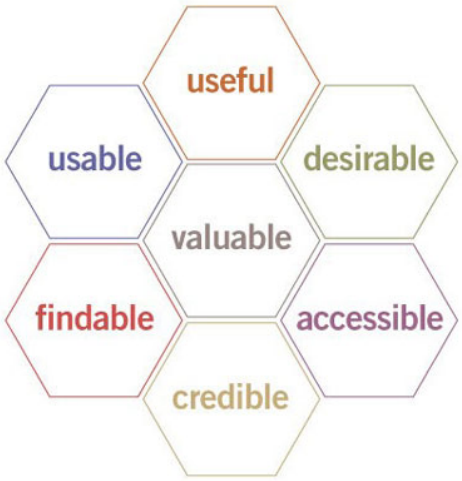

Figure 2-2. User Experience Honeycomb. Adapted from Morville, P. (2004, June 21). Retrieved from http://semanticstudios.com/publications/semantics/000029.php

2.1.2.3 Intended and Apparent Product Characters

Two previous models express levels on which UX can be studied and semantic attributes which can be inspected. Hassenzahl's (2005, p. 34) model (Figure 2-3) studied behavior consequences – processes that help to understand how specific intended product character made by the designer differ from user's personal views on apparent product character in various situations. Intended product character is fabricated with all various aspects related to web service design such as content, style and identity. User's assessment might depend for instance on the situation at hand, expectations, mood and motivation (Hassenzahl and Tractinsky, 2006, p. 95).

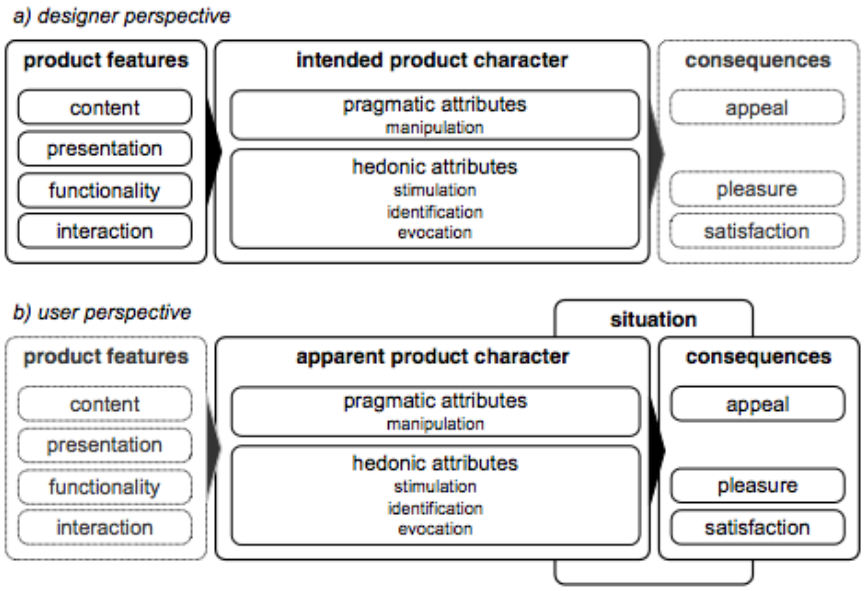

Figure 2-3. Key elements of the model of user experience. Adapted from Hassenzahl, M. (2005, p. 32). The Thing And I: Understanding The Relationship Between User And Product. In M. A. Blythe, K. Overbeeke, A. F. M. Monk, & P. C. Wright (Eds.), Funology (pp. 31–42). New York, Boston, Dodrecht, London, Moscow: Kluwer Academic Publishers. Retrieved from http://www.cos.ufrj.br/~jano/CSCW2008/Papers/Funology Introduction.pdf

Based on interaction, user sets a judgement regarding service appeal – or more simply put, is it good or bad – which is followed by emotional and behavior consequences. Positive emotional consequences are related to pleasure and satisfaction. Good behavior consequences might result for instance in sharing own experience with others. Hassenzahl (2005, p. 34) pointed out that user will always experience something when interacting with the service.

Hassenzahl (2008; 2005, p. 35) divided various user needs associated with apparent product character into two groups:

- **Pragmatic quality and user's do-goals**

  Do-goals are service's perceived ability to achieve user's intentions. Such do-goals might be for example as simple as "log in" or "order shoes from online store". Pragmatic attributes could be for instance "useful" and "findable". Completion of the task fulfills the goal. Good usability can improve user's perception of how well this task could be completed.

- **Hedonic quality and user's be-goals**

  Be-goals refer to service's perceived ability to support achievements. Be-goals are more vague and self-centric human needs – they might be related for instance to being special or being more related to others. Measurement of such underlying needs has to be based on a model that establishes a clear link between perception and the service. For example

online bank might want to design for intended attributes such as 'clear' and 'trustworthy' in order to make user feel competent and safe.

According to Hassenzahl (2005, p. 35) hedonic function of a service can provide stimulation, identification and evocation. First strives to support personal development – an interesting aspect for so called "future power users". For instance features that user adopted already might be perceived pragmatic, features not used but only noted – as a stimulation for further development, even if such development never occurs in practice. Identification is related to communicating user's identity. Blogs, social media and photo sharing services support this attribute greatly. Evocation refers to provoking memories – relationships, past events and other thoughts important to individuals.

Hassenzahl's approach (2008; 2005) revealed the complexity of designing for UX. The same user might perceive even a same feature differently. For example social network Facebook (2012) provided opportunity to open fan pages. When the page is created, a guiding tour of tools and statistics is done with alert boxes appearing in sequence. This introduction cannot be skipped. It is pleasant when page is created for the first time and extremely frustrating when user creates his third, fourth and so on. Such annoyance could be easily fixed there with a simple "dismiss forever" option.

2.1.3 UX approaches

Based on the literature review, several methods can be proposed for practical project in this thesis. As learned, selection of the right method depends on the level of decision-making, scope of interest and time frame of reflection. For instance Roto et al. (2012) have collected over 80 methods for designing for UX, which were categorized – among others – by type, development phase, information provider and the length of period when user experience is studied. It is clear that all aspects of service cannot be tested in the framework of this thesis project; it is even arguable whether one should do so in any other practical case. Rohner (2008) noted that there is indeed no point to use all possible methods – rather one should select methods based on the questions they are aimed to answer.

Rohner (2008) mapped some common methods on three dimensions (Figure 2-4): data source, approach and context of product use with a reflection on product's phase. Data source refers to qualitative (why, how) and quantitative (how many, how much) studies. Context describes usage of a product, which can be natural or near natural, scripted, refrained or hybrid of the previous.

Rohrer (2008) devided product phases to three stages: strategize, optimize and assess. At the concept stage of creating a strategy, new ideas and opportunities are explored – suitable methods vary greatly. Optimization phase aims to reduce risk and improve usability through formative methods. Summative assessment can be done when enough user data is available – suitable methods are e.g. surveys and online assessment with tools such as AttrakDiff.

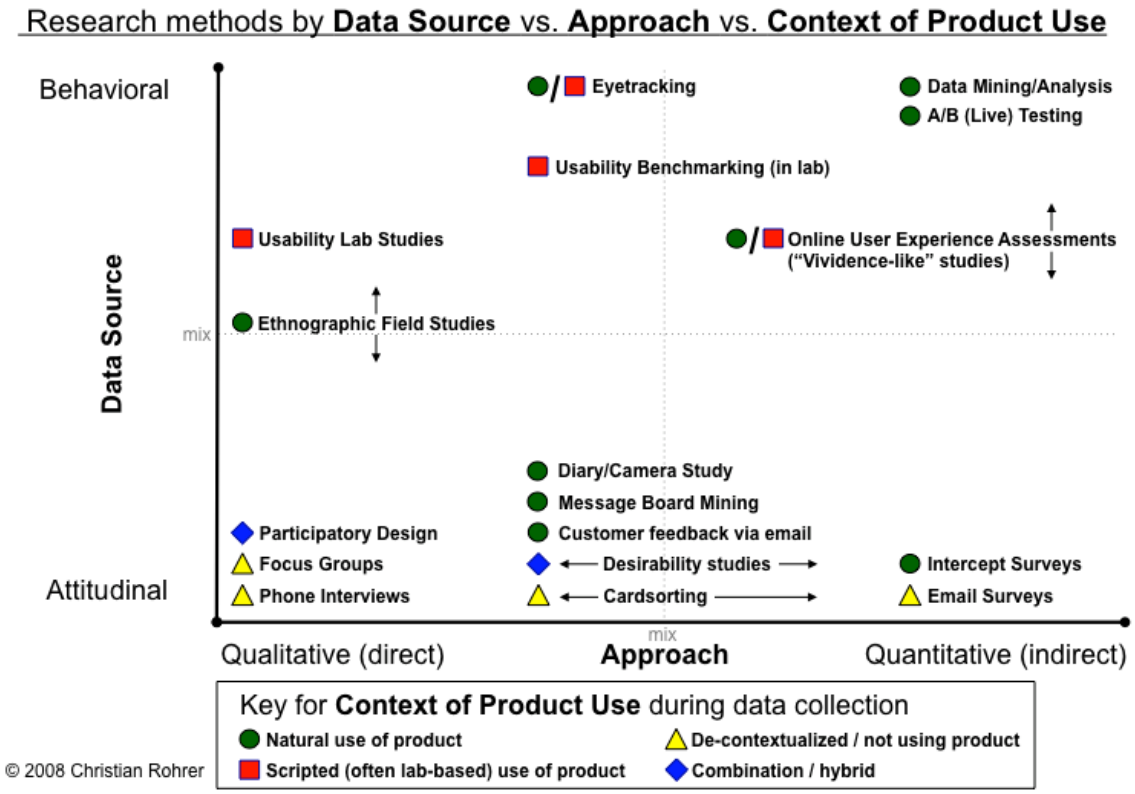

Figure 2-4. When to Use Which User Experience Research Methods. Adapted from: Rohrer (2008). Retrieved from: http://www.useit.com/alertbox/user-research-methods.html.

Some of the suitable methods are listed in Table 2-2 (adapted from e.g. Rohrer, 2008; Roto et. al, 2012). This is a rough collection and is intended to work as a guideline for selecting suitable methods at the conceptualization (in Research chapter: idea and concept) and optimization (demo, prototype) phases of the project. As Rohrer (2008) noted, some methods can satisfy multiple goals - thus they might be used at both, conceptualization and optimization phases.

Table 2-2. An overview of methods suitable for online service conceptualization and optimization phases.

	Strategy	Optimization
Goal	Inspiration, exploring new ideas and opportunities	Design optimization, reducing risk, improving usability
Method	Qualitative and quantitative	Mainly qualitative and formative
Approach	Semi-structured experience interview, face-to-face or online meetings (e.g. Mason, 2002)	Usability studies; "Think aloud" protocol (Krug 2010, p. 13, 63)
	Exploration test – ethnographic test for evaluating user's perception (e.g. Kuniavsky, 2003)	Personas, scenarios, in-team discussion (Goodwin, 2009, p. 651)
	Surveys (Rohrer, 2008)	Mood-boards, sketches, storyboards (Roto et al., 2012)
	Competitive analysis (Kuniavsky, 2003)	"Innovative UX evaluation methods" during design process (Goodwin, 2009, p. 59)
		AttrakDiff - summative questionnaire (AttrakDiff, 2012)

Adapted from: Rohrer, C. (2008, October 10). When to Use Which User Experience Research Methods. Retrieved from: http://www.useit.com/alertbox/user-research-methods.html.

2.1.4 User experience: summary

What could be withdrawn from Jetter and Gerken (2010), Hassenzahl (2008) and others is that there is no magic trick for designing an ultimately good user experience but there are some underlying principles that could guide the design process. It is likely that a service could not provide everything to everyone but it might provide good settings to support most important user experience factors, e.g. Roto et al. (2009) summarized: "It is usual that a design team will only be able to deal with a few critical UX factors that influence the suitability of the design for a typical usage situation."

Although surprises and insights associated with user's interaction with a particular service are difficult to predict and quantify, they have a significant implicit effect on the overall value and quality of the perceived association of the service. Since such effects are difficult to quantify a priori, especially at the early stages of the project, no standardized or "best practice" methods of their assessment could be established and implemented. Nevertheless the importance and sometimes a critical effect of such surprises should not be underestimated. In this context some approaches should be foreseen in order to account possible impact of various user experience factors.

2.2 Lean

2.2.1 Toyota Production System

The predecessor of contemporary start-up oriented Lean (or lean) ideology has said to have origins in Toyota's Production Systems (TPS), also sometime confusingly referred to as Lean manufacturing and Lean production (Lean terms might also be spelled in lowercase). Simply outlined, it is an efficiency approach and a management philosophy of creating better customer value with good quality but lesser resources. Value is an action or process that client is ready to pay for. Lean manufacturing was a retrospective name for philosophy developed and applied to management of Japanese car producer Toyota's manufacturing process after 1930's. This philosophy was aimed to simplify car production without decreasing quality and to broaden the variety of offerings in order to meet customer's wishes. (Lean Enterprise Institute, 2012).

In the late 1920's, regardless carefully through-out manufacturing flow and earlier success in the market of affordable cars for middle class, Toyota's competitor Ford was losing market share. At those times, company was limited to only one car, Model T, whereas customers started to express demand for more options. Despite new advanced technology and spotting opportunity early, other car producers were said to be unable to answer this demand throughput times, lags between process steps and costs were still cumulatively growing. (Ford, 2012; Lean Enterprise Institute, 2012).

Toyota's leaders Kiichiro Toyoda, Taiichi Ohno and others shifted focus from operation of single units to overall process: tailored machines for actual volume and quick production, improved quality through self-monitoring machinery, reordered machines in the sequence of the true process and amended information management. These relatively small changes – learned and adopted over period of time – were targeted to create a strong competitive advantage: obtaining low costs while being able to quickly manufacture products that customers wanted, with quality and variety. (Ford, 2012; Lean Enterprise Institute, 2012).

Over the years these ideas were combined in Toyota's Production System, TPS. In broader terms, ideology was objected to create a Just-in-time –production flow (JIT) by a process of designing out overburden (muri in Japanese) and inconsistency (mura) as well as removing waste (muda) – actions and elements that did not create any value to clients and company. (Lean Enterprise Institute, 2012; Basu & Walton, 2011, p. 11).

Ohno (1998, in Basu & Walton, 2011, pp. 11) determined seven types of waste: overproduction, waiting, transportation, over-processing, excess inventory, movement and defectives. In manufacturing, overproduction is seen as a biggest squandering. The process of removing waste was supported by continues improvement cycle know as kaizen. (Lean Enterprise Institute, 2012; Basu & Walton, 2011, p. 11).

> One of the practical examples of Toyota's Production System was applied by Taiichi Ohno in the early 1950's. In manufacturing, changing forming presses dies – devices needed for production of vehicle parts – used to take up to a day and required a specialist. Through studying the workflow of production workers and experimenting with used presses, Ohno made few pivotal discoveries. By tweaking old machines, Toyota's engineers were able to simplify die technology. Ohno noticed that workers who were doing other tasks had spare time and could be trained to change these dies easily. To his surprise, he also realized that it is more cost-effective to make parts in smaller batches: this for instance reduced amount of stamping mistakes. (Womack et al., 1990, p. 55–56).
>
> In order to make this approach durable, Ohno has paid close attention to the motivation and actions of the workers. At Ford's and many other shops, assembly workers were seen as merely extension of machines; even though production mistakes were multiplying at each line stage, only senior managers had the right – but usually no will, since their work success was measured in produced units – to stop the line and study the mistake. Ohno saw this as wasted human resources and suggested that workers could operate in local teams and have the right to stop the line if they spotted a mistake. (Womack et al., 1990, p. 56–57)

Ohno's objectives was not to increase the amount of stops – which inevitable happened but to eventually reduce them to zero, as every stop was closely analyzed and work teams learned more and more about general, repeated problems. The analysis or root cause were done with problem solving methodologies including genshi genbutsu – "go and see", cause-effect diagrams, also known as Ishikawa's fishbone as well as Sachiki Toyoda's "5 why's". The idea of so called zero quality control was later derived by Toyota's engineer Shigeo Shingo to one of the core concepts of Lean manufacturing, poka-yoke, which stands for mistake-proofing in fundamental business areas. Practical examples of mistake proofing are for instance visual control devices and color-coded cables (Womack et al., 1990, p. 56–57; Basu & Walton, 2011, p. 92).

Basu and Walton (2011, pp. 92) mention that mistake proofing might be grounded in basic common sense. As a critique, it could be then said that any problem in business and service can

be solved efficiently with careful attention to details and correction of mistakes – perhaps even another way to express folk wisdom of thrifts? In addition, concentrating on mistake-proofing and reducing defects may result as plain workaround for a job that should not have been done in the first place. One might create a system for color-coding tools, instead of in-depth training on how to use them, or why not, developing a stylish notification system for online service, instead of hiring a customer assistant. However, there is a chance that in the end these cables will not be needed and notification will be simply ignored. Since time might be wasted in vain, these workarounds that do not solve real root problems might consequentially pile up and endanger the whole business.

Liker (2004) acknowledged this problem and pointed out that color-coded cables and other similar practical examples of Toyota Production System (or "Toyota Way", another name given in 2001) are merely bits and pieces of a long-term cultural implementation requiring training, continued improvement and commitment.

Liker (2004) thought that with Toyota's approach, company's dependence on tools was much less significant than on people, since everyone was included and involved in continuous problem solving. Interestingly, these management and human resource challenges were in reality approached with rather hands-on solutions. For instance, teamwork was facilitated with methods like brainstorming, training, "nemawashi" and "5s". Nemawashi refers to consensus, derived from discussion with those who are close to the problem. Five S stands for sorting tools, setting work place in order, shine – keeping everything clean, standardizing operations and sustaining established good practices.

Basu and Walton (2011, p. 110) summarized the thought: "It is useful to note that quality gurus of Japan like numbered lists, e.g. the seven mudas, the five whys, the five Ss. However, the exact number of Ss is less important than observing the simple doctrine of achieving the elimination of waste."

In executive summary, Liker (2004) listed 14 Toyota Way principles, derived from the original TPS (Appendix A). These included for instance number 5 – "Build a culture for stopping to fix problems, to get quality right in the first time", number 12 – "genchi genbutsu" or simply, "go and see" as well as number 14 – "Become a learning organization through relentless reflection (hansei) and continuous improvement (kaizen)".

Liker (2004) stressed that using some of the tools such as 5s or some of the Toyota way principles do not automatically guarantee a success. He also saw that such common ideology could be

adopted outside car manufacturing industry. Liker (2004) thought that the key point was that for an organization developing and obtaining its own principles, TPS could be a good starting point.

2.2.2 Lean Successors

2.2.2.1 Lean Production

Toyota's Production System was adopted, refined and generalized by other industries and outside Japan. The term Lean production (a U.S counterpart for TPS) was introduced by researcher John Krafcik in the late 1980's. Krafcik used the word lean as a synonym for less, referring to idea of reducing unnecessary elements such as manufacturing space, investment in unneeded tools and redundant developing hours. Seddon and O'Donovan (2009) saw that the new term 'Lean' begun the codification of the method. (Graban, 2010).

Wocmack, Jones and Roos. (1990, p. 10–11) saw that one of the most noticeable differences between mass production and Lean production was underlying goals: where mass production seemed to be satisfied with sufficient quality and "good enough" products, Lean aimed to engineer an almost impossible perfection by redesigning out waste and broaden variety. (Womack, Jones & Roos, 1990, p. 10).

Six Sigma was a term for another management strategy developed by Motorola and General Electrics in the mid-1980's. In addition to set of quality management methods, it aimed to numerically validate development process. Sigma refers to a mathematical sign , a measure of variation from the mean, which, in the context of Lean production, was used to describe level of defects. The greater the value of sigma, the less defects. Six sigma level was thus pointing to a high performance. (Basu & Walton, 2011, p. 4).

The Six Sigma approach by its critics, especially at hype peak in the late 1990's, was seen as "statistical process control in new clothing" and another "management fad" that made workers collect data instead of working. Despite criticism, in the recent years new deviations of Six Sigma has evolved, including Lean Processes and FIT SIGMA (Basu & Walton, 2011, p. 14).

2.2.2.2 Lean Thinking

Lean thinking was a summarization of previous Lean production ideas with an extent to industries and services outside car manufacturing market. The word thinking was added to distinguish Lean from a certain step-by-step tactic or a specific cost reduction model. Womack and Jones (1996) saw that Toyota's examples of success – pivotal findings developed in

company's contexts and over a long period of time – were hard to copy directly, unlike the overall approach. (Womack & Jones, 1996).

In the late 1990's, Womack and Jones combined five Lean thinking principles that they claimed were suitable for any service or product. These were specifying value, identifying value stream, creating flow, letting customer pull value from the service and aiming for perfection. (Womack & Jones, 1996, p. 10).

- **Value specification** was an analog for TPS's kaizen – an idea of continuous cycle of defining customer's expectations at specific times as well as developing and improving the overall service or production processes to answer Just-in-time needs. (Womack & Jones, 1996, p. 18).
- **Value stream** looked at all possible actions: what is done to establish and solve specific tasks, how information management and logistics are carried out as well what steps are taken to turn raw materials into sold products or conducted services. (Womack & Jones, 1996, p. 20).
- Womack and Jones (1996, p. 60) referred to Csikszenthmihalyi's thoughts on determination of **flow**. Csikszenthmihalyi (1998, p. 31) saw flow as a happiest state of work, which comes from full focus on the activity at hand. Formulation of flow is based on "balance between the challenge of the task and the skills of the person". In addition to this flow state of an individual, Womack and Jones also referred to flow as flexibility of value stream and its potential to adapt to customer's needs. They considered that a transparency of such workflow is crucial: when everyone know what is going on, feedback and learning is easier.
- **Pulling value** was needed to tie together different bits and parts of the value stream and to create good work flow for it. Value is pulled in by the customer. (Womack & Jones, 1996, p. 66).
- **Perfection** deals with mistakes learned through the virtuous circle of understanding what customer wants and how to provide it efficently without loosing quality. It's that never-ending "almost there" part of the work, which fragmentizes the understanding of what else there is to do into ever smaller details.

Seddon and O'Donovan (2009) argued that Womack and Jones' five-principle summary and recycling Toyota's methods such as 5s into "universal tools" were steps of TPS's codification.

From authors perspective, in service management these "how do we do it?" -answers, assumingly applicable to any organizations, eventually led to promulgation of original Lean paradigm.

Lean production and especially Womack, Jones and Roos' (1990) concept of Lean thinking were also strongly criticized by Stewart et al. (2009) in their overlook on changes in British car industry during past six decades. Stewart et al. (2009, p. 2–5) presented that Lean was aiming to pursue "class struggle from above" in order to achieve capital accumulation. They claimed that Lean thinking rhetoric such as "capacity adjustments" and "need to increase profitability" were eventually used for loose justification of excessive measures. As an example they pointed out to noticeable layoffs in 2006 including 34400 workers from GM's and 2400 workers from VW's Brussels plant, i.e. by the companies, which used Lean as their main work philosophy.

Stewart et al. (2009, p. 6) expressed that, despite theoretically humane approach, Lean companies are not listening and learning from workers but "often introduce rationalization measure despite worker or broader workplace opposition". As an overall thought, authors concluded that Lean, despite all promises of win-win situations between management and labor, has not solved the global problem of profitability and only made workers more suppressed.

2.2.2.3 Lean Service

After Lean thinking in 1990's, Lean has been used widely as an appendage to several fields and contexts, among others enterprise (Basu & Walton, 2011, p. 11), organizations (Liker 2004), service, design, Army, government, healthcare (Graban, 2012; Seddon & O'Donovan, 2009) and currently, in the heyday of digital media companies, especially in the context of startups and entrepreneurship (Ries, 2011).

Replications and extensions of Lean paradigm to other disciplines have not been flawless. Currently, it seems to be much easier to find proponents of the philosophy rather than actual case examples in which Lean is adopted, applied and sustained successfully.

In their paper "Rethinking Lean Service", Seddon and O'Donovan (2009) strongly criticize "Lean applications" where services are treated like production lines and where quality of carrying out key activities and reducing unit costs are seen as core objectives. This "factory view" has been applied for instance to various fast food chains and centralization or outsourcing of supportive activities such as customer service.

Seddon & O'Donovan (2009) think that Lean has been subsumed into a synonym of the conventional service management without significant improvement. They claim that services should be managed as systems, which constantly absorb variety rather than being standardized

assembly lines. Any changes should be emergent instead of something than is pre-determined or planned – in a similar way to original examples of Toyota. They cite Womack (2006) who also acknowledged that in the last decade Lean intentions have gotten fuzzy and it has been "stuck in a 'tool age"'.

As an example of overly pedantic application of Lean tools, Seddon and O'Donovan (2009) cite a failed case example of Unipart's 7 M£-worth consultancy to Her Majesty's Revenue and Customs department (HRMC) in UK. In a pilot exercise followed by 5s principle, office desks were cleared and unified, so that office staff could work more efficiently. Marker tapes were put, so items like staplers and forms would have their own place. Personal items such as lunch banana, which was not eaten immediately, were seen "inactive" and were instructed to be cleared away. Office workers thought that this scheme was demeaning, since they were old enough to tidy their desk themselves. (BBC News, 2007).

For more successful adaptation of Lean philosophy Seddon and O'Donovan (2009) suggest to revision Toyota's example and, when applying it to service context, putting stress on careful inspection and understanding of the overall process. For instance, in case of service, customers might have value demands and failure demands – latter occur when initial demand is not satisfied; something is missing, wrong, misunderstood etc. Customers then call, come by, and perhaps even write angry status updates on their social media profiles. Dealing with such reclamations and feedback means more time spent in vain and work, or waste in Toyota's language – both for client and customer. Similar feedback might reveal a more grounded problem, which can be then solved, so less reclamation would occur. Some of the value demands can also be expected: these are things that service can prepare itself for and adjust if demand is changed. Seddon and O'Donovan (2009) note that even if this type of waste and mistake proofing is not mentioned in the initial list or examples, it does not mean that it should not be considered important.

> "While Ohno's (TPS) purpose was to build cars at the rate and variety of demand, a transactional service system's purpose is, we argue, to absorb the variety of customer demand. Understanding the problem leads to tools (or methods) with which to solve it". (Seddon & O'Donovan, 2009, p. 9).

2.2.2.4 Lean Software Development

Even though software development is outside the scope of this master thesis, it is in great role of the thesis' case project – developing an online service. In this chapter, Agile and its connection to Lean will be briefly introduced.

Agile is a collection of incremental software development methods promoting, among others, time framed iterative development cycle, self-organization, adaptive planning and capability for rapid and flexible changes. Term was introduced in Agile Manifesto, proposed by several software development professionals in 2001. Agile methods such as Extreme Programming and SCRUM were developed as alternatives to heavy documentation driven development processes. Agile's core values are in appreciation of individuals and interactions, working software, customer collaboration and responding to plan. Philosophy puts less value on tools, comprehensive documentation, contract negotiation and following plans. (Beck et al., 2001).

Gualtieri (2011) criticized Agile for misplacing software development outside business environment. He wrote that development is becoming an even more multidisciplinary work aimed to produce "software experience" rather than simply working code, which he considered Agile was promoting. Gualtieri's opinions might be however biased, since he is a promoter of suggested successor methodology of his own, named STUDIO.

Markham (2010) claimed that Agile success, noticeable in dozens books published and conferences held annually, is based on fake success stories, adherence and scam. He argued that agile is not a set of tools or a standard – it's a marketing term for soft values which focuse on people, principles and adaptation. Markham noted that ideology itself is worthwhile, as well as the concept of iterative and incremental development, but in reality it is an art rather than a science – something one might or might not master with time via doing, reflecting and adapting.

Roughly described, Lean Software Development is Lean philosophy principles applied to Agile methods. Mary and Tom Poppendieck (2003, p. xxvi – xxvii) stated that success of Agile practices (witnessed by numerous seminars, workshops and publications in the past decade) can be explained by understanding this riverbed of original Lean principles: following guidelines such as deciding as late as possible, delivering as soon as possible, building integrity and seeing the whole.

As seen, many Lean followers reshaped new domain specific and practical tools and methods after adaptation of general principles of TPS. Lean Agile has not been an exception. For instance software development principle kanban has gained attention recently, especially in the context of SCRUM. This popularity could be noted for instance in books like "Scrumban - Essays on Kanban Systems for Lean Software Development" (2009), active forums including "kanbandev" (2012), consultancy work as one by Lean-Kanban University (2012) and meet-ups such as Lean-Kanban 2012 conference. Kanban refers to a signal card system originally used by Toyota to support Just-In-Time -manufacturing (Womack & Jones, 1996, p. 236). Due the novelty of Lean Agile's kanban principle, it is hard to find reliable research on whether the method is good or bad,

or whether it has certain limitations in its applicability. An interesting aspect is how the notion of kanban has quickly gained all spectra of meanings, from being a "workflow visualizer" and "tool for personal backlog" to "mechanism for controlling the work in the software development system" (Kanbantool, 2012).

2.2.3 Lean startup

Lean startup might be viewed as most related application of Lean to the thesis project, though due to its novelty it should not be viewed standalone or as a silver bullet. Lean startup (also simply Lean) is one of the latest derivations of the original Lean philosophy, applied to IT-startups and entrepreneurship. IT prefix was here specifically added due the focus of the thesis. Though the origins of Lean startup are in the IT-startups saturated Silicon Valley (Wikipedia, 2012b), approach is argued to be suitable for any type of business (Ries, 2011).

In brief, Lean startup is an "application of Lean thinking into process of innovation" (Ries, 2011, p. 16), providing methods to measure progress in the situation of great uncertainty. By this uncertainty Ries refers to highly competitive market and, from his perspective, great unpredictability and risks.

Lean startup is based on original Toyota's Lean principles of creating customer value and redesigning out wasteful actions, though Ries occasionally (2011, p. 55) refers to this principle as Lean thinking (a term, which was introduced, as seen in literature review, only in the 1990's and already criticized by its originators). Ries (2011) claimed (p. 20, 147) that the main point of Lean startup principle is to scientifically approach any experimental hypothesis through continuous Build-Measure-Learn feedback loops (Figure 2-5), in order to make strategical plan of actions based on validated learning – either to continue working or to pivot and try something else. Waste lies in everything that does not benefit the customer.

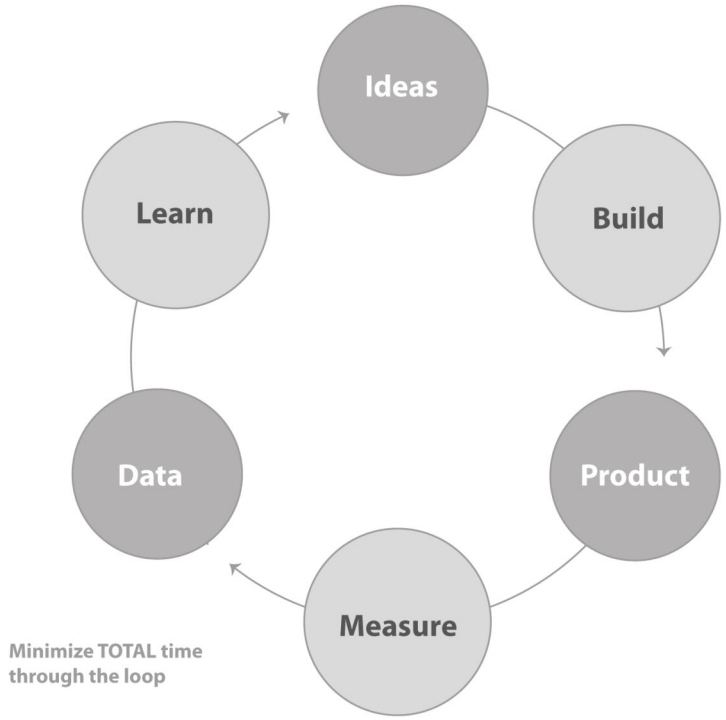

Figure 2-5. Build-Measure-Learn Feedback loop. Adapted from "The Lean Startup", by E. Ries, 2011, p. 81. New York, New York, USA. Crown Business.

Ries (2011, p. 18) conceptualized Lean Startup in five main principles described next:

- **Entrepreneurship is all around**

Intepreting the notion of entrepreneurship has intrigued scholars for long. Cantillon (1775) and Say (1803) saw entrepreneurs as individuals and economic agents with management and leadership skills; Schumpeter (1934) saw them as innovators; Danhoff (1949) as activities; Kilby (1971) as technology imitators; Shapero (1975) as risk takers and Gartner (1985) as people who start new businesses "where there is none" (as cited in Wikipedia, 2012c). In the context of current online startups, Blank (2010), one of the authors of Customer Development model, is often quoted: "A startup is an organization formed to search for a repeatable and scalable business model". Blank considered that fresh entrepreneurs start with a service vision and have changing hypotheses about various business elements such as pricing and customer segments, which are then validated. Ries (2011, p. 12) saw entrepreneurship as "any human institution designed to create new products and services under condition of extreme uncertainty".

- **Entrepreneurship is management**

Ries (2011) claims that because teams might not know anything about the future and their clients, they should avoid trying to apply typical business methods of profound planning and

forecasting. On the other hand entrepreneurs should not give up management and leave it all to chance either – this would only result in wasted resources, a term familiar from original Lean principles.

- **Validated learning**

Ries (2011, p. 20) stated that teams, even when only starting the project, might use scientific experimentation for creating sustainable businesses. Such learning evolves from "Build-Measure-Learn" loop (figure 2-5), or as he explains, among others "leap-of-faith" assumptions, building Minimum Viable Products (MVP) and testing (2011, p. 20). Ries (2011, p. 61, 141) also argued that, in fact, everything that startup does – such as service features, marketing campaigns, design decisions, hypothesis of customer archetypes or even "best practices" of the industry such as usefulness of lazy registration in online service – should go under validated learning.

- **Build-Measure-Learn**

Building refers to creating, with a minimum amount of effort, a Minimum Viable Product (MPV) that could go through Build-Measure-Learn loop as quickly as possible. Such testing will result in validating learning, which will tell whether one should continue development from the original assumption or try something else. While MVP might well be imperfect, it does not necessary mean that it should be the smallest or the cheapest version of a concept, if it is not enough to test set assumptions (Ries 2011, p.96). The complexity of MVP might range from smoke tests to early prototypes (Ries 2011, p. 98). For designing MVP, Ries (2011, p. 93) reflects among others to techniques well known in interaction design, including rapid prototyping, in-person customer observation and designing for customer archetype – as an extension to user archetype, persona (Goodwin, 2008a; Goodwin, 2008b).

Measuring is done via establishing related metrics for each assumption. For instance a good interface design might be seen as something that adds customer value. Designing with usability standards takes time. A metric for measuring whether tuning design has paid the effort could be done with e.g. activation rate of new customers or comparable results in scripted usability testing. (Ries 2011, p. 120). In a same manner as TPS principles had "checklists" such as 5s, author too present three main pinpoints that should be applicable to any selected measure: actionable, accessible and auditable. First refers to demonstration of cause and effect, second – making reports comprehensible and visible to team and third, using data derived from real usage of the service and testing it by talking to customers directly. (Ries, 2011, p. 144–146).

In terms of learning Ries (2011, p. 90–92, 139) mentiones ideas such "genchi gembutsu" or "getting out of the building", familiar from TPS, and kanban principles, adapted from Lean Agile.

- **Innovation accounting**

Fifth principle introduced by Ries (2011, 18, 114) is innovation accounting – a systematic approach for measuring achieved validated learning. In summary it refers to management actions needed for continuous validated learning i.e. setting metrics and milestones, measuring progress and prioritizing work.

2.2.3.1 Similar models

While Ries' work (2011) can be seen as an introducer of term "Lean startup", similar ideas can be viewed for instance in recent publications by McGrath (2010) as well as Mullins and Komisar (2010).

McGrath (2010) wrote about a discovery driven approach for building and evaluating business models suitable for highly uncertain, complex and fast-moving markets. McGrath proposed that experimental modeling and prototyping is suitable for starting companies competing in such environment. She suggests that strategies require "insights, rapid experimentation and evolutionary learning."

Mullins and Komisar (2010) talked about taking a leap of faith approach and being open for discoveries on entrepreneur's learning journey, which might lead to surprising destinations – so called "Plan B" business models.

Both ideas are closely related to Ries' (2011) proposals of validated learning and reshaping of business idea through systematic assumption testing.

2.2.3.2 Discussion

Despite contemporary thoughts and proposed methods by Ries (2011), most of his and similar views can be strongly criticized. For example the severity of IT-startups competition in Silicon Valley (Wikipedia, 2012b) and the competition status in "IT-startup scene" in Nordic countries are hardly alike. In addition, buzz that influences the mindset of extremely uncertain market might be far fetched. For instance quasi-statistic "90% of business fail in five years" regularly quoted in related media channels, e.g. Empson (2011) in TechCrunch and Zwilling (2012) in Forbes, might be undounded and inflating (Shane, 2008).

Due to novelty of Lean startup approach, credible peer critique is difficult to locate. Pelling (2011) presented some of the strongest objections. He argued that Lean startup is a mixture of "old Lean", Lean Agile principles and customer development ideas presented by Blank (2012). Author presented concerns that at worst, Lean approach results in anti-engineering as "design decisions are based more on incrementalism than disruption". Especially last argument can be supported, since validated learning might take equally a lot of time and still result in many wasteful development hours. However, slow incremental building has been proved to be a working concept for instance in the case of online dictionary Wikipedia (2012d). Pelling (2011) also argued that Lean Startup in general does not fulfill the criteria of scientific approach, especially based on the lack of empirical proof: so far, not many businesses have actually applied it. He stated that the approach is "relentlessly Darwinian" and not backed up with academic proof that customer feedback and constant iteration would actually result in successful venture.

For more in-dept analysis Lean startup as well as all other successors of original TPS should be analysed through cultural perspective, but this discussion is left out of the scope of this work.

2.2.4 Lean principles: summary

During the years the primary idea of Lean has not been changed. Designing with Lean principle refers to searching ways to provide a great customer value with efficiency but without compromising product quality. It has been though argued, how exactly this could be done and what methods and metrics should be used for the process and evaluation.

As seen in this literature review, original Lean ideas have been interpreted as both: as guiding principles and as admirable practical example of pragmatic approach to ancient question of creating value with efficiency. Through the years of its existence Lean principles has been picked up various industries, including manufacturing, service, software development and most recently, startup-oriented project management and entrepreneurship. Ideas derived from TPS have often been methodized and occasionally codified by researchers and domain experts to serve better the needs of specific field. Every transformation faced praise and critique – at best Lean has been seen as a buttress for experimental hypotheses and validated decision making, at worst as an expensive consultancy scam and a set of empty maxims.

The second research problem of the thesis was dealing with the question of using Lean as a guiding principle and a framework for designing valuable online service. Value in such service was roughly described as good user experience. Based on literature review following aspects are extracted for the thesis project:

- Design of thesis project (an online service concept) is guided by main Lean principles: creating customer value, redesigning out waste and aiming for perfection.
- Customer value is studied through exploring means for "good user experience" in the context of the project.
- Redesigning out wasteful actions and features as well as striving for "perfection" is balanced by project resources, assumptions and validated decisions. Project related assumptions are seen as experimental hypothesis suggested to validation.
- Addition of domain specific ideas, introduced in Lean startup principles and discovery driven approach of business models, are taken into account. The project adapts approach of building Minimum Viable Product (MVP) and applying validated learning through Build-Measure-Learn loops.
- Selected metrics have to be actionable, accessible and auditable.

2.3 Connection between Lean and User Experience in the context of thesis project

Based on literature review, several connecting points with Lean ideology and User Experience might be found. Despite the differences in objectives of interaction design (i.e. good usability, positive experience) and business principles (i.e. increasing revenue), both approaches put user – or client – in a focus of the design. Nielsen, Norman and Tognazzini (2011) proposed that user experience is "all aspects of the end-user's interaction with the company, its services, and its products", pointing out that company needs to make numerous assumption of how its service is perceived by the user. For instance through interviews and usability testing it might be discovered that users understand service's concept and are able to complete main tasks well, but in real life they would not use the service because in their opinion, it is not "cool" and attractive enough (Jetter and Gerken, 2010, p. 1–2). As there are enormous amounts of possible individual and dynamic assessment attributes, a guiding framework, which will create a focus for design project, is in place. When the goal of the project is to find optimal points of providing good user experience and building a valuable business concept, Lean can be seen as another supportive set of values.

Designing for good user experience and designing with Lean ideology both require experimental iteration and as Ries (2011, 93) noted: "in-person customer observation". It could be argued – though validation of such claim lacks scientific support – that Lean can be beneficial as a guiding

principle when designing for good user experience. Lean principles of designing out waste and focusing on customer's value can help to maintain a balance when team is faced with various choices and need to decide whether to proceed or pivot. Lean startup's additional practical suggestions of e.g. building a Minimum Viable Product and striving to achieve validated learning can administer to form a project framework and set overall goals already at the stage of concept creation.

3 Research

3.1 Project description

The project has started in January 2011 and is being continued until recently. The research of this project has been carried out until December 2012. Research artifact presented for this thesis is a live "Roomforit.com" demo published at Aalto University's ACE's "Aalto Startups in MoA" event (http://ace.aalto.fi/index/17?eventId=64&pageid=116) on 14.5.2012 in Helsinki, Finland. Also some of the prototype parts, developed after publication of demo are included – this was needed to construct mockups that were used in usability testing and interviews. Outcomes of the usability tests and interviews as well as critical evaluation of the project in the light of thesis topics are discussed in the Result chapter.

Introduction of the project is divided into four chronological phases – idea, concept, demo and prototype. In this research, phases have following meanings:

- **Idea** chapter describes formulation of strategic business idea.
- **Concept** covers interaction design.
- **Demo** part expresses design actions taken in order to create a live demo.
- **Prototype** briefly describes main discoveries done during the post-demo phase.

Documentation is projected through lenses of UX and Lean. Study is particularly reflecting on following aspects:

- **UX:** Approaches and solution related to designing for good user experience;
- **Lean:** Application of Lean principles, including:
    - Determining, building and evaluating Minimum Viable Product (MVP)
    - Determining and redesigning out 'waste' and creating customer value
    - Validated learning and strategic decisions

Figure 3-1 describes evolvement of the project over time. Because several changes were made to the live demo after its publication, prototype and demo phases visibly overlap.

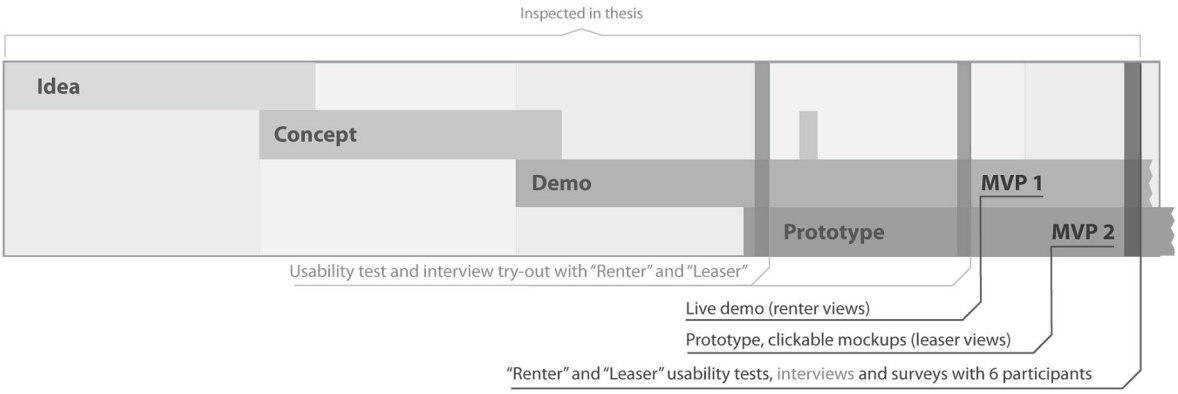

Figure 3-1. Visualization of the four project phases.

Most of the data presented in the timeline figure is based on notes of a private blog located at http://imkethesis.wordpress.com. In this work, references and quotations from this source are marked as "personal blog post" in other to distinguesh from other type of personal communication. Screenshot of the blog is shown in Figure 3-2. Private blog was created at the beginning of this thesis research and updated regularly. By the beginning of December 2012, blog had over 100 published notes. Documentation was supported with, among others, notes in free project management system Podio.com, shared documents in Google Drive, simple remarks in NotePad, photos, screenshots, design file versions and clickable online mockups.

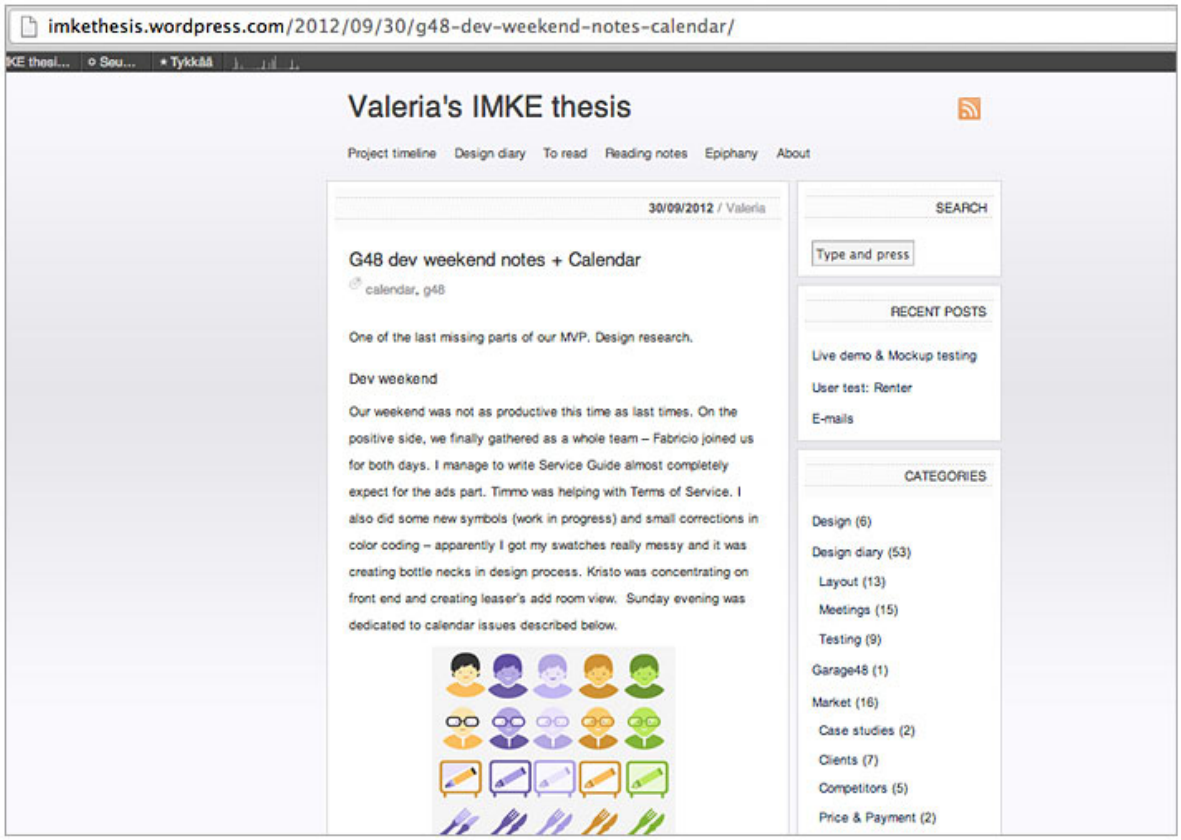

Figure 3-2. Private research blog. Screenshot. Retrieved from http://imkethesis.wordpress.com.

3.1.1 Idea

Garett (2002, p. 32–33) outlined that, as in any business, web service projects should start with a strategy – an idea of what one is building, or more specifically, what are user's needs and site's objectives. This project began with experimenting with an unpolished and large-scale idea: connecting people, resources and workspaces. The purpose of the idea phase was to validate this initial thought, to formulate a basic understanding of what type of services and attributes might be valuable for the customers and what could be realistic and feasible in the terms of knowledge and resources at hand. During the idea phase, only one person was working on the project during her spare time.

3.1.1.1 Idea 1: Linking people, resources and rentable spaces

Initial idea (Appendix B) was composed for Master Thesis Seminar: "Toteuta.se -online service will assist users to locate and link together people, groups/resources and rentable spaces. This free service will enable Lean and local connectivity" (Personal blog, 1.1.2011).

Segmentation was based on unconfirmed assumptions. Users of this service were thought to be people working in creative industries (artists, freelancers etc.) who were looking for professional projects or workspaces. Groups and resources were associated with projects such as organizing events, carrying out workshops and creating campaigns. Workspaces were seen as any facilities suitable for work and gathering: from half of a desk in shared office to an empty hall suitable for large seminars.

Although the first idea was vague, it already expressed intended value for the customers (providing a platform for connecting resources) as well as intended market position (e.g. local). "Toteuta.se" was a work title, a word play and a domain suggestion, which could be translated from Finnish as "do.it". The working title was later changed to iRent.

3.1.1.2 Idea 2: Flexible work space booking

During Creative Entrepreneurship course in Tallinn University in Spring 2011, the initial online service idea was studied and redefined in executive summary (Appendix C). From interaction design point of view (Garett, 2002) next step would have been establishing user needs, service objectives and project scope. Executive summary goes slightly beyond this and studies business perspectives by looking on market, strategic directions, resources and steps. Paper also outlined initial implementation plan and needed team roles: web developer (back-end and front end), web designer (interaction and graphics), project manager and marketer. In idea and concept phase, last

three "hats" were worn by one person, which significantly limited working time, reflected upon available resources and affected motivation and decision-making.

Retrospectively, reshaping initial idea in a business plan can be regarded to be beneficial, since it establish a framework for the project and visualize possible business opportunities as well as formulate idea of what might bring value to the clients. For example market analysis done via observation of related forum conversations and benchmarking current services helped narrow down main business targets from matchmaking people, projects and facilities to concentrating on connecting people and workspaces. It became clear that extensive efforts would be needed to build a community with so many moving pieces; such efforts, even if well executed, might also be done in vain, since market research reveled that there were already well operating professional communities such as Finnish creative forum Pingstage.nu, film community Wreckamovie.com and professional network LinkedIn.

3.1.1.3 Idea 3: Meeting rooms booking

Rohrer (2008) pointed out that from perspective of user experience, the goal of strategic phase is finding inspiration, exploring new ideas and spotting opportunities. In the light of Lean, one can argue that ideas formulated in the beginning of the project are also hypothesis of service's vision and its elements. These hypotheses are subjected to change after going through the loop of building, measuring and creating validated learning (e.g. Blank, 2010; Ries, 2011). In other words, first phase includes finding references, forming insights and creating idea that is realistic, feasible and flexible for modification.

These goals were kept in mind when research continued in Summer 2011 with more detailed market observation, conversations with peers and experts (e.g. personal communication with H. Palmar & R. Pikkar, 20.5.2011; A. Goutsoul, IA director, Enkora Oy, 1.6.2011; J. Laine, Innovation Manager Oy, 10.6.2011) as well as discoveries drawn from studying facility related posts on websites like Toimitilat.fi and local creative forums such as Pingstage.nu (e.g. personal blog post 2.7.2011). In addition, research was supported with competitive analysis and benchmarking existing services. In studies, focus was especially set on comments, features and processes related to booking professional work facilities (e.g. personal blog post 19.8.2011).

Mentoring and commentaries by representative of booking system provider Enkora Oy (personal communication with A. Goutsoul, 8.8.2011) guided to strategic decision of limiting service concept to meeting rooms. There were three main reasons for such decision: market segmentation, simpler booking process and rationalization based on personal experience. Dealing

with meeting rooms means faster clients turnover, which was also beneficial for the objectives of the research. Here, logistic refers to a process that is more straightforward than the one related to booking office spaces. For instance renting out an office space would require dealing with insurance, arranging furniture use, negotiations of renting contracts with various terms, paying lease guarantee and so on. Meeting room rentals, on the contrary to office spaces, require much less hassle. It was also thought that due to personal experience with meetings, it was easier to relate to meeting room booking processes than to arranging offices. Meeting rooms also has more or less standardized set of facilities, whereas offices contracts tend to be complex.

3.1.1.4 Idea phase: summary

Table 3-1 summarizes research methods, main ideas and competitors as well as reasons behind pivotal decisions discussed in the previous chapter.

Table 3-1. Summary of business research methods, intended UX values and strategic changes.

	Research tools and approaches	**Main idea**	**Designing for good UX: Main intended values**	**Lean: Main reasons for narrowing down the idea**
Idea 1 Winter 2011	Personal discoveries and interests.	**Connecting people and groups, resources and rentable workspaces.** Tagline: "Toteuta.se – Do.it"	Findable: Users can find everything in one place – jobs, projects, skilled people and working space.	*Not yet available for the first idea.*
Idea 2 Spring 2011	Executive summary including market analysis, competitor analysis, customer target groups, service description and plan.	**Connecting people and workspaces.** Tagline: "iRent is like Airbnb.com for Lean workspaces."	Findable: Users can find related information of work spaces in a single online service Useful: Additional actions not provided by others, i.e. customers can add and manage their own rooms in the service.	The scope of the first idea was too large: there is already a great range of services that help people in various creative fields to connect.
Idea 3 Summer 2011	Peer and expert feedback, competitive analysis, benchmarking of exising services	**Connecting people and meeting rooms.** Tagline: "iRent is like Airbnb.com for meeting rooms"	Findable Useful Usable: Service is focused, informative and easy to use.	Re-evaluation of technical feasibility of the project. Limitations by resources (time, work load, costs) and knowledge at hand.

During the early stage of the project it became clear that the initial idea of connecting people and groups with resources and workspaces was too broad.

In contrast to business management, from interaction design perspective, outlining business proposition at the idea stage might be rather arguable. Lean on the contrary suggests a holistic approach to web service design right from the beginning. In the project's context, the benefit of experimenting with business idea was clear. While original idea was seen as interesting and challenging, based on the gathered information and initial understanding of the concept with a reflection on resources and knowledge at hand, by the end of the summer, business idea was narrowed down to connecting people and meeting rooms. Narrowing down brought along thoughts regarding intended UX assessment values: findable, useful and usable.

3.1.2 Concept

Project was continued with framing and describing service concept in more details as well as with various design actions carried out prior to designing for the live demo. In the context of this work, the concept phase (July - December 2011) was partially overlapping with the first part, formulation of business idea. After the first phase, a part-time developer was included in the project in the role of technical consultant for software backend development.

Work during concept phase was driven by three main questions:

- What is the business mission of this online service?
- What would service's clients want to accomplish?
- What could enhance positive user experience; what would make customers happy?

During concept phase, different methods and approaches adopted from interaction design, project management, business administration and service design were applied – some of them are summarized in roughly chronological order in Table 3-2. While close study of most of these methods is left outside the framework of this thesis, they were briefly presented in the table in order to visualize the variety of approaches used for this project. Few approaches are briefly discussed further.

Table 3-2. Summary of research and design methods and approaches during concept phase. Dates in the table refer to posts in project's blog (personal communication).

Method / approach	Purpose	Result
Expert advices (e.g. 1.6.2011; 23.6.2012)	To collect best practices and tips from professionals of interaction design and development of booking systems.	• New domain specific knowledge • Customer stories • Suggestions for MVP
Data analysis – gathering information from online sources (i.e. 10.6.2011)	To get familiar with channels people use for communication regarding workspace rental; to gather insights about potential customers and their experiences.	• Segmentation • Provisional personas • Reference for use actions
Segmentation and user types (10.6.2011)	To see differences between various customer segments and to understand their effect on provisional personas.	• Set of user groups: owners of multiple facilities, owners of one facility, meeting room bookers, hot desk bookers and office bookers
Use actions (2.7.2011)	To visualize main service processes.	• Mind map of use actions • List of use actions • List of needed views for demo **Strategic change:** Giving up "hot desk" booking
Competitor research, benchmarking (i.e. 12.8.2011; 3.9.2011)	To understanding the state of the art; to explore new ideas how to make a better service; to find out what might make users' experience more positive in comparison to existing solutions.	• New knowledge • Template for first medium fidelity prototype • Data for positioning and service identity formulation in later phases
Medium fidelity (me-fi) prototypes (6.7.2011; 6.9.2011)	To compose an interactive visualization of main service views; to create a credible conversation starter	• Two clickable mockups **Strategic change:** Leaving office rent outside service concept; concentrating on meeting rooms.
In-team discussions (e.g. 7.7.2011; 19.8.2011)	To analyze project's potential and structure; to create understanding of what this online service is about and how to start developing it.	• Initial project plan • Suggestions for me-fi mockups • Design feedback on medium fidelity prototypes
Expert feedback (e.g. 8.8.2011; 9.9.2011)	To get expert's feedback on first mockups; to validate strategic decision of concentrating on meeting rooms	• Feedback and suggestions • Support of strategic decision of concentrating on meeting rooms
Project planning (e.g. 12.12.2011)	To create project plan for demo development; to allocate time and resources needed for design	• Project plan • Gantt chart

3.1.2.1 Second hand data

Lean startup principles encourage for validated learning and testing service hypotheses from the early stage. In this project there was for instance no participatory design techniques involved. All assumptions about clients during concept phase were made via analyzing secondary resources such as expert's feedback, message boards and posts on meeting room listings. Though for example message board could be assosiated with a natural use of the product (e.g Rohrer, 2008),

it is not clear whether the insights withdrawn from forums' analysis were correct. Personal experience in meeting room booking could be seen beneficial but also biased: one could argue that there was only a fraction in time before this first-hand knowledge blended in assumptions and hypotheses developed during further research.

Ries (2011, p. 96–98) pointed out that complexity of MVP might range from smoke tests to early prototype and should not necessary be the smallest and cheapest solution. Relying purely on secondary resources was rationalized with the thought that talking to clients about this project should be backed up with a visual demo – a credible and tangible example that would take discussion on more detailed level. Based on research and casual comments from people working closely with work facilities and meeting rooms, it was concluded that approaching with idea of yet another booking service would be perceived with unwanted reservation and skepticism.

3.1.2.2 User types

Second point of discussion is related to users. From interaction design perspective, persona research could be seen to be unfinished, which was acknowledged in the thesis blog (personal communication, 2.7.2011). In the light of Lean, persona can be extended with customer archetype (Ries, 2011, p. 93).

Despite that there were attempts to identify and conceptualize customer's behavior patters and desired values, as proposed by e.g. Cooper (2008), project missed a step of actually creating a tangible reference for personas. Since the lack of the textbook type of illustration of persona – usually an A4 post with picture, background details and a narrative – as well as missing first hand data, which is typically collected from interviews and direct observation, segmentation led to quasi-personas or provisional personas.

The closest approach to textbook provisional persona was expressed in the short stories and the mind map exampled in Figure 3-3 and Figure 3-4. In Figure 3-3, short stories were based on personal experience; information from forums and facility listing as well as comments from domain experts – some parts such as names and demographical information were invented. The purpose of the quick drawing, in Figure 3-4, was to illustrate assumed thoughts of "speed and flex renters" (personal blog post 2.7.2011). The mind map was done from the first person perspective of two user types – hot desk and flexible office renters. Both were approached with questions such as "what would I need", "what is important for me" and "how do I feel about this (iRent) service".

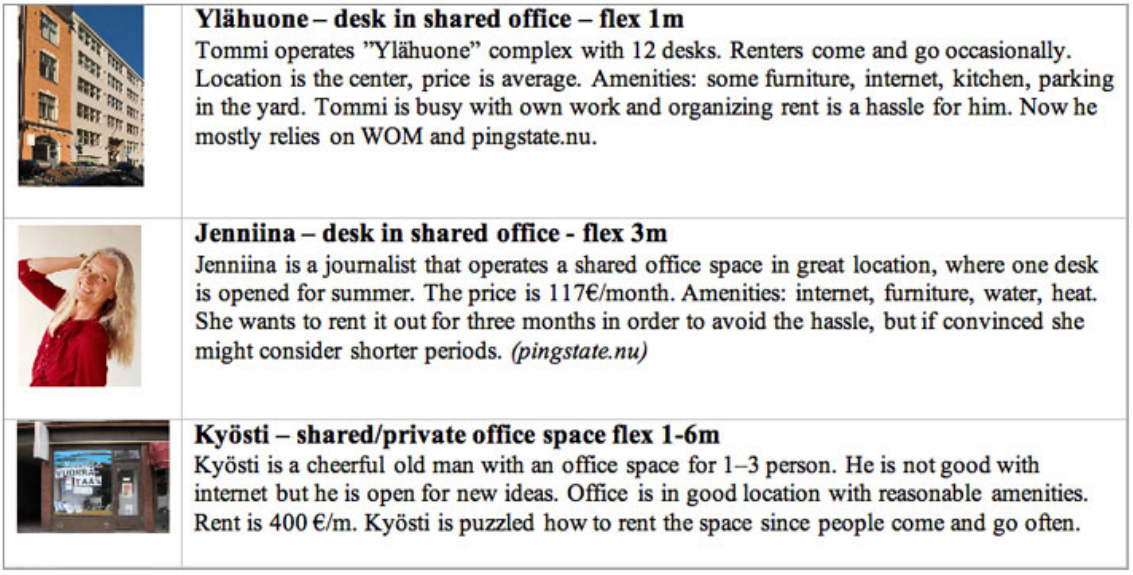

Figure 3-3. Part of a document describing potential users. Screenshot. (Personal blog post, 10.6.2011).

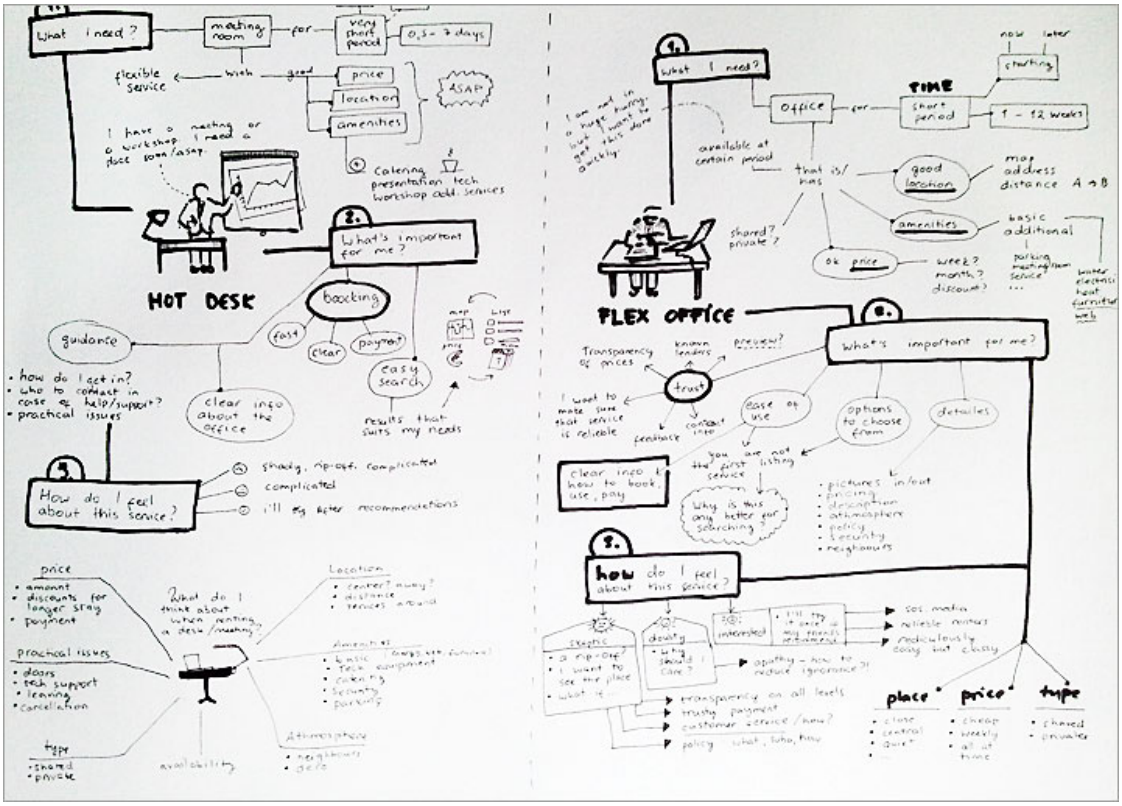

Figure 3-4. A3 mind map of user thoughts. (Personal blog post, 2.7.2011).

3.1.2.3 Mockups and Testing

Third point relates to an absent of a commonly used interaction design method that could be also promoted in the light of Lean principles and aim for rapid validated learning – testing with paper prototypes. In this project, comments and feedback on medium fidelity mockups were gathered from consulting developer (e.g. personal communication with K. Vaher, 7.7.2011, 10.7.2011,

19.8.2011) and experts (e.g. personal communication with A. Goutsoul, IA director, 8.8.2011).

There was no testing of paper prototypes or wireframes. It could be thus argued, that validated learning during concept phase was not done properly. Leaving out designing and testing paper prototypes as well as skipping designing wireframes was reasoned with intuitive understanding of booking process based on gathered data, personal experience of participating in meetings and using various online booking systems (e.g. movie tickets, hotel booking, travel booking), collected understanding of best practices in the field (e.g. profound mastery in design tools such as Photoshop, Illustrator) and will to create visual and clickable demos quickly (e.g. "i-Rent Mock-up #2", https://www.mocklinkr.com/viewer/2051#28049; Figure 3-5) that could work as a base for further conversation.

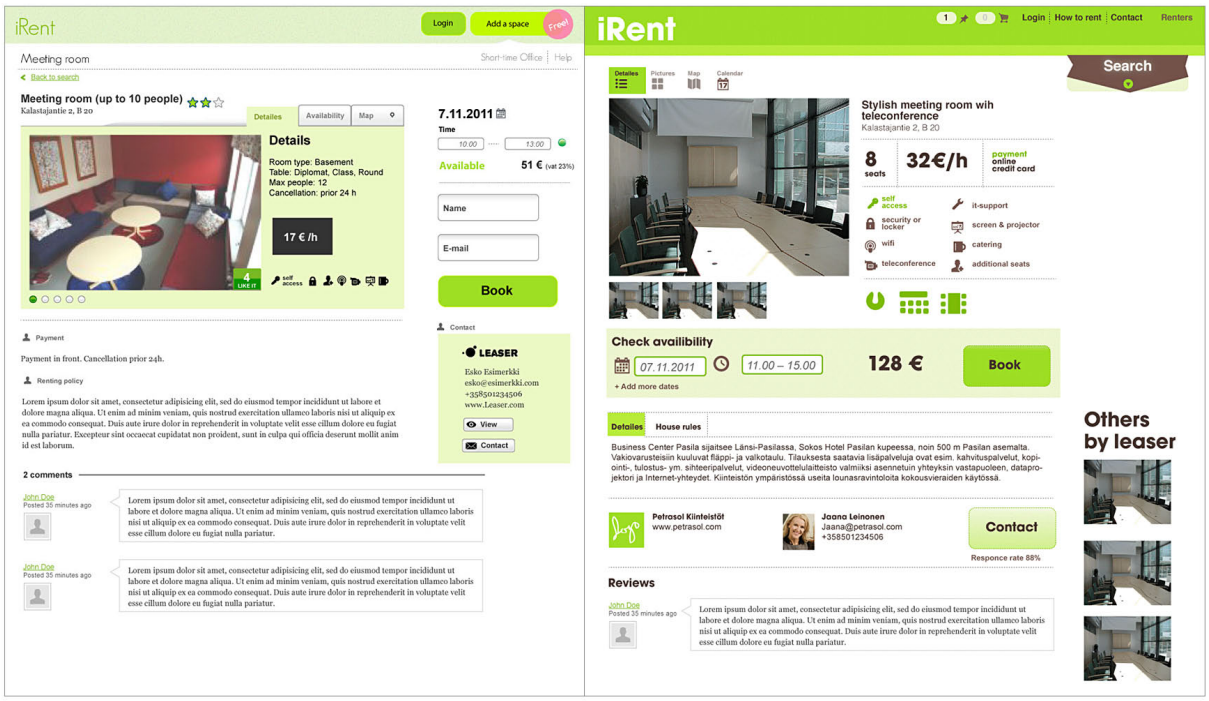

Figure 3-5. Room profile views in Mockup version 1 and Mockup version 2. (Personal blog posts, 7.6.2011, 6.9.2011).

First two mockups (Figure 3-5) were inspired by the appearance of apartment booking service, AirBnB.com (2012). In executive summary (Appendix C), similarities of iRent service concept and AirBnB.com were discovered. It was seen beneficial to adopt, with sufficient level of modifications, some of AirBnB.com service's established best practices for initial mockups and redesign or design out unnecessary parts during next phases. In terms of this project, before diving into testing, learning of state of the art and best practices took place.

3.1.2.4 Project planning

In December 2011 iRent project plan (Appendix D) was introduced for Tallinn University's Project Management course (http://www.tlu.ee/~pnormak/PJ-2011-IMKE/). Document included information such as concept visualization (Appendix D, p. 3), project milestones and resources (Appendix D, p. 6), project timeline (Appendix D, p. 7), Gantt chart (Appendix D, p. 8). In order to better formulate ideas presented in the project plan, concept was also reflected on Business Canvas (personal blog post, 2.12.2012). Project management is excluded from this research but it is worth to note that composition of these documents required thoughtful exploration of the service concept and it's design process, which in turn, derived more useful knowledge. Writing project plans helped to express service concept more clearly, to create a set of realistic milestones and to lift motivation for development.

3.1.3 Demo

Demo phase took place between December 2011 and May 2012. The objective of this phase was to develop a Minimum Viable Product (MVP) – a live demo that could be discussed. Project was done in collaboration with a developer who was responsible for back-end and front-end development. The viable artifact was a live public demo, published at demo.roomforit.com for Aalto University's ACE's "Aalto Startups in MoA" event on 14.5.2012 in Helsinki, Finland (http://ace.aalto.fi/index/17?eventId=64&pageid=116).

3.1.3.1 Structure

Design process was guided with Lean principles and aimed for creating a positive user experience. At the beginning, especial focus was set on designing for mistake proofing – an idea that could be associated with TPS's approach "poka yoke", or if studied on more abstract level, design waste. From user experience perspective, mistake proofing could be connected to aim for good usability, application of general best practices and avoidance of common web design mistakes. Such widely acknowledged pitfalls are for example bad search, unsorted text walls, failures to answer user's questions and violation of design consistency (Nielsen, 2011).

Creating "iRent" demo was supported with interaction design methods and approaches like use stories (personal blog post, 21.12.2011) and sketches (personal blog post, 27.12.2011). Although these methods were useful, it was difficult to use them ad hoc.

For instance drawing paper wireframes for room management views (personal blog post, 27.12.2011) revealed two curious aspects regarding practical utilization of the approach. Instead

of drawing simple page layouts, rapid sketching turned quickly into rather detailed visualization of an intuitive, sequential usage scenario (Figure 3-6): a view for logging in, for adding a room to the service, a view for previewing the room and so on. At the end notations resembled a combination of a scenario, wireframe and state transition diagram.

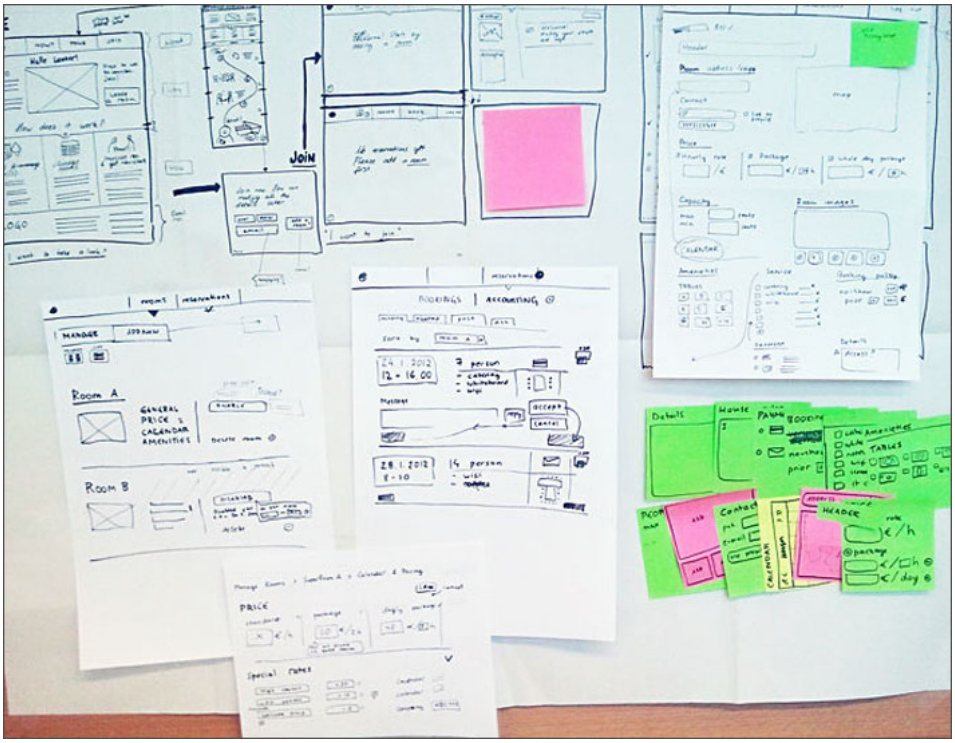

Figure 3-6. Figure X. Paper prototypes and post-it design parts for various leaser's views. (Personal blog post, 27.12.2011).

Since such visualization (Figure 3-6) helped to outline action flows and produced ideas about service's look, it was rather helpful, except for "Add new room" layout. For it, neither quick sketching nor detailed drawings were working well. Personal experience and gathered information did not extend to knowledge regarding priority of information needed for adding new meeting rooms in the service. Needed elements including room's location, tables, pictures and services were fairly obvious but their importance and sequence was unclear.

> "If there is too little questions and functions, this service will not look reliable but rather than like a toy. If there is too many – this will end up to be another system that is de-attached from the reality. – – [I] hear discussions over coffee table about all the hassle and inconvenience that any recent system has caused. In the department where my temporal desk is situated, they even gave up using any online system for meeting rooms booking – there is a paper calendar hanging on a wall which makes everyone content." (personal blog post, 27.12.2011).

Because of the holiday season and no opportunity to gather direct feedback, it was decided to take leap of faith and design a mockup (personal blog post 3.1.2012) of room provider views, which felt best based on the information at hand. Expert feedback (personal blog post 3.1.2012) and comments from developer (5.1.2012) helped to redefine the design but it was agreed that comments from real users would be eventually needed.

3.1.3.2 Identity

Considerable amount of contextual feedback from experts and colleagues (e.g. personal communication with A. Goutsoul 3.1.2012; K. Vaher 5.1.2012, 16.2.2012) and friends and family (e.g. personal communication with J. Flinkman, J. Fallström, A. Lahtinen, S. Nikkinen & H. Laitila 6.2.2012; J. Fallström & T. Gasik 14.3.2012) as well as playing around with competitor's booking services (e.g. personal blog post 27.12.2011, 28.12.2011) and analyzing their appearance (personal blog post 23.4.2012) strengthened the assumption that – in comparison to available solutions on the market – good usability and usefulness were important UX assessment factors in the case of Roomforit.com. Based on discoveries of similar service examples on the Finnish local market that were poorly executed (e.g. personal blog post 27.12.2011, 28.12.2011), it was also assumed that iRent would need to go beyond usability in order to gain attention and nice reactions (personal blog post 27.12.2012). Based on these findings from February 2012 onwards, scope of design focus was extended to building service identity and designing for positive user experience in addition to good usability.

Identity design referred to creating an appealing service name – Roomforit.com (personal blog post 5.7.2012), brand, high fidelity layout views and other visual elements.

Another challenge was to make service appear desirable in the eyes of the users already at the demo stage. Desirable refers to thoughts regarding advised brand value (personal blog post 23.4.2012). Service was intended to catch the eye and differentiate from similar services. In additional to being useful, it aimed to be perceived as fresh, modern, credible, light, distinguishable, friendly and helpful. It was considered important that both user groups – room renters and room providers, leasers – should like the service equally.

3.1.3.3 Testing

Though usability testing with domain representatives was postponed, identity design was supported with numerous contextual comments and feedback from consulting developer, colleagues, friends and family (e.g. personal blog post 16.2.2012, 14.3.2012).

In order to prepare for future usability tests and interviews and understand the logistics of conduction such meetings, two experimental sessions were held: one with a representative of meeting room renters and second, leasers. Collecting usability test results and gathering insights from interview were also set as important meeting goals.

First meeting was held on 26.4.2012 (personal communication) with a female participant from Helsinki who has reserved meeting rooms several times in a year. Purpose of the first meeting was to test live demo and mockups with simple task such as "find a room" and "book this room". Test also included set of interview questions regarding participant's experience with meeting rooms. Second meeting was held with a female participant from Tallinn (personal communication 29.8.2012), who operates a business incubator with rentable hot desks and meeting rooms. In addition to tasks tested in the first meeting, few additional high fidelity (hi-fi) views of leaser's room management were tested. Results of both of these meetings were shared in a GoogleDoc summary document and discussed with the team. Test results were left outside this research since another set of usability tests and interviews was done in November 2012.

3.1.3.4 Live demo

Final product of the Demo phase was a live demo, designed by V. Gasik and developed by K. Vaher, published at Aalto University's ACE's "Aalto Startups in MoA" event on 14.5.2012 in Helsinki, Finland. Figure 3-7 shows a screenshot of this live demo. Live demo published in May 2012 included views for e.g. landing page, search and room profiles. It was concerned to be a Minimum Viable Product, useful for future development as well as upcoming interviews and usability tests with renters.

Table 3-3 outlines some of the methods and approaches used during demo phase. It could be noted, that demo stage had less major strategic changes than two previous ones – instead many new questions were formulated. Some of the questions were related to momentary experience – contextual, direct and even binary, for instance "would user like to see availability of the room based on selected time range such as 10-12 or inserted number of total hours, like 2". These questions were manageable with logic or peer's comments. Others were more abstract and related to user experience in much broader sense. These were for instance:

- How connecting to Roomforit.com will affect workday of the leaser?
- What extra arrangements have to be made?
- Is there something crucial that is not taken into account in users' view?
- Are leasers willing to trust a service like this?
- Are they keen to give up the service they are using now? (Personal blog post 16.2.2012).

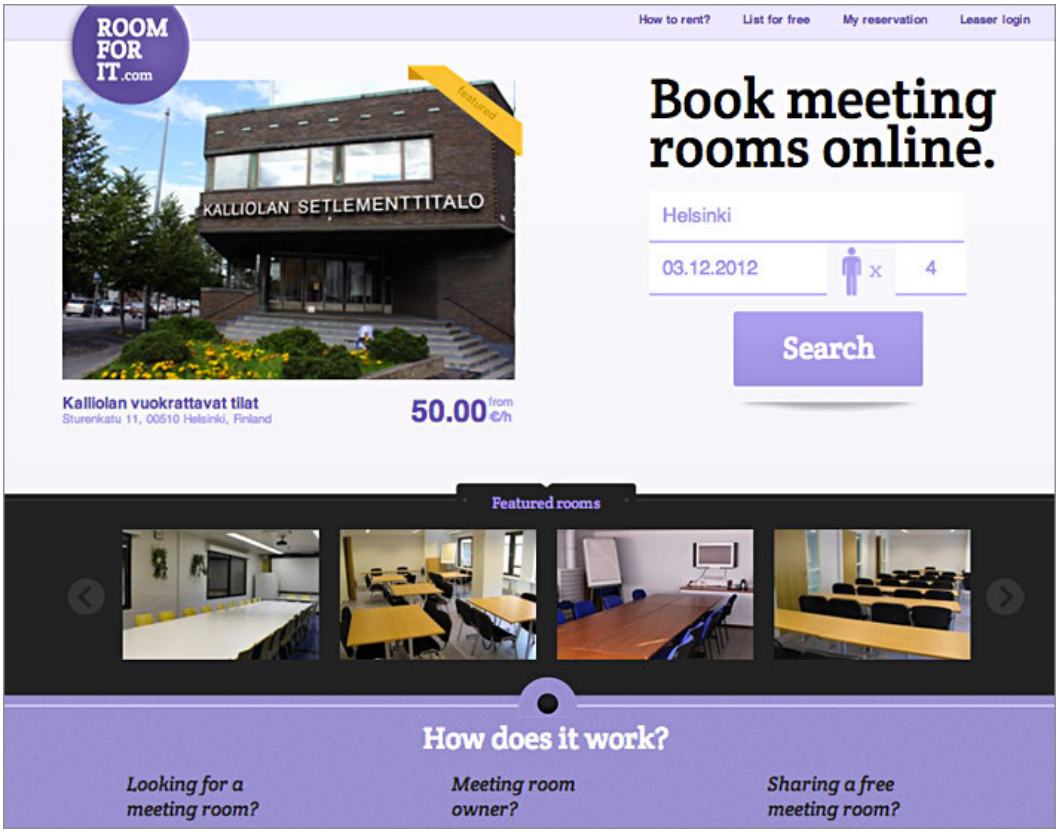

Figure 3-7. A screenshot from a homepage of a live demo. (2012). Retrieved from http://demo.roomforit.com.

Live demo, a first MVP of the service, expressed well ideas regarding service concept: it showed structure, identity and the basic functions of the service. However, demo missed views that were required for performing a real room booking process. It also lacked layouts that were needed for leaser's to operate with the service: adding a room, managing rooms and managing reservation. Thus, in the eyes of the designer, testing demo would not answer interesting questions and would fail to provide valuable metrics.

From the perspective of Lean startup methods, it could be argued that demo did not fulfill its purpose, since there was no learning and measuring loop that would include talking to clients or observing direct usage of the service. In other words, designing demo could be considered to be a waste. Such argument could be discussed. Creation of demo was not done in vain, since it gathered positive attention. After publication in May, a project manager and marketer were included in the project (personal communication, "Team" 7.9.2012). Subsequently it also worked well as a conversation opener and a reference for e.g. requiting usability test and interview participants. All of those six persons who were contacted and asked to participate in usability studies, accepted invitation and expressed positive comments about the demo (personal communication 19.11.2012, 21.11.2012, 30.11.2012, 3.12.2012).

Table 3-3. Summary of methods and approaches in Concept phase. Dates in the table refer to posts in the private research blog (personal communication).

Method/approach	Purpose	Result
Thinking aloud (e.g. 8.12.2011)	To get initial understanding of which room management actions are crucial and which less relevant by putting oneself in the position of a user by speaking out loud.	• Ideas for MVP views • Rough understanding what might be 'waste' is the demo and first prototype
Design analysis (e.g. 8.12.2011; 27.12.2011, 28.12.2011, 14.2.2012)	To analyze in details how competitors have solved certain design challenges, such as process for adding new room to the application.	• Design references • Examples of bad design
Sketches and wireframes (e.g. 27.12.2011)	To experiment with various design possibilities for high fidelity (hi-fi) prototype; to understand what to include in hi-fi prototype; to gather feedback.	• Various design options • Ideas for "delightful" design • Visual references for hi-fi design and strategic decisions
Service observation (27.12.2011)	To inspect real life service (Verkkokauppa shop) and to understand what could be done better in iRent.	• Positive UX ideas for iRent: • Direct booking, no waiting • Avoiding brand over-exposure • Keeping renter's goals and questions as a priority
Medium fidelity prototypes (3.1.2012)	To compose an interactive visualization of main views of room management.	• Mockups
Expert and in-team feedback (e.g. 3.1.2012, 5.1.2012, 16.2.2012, 14.3.2012)	To get fresh comments and feedback on contextual issues, such as certain design views and their logic	• Help for decision making • Suggestions for the future
High fidelity views (2012)	To create visual, credible views for live demo.	• Visual views for development • Base for visual identity
Visual research (23.4.2012)	To analyze competitors brands and visual identity.	• Logo analysis • Service 'personality' matrix • New logo design • Ideas for brand positioning
Tests of scripted usability tests and interviews (24.6.2012; 29.8.2012)	To understand how to carry out usability tests and interviews: to gather comments and insights on the service and to measure site's usability	• Knowledge about testing • Comment summary • List of possible bottlenecks in the service • Ideas for the "wishlist"

3.1.4 Prototype

Although demo was a viable artifact of the research, the prototype phase that followed after demo publication in May 2012 and continued until recently, is next briefly introduced. Communication with participants in November and December 2012 was based on both, live demo and its updated design as well as missing mockup views, created during prototype phase.

Designer's work during prototype phase was supported with various interaction design approaches, most notable paper sketches, wireframes and state transition diagrams. Simple notes expressed on a whiteboard during weekend development sessions (e.g.21–22.7.2012; 1–2.9.2012; 29–30.9.2012; 20–21.10.2012) worked especially well as development references, improved communication between team members and sped up design process. Figure 3-8 shows an example of whiteboard notes, drawn on 1.9.2012.

At best, drawings accompanied with simply expressing concerns regarding certain details out loud, led to vivid conversation regarding user experience and usage flow, spotting possible bottlenecks or design pitfalls and even positive pivotal changes. One of the most significant changes was a realization regarding service's incorrect position and role (personal communication, notes from weekend meeting with T. Tammemäe & K. Vaher, 21–22.7.2012).

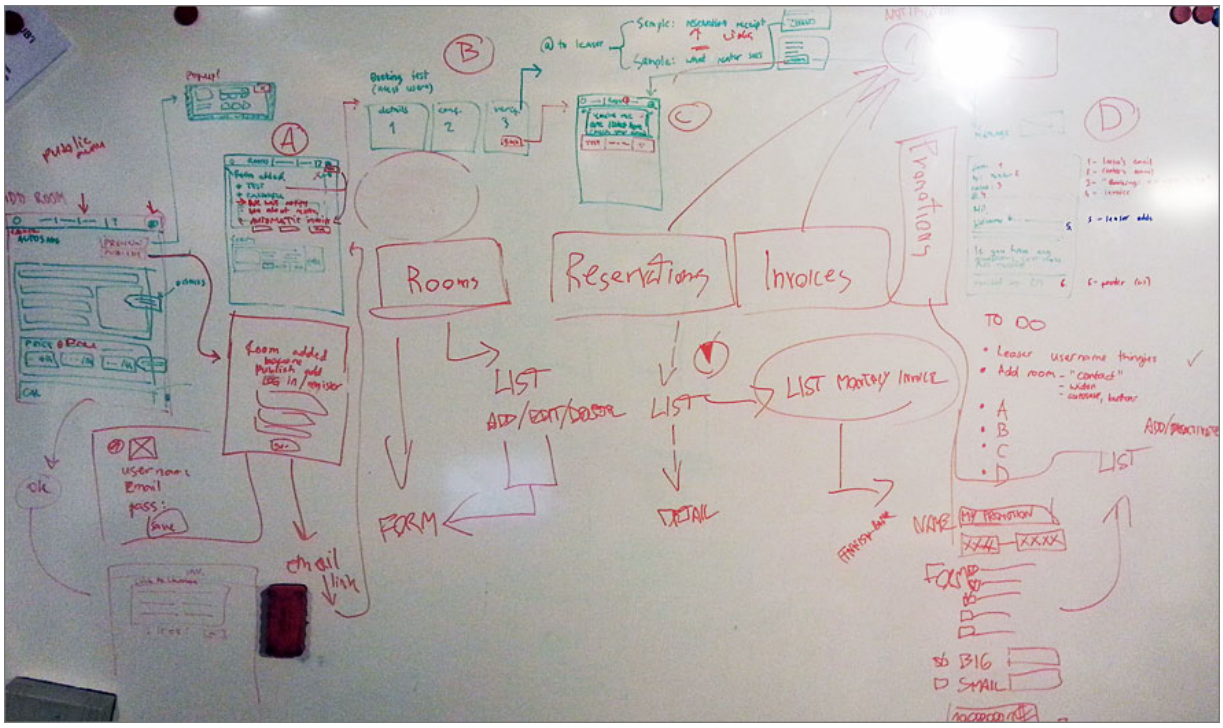

Figure 3-8. Whiteboard notes from a Roomforit.com team meating. (Personal blog post, 1.9.2012).

Long discussion regarding complexity of reservation of extra service reservations such as catering and inconvenient hassle with possible changes, cancellations and reclamations led to the idea that instead of being an agent or a middleman, Roomforit.com service should be an almost invisible platform supporting means of communication and providing as much freedom for leasers and renters as possible. Until this realization, service aimed to cover every possible scenario from wrong orders of coffee, missing people in the meeting to total no-shows.

With this coverage, service unintentionally interrupted natural conversation between leaser and renter by almost forcing them to communicate through the service. It was discovered that instead Roomforit.com should aim for positive user experience by serving well the most certain and currently most poorly organized detail of the process – simply reserving the room. Based on renter's wishes and real situations, leaser should be able to easily modify details such as amount of people in the meeting or extras like sauna or catering. An extract from meeting documentation (personal communication, Google Document, 22.7.2011):

> "We decided to simplify our service. Payment will be ditched from booking process. Client will not pay for room with credit cards. The leaser will select whether it would like to a) send an invoice through RFI [Roomforit.com] or b) send his own invoice. RFI will bill leaser through the system – either on monthly bases or after certain amount."

Smaller example of pivotal decisions occurred during another weekend meeting at Garage48 Hub in Tallinn (personal communication with V. K. Vaher & T. Tammemäe, 1.9–2.9.2012). After inconclusive experimenting with layout elements, designer expressed discontent with a small field in the "Add new room" view. Simple question, hidden in the midst of a scaffolding form, was perceived important since it was directly related to service's revenue model. In this field, leaser's billing information was asked – it was needed for creating reservation summaries for renters and generating commission invoices from Roomforit.com. As this field placement felt "unnatural", after another vivid concersation it was agreed to hide it at the end of the "Add new room" process. It was decided to make "Add room" page public so anyone could easily see how they facility would look like in the Roomforit.com listing, before joining and giving such private payment details to the service.

3.1.4.1 Towards Prototype MVP

In order to make second testable Minimum Viable Product, it was agreed that only the most important views should be included – these were actions that were directly related to room management, reservation and booking process. Through rationalization, layouts that were important for business, such as commission invoicing were put second in prioritization. Everything else was seen insignificant. (Personal communication with T. Tammemäe & K. Vaher, 21–22.7.2012).

In practice, designing out unimportant features and views as well as fully concentrating on rapid production of the most significant parts, turned out to be challenging. Based on notes in private blog (2012), shared meeting summaries in Google Drive and personal NotePad document

remarks this could be explained with additional elements and work that was hard to skip. This included e.g. copywriting, translation, iconography and designing the booking calendar.

Copywriting included producing simple body text, simple marketing messages, help sections, "Media" and "About" pages as well as legal documents, such as Terms of Service and Registry Information. Since service Roomforit.com had a localized Finnish version named "Kokoushuone.com", translation of all copy in live demo from English to Finnish was necessary. Translation was not however made for Photoshop prototype layouts as they were used for communication with the team.

Iconography included illustrating and testing service icons such as pictures for coffee, catering, sauna and wi-fi availability that would be unambiguous and work well in multiple colors and sizes. Designing exception calendar was especially difficult and required several views. Figure 3-9 presents one of the initial designs and a final design version, modified after feedback from peers and colleagues (30.9.2012). In the first version (30.9.2012) exception calendar was combined with opening hours and prices. In the final view (10.10.2012), calendar was moved to its own page and was supported with color-coding and a legend. Last standalone version without opening hours and prices was considered to be simpler. This assumption was tested in three Leaser's usability tests (30.11.2012, 3.12.2012).

In terms of Lean startup principles, one could argue that all of these elements were waste. Translation could be skipped, copy replaced with dummy text and iconography borrowed. Exception calendar could be substituted with ready interactive template. These options were considered but in the light of designing for good user experience it was thought that testing calendar templates and dummy text would not provide interesting results as in the long run it would require the next test round, which also requires additional efforts. It was already previously regarded that in order to differentiate, prototype should be perceived to be not only usable but also desirable. In terms of this project, desirability was connected to creating distinguishing identity from the beginning.

By the end of November 2012, views for clickable mockup were finished. The most important questions that required feedback from real room owners related to adding the room to the service, managing calendar exceptions and checking reservation.

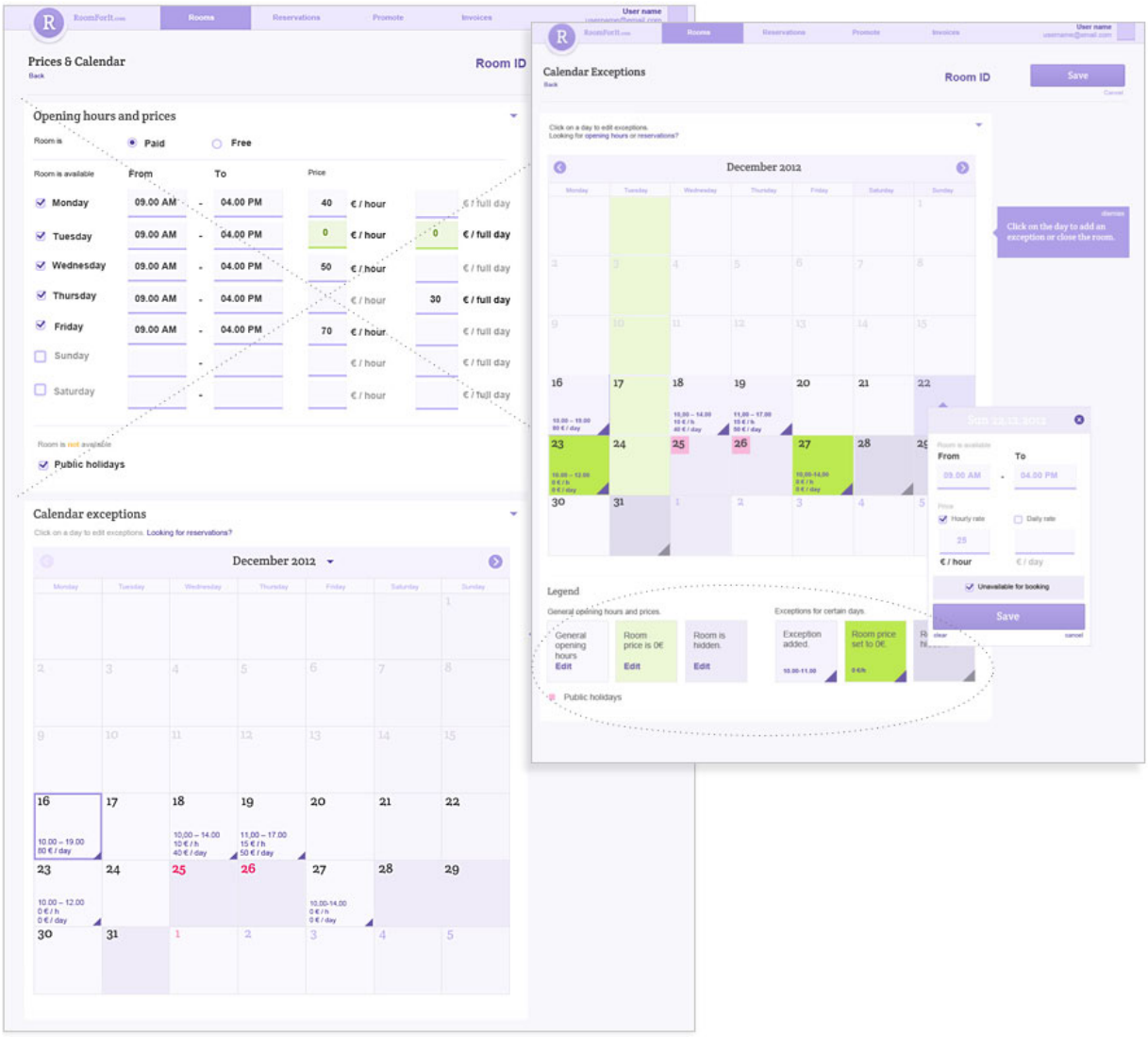

Figure 3-9. Two versions of a Roomforit.com leaser's management page and its calendar view. (Personal blog post 30.9.2012, 10.10.2012).

3.2 Results and analysis

Research hypotheses proposed that designing for user experience adds value to the service and that such design process could benefit from Lean principles. Observing direct usage and collecting feedback on user's experience is seen as one of the main evaluation methods of service's Minimum Viable Product (MVP). In order to understand whether applying Lean principles and designing for positive UX was valuable, usability tests and interviews were organized.

The structure and metrics for these meetings were derived from findings discovered during design process. It was a matter of research to understand what intended positive user experience might mean in the context of the online service concept. In the beginning, service UX goals were closely related to usefulness of the service and good usability – in other words, overall attractiveness of the service as well as efficient completion of important tasks. After identity design phase, goals were broaden: design was intended to be delightful and perceived as for instance fresh, modern, credible, light, distinguishable, friendly and helpful. Finally, it was concluded that such attributes were positive and helpful for design orientation but fortuitous and trivial in the light of evaluating the overall success of online service concept and its perceived value.

Practical design indicated that desirability of the service would be tightly connected to good experience of the core community. In other words, in an order for this online meeting room booking service to be valuable, both room renters and room leasers should have equally positive (matched) user experience. For this potential service users from both groups were contacted.

This chapter discusses results collected from six usability tests and interview meetings, held in November-December 2012. Meetings consisted of usability tests, interviews and answering survey, which was conducted with AttrakDiff tool (2012). This chapter explains purpose and structure of these meetings, describes tools used for documentation, reflects on possible test biases and concludes with presenting results and analysis of usability tests and surveys.

3.2.1 Structure and tools

Six one-on-one meetings took place. Each individual meeting included a scripted usability test with three tasks, brief interview with up to ten questions and an AttrakDiff survey (2012). For interview and test sessions, two different templates were created (Appendices E1 and E2) – one for room renters and another for room leasers. Templates were similar in structure but had varying focus in tasks and questions. In addition, two identical AttrakDiff surveys were opened.

Meetings were referred to as "Renter's test" and "Leaser's test". In project's context, renter is a person who books a room and a leaser is the owner of the room, which is listed in the service and is rented out. On practical level, purpose of this division was to test different service activities. On more broad level, the research was interested in similarities and differences between leaser's and renter's overall user experiences.

Test structure, content and used tools are summarized in Table 3-4. Figure 3-10 shows a screenshot from one of the test recordings done with Screenium tool.

Table 3-4. Project evaluation with renters and leasers. Meeting structure, content and used tools.

	Renter's test	**Leaser's test**
Presented views	Live demo, clickable mockup (http://invis.io/7U8ZJ7EQ)	Live demo, clickable mockup (http://invis.io/D59EZSSF)
Assessed views	Live demo, clickable mockup	Clickable mockup
Scripts	Appendix E1	Appendix E2
Recoding tools	Screenium	Screenium
Language	R1, R3 in English; R2 in Finnish	L1, L2, L3 in Finnish
	Structure	
1. Introduction	Describing service briefly.	Describing service briefly, showing demo.
2. Usability test Tasks	1. Find a meeting room in Helsinki with sauna. (live demo) 2. Get familiar with room's details and location on the map. (live demo) 3. "Book" the room (mockup)	1. Add new room to the service 2. Change price and opening hours on the 22nd of December 3. Check details for reservation on the 28th of October.
3. Interview	*Outside inspection.* Questions were related to habits of meeting room booking, used tools, bad and good experiences and interest to book and pay for rooms online.	*Outside inspection.* Questions were related to habits of meeting room leasing, used tools, bad and good experiences with current solutions and interest to manage booking online.
4. Survey	AttrakDiff (2012): RFI User Test Single Evaluation (http://bit.ly/11ObzKu)	AttrakDiff (2012): RFI User Test - Leasers Single Evaluation (http://bit.ly/R4USd1)

The participants were selected outside Roomforit.com team and circle of service's partners and advisers. Recruitment was carried out via social media, e-mails, phone calls and face-to-face discussions. Some experience in either renting or leasing meeting rooms was expected but no other strict selection criteria were set. Renter's tests took place between 19.11–21.11.2012 and Leaser's tests between 30.11–3.12.2012. First three participants – R1, R2, R3 – partook in session for renters and three others, L1, L2 and L3, in session designed for meeting room leasers. On average, a meeting took approximately 40 minutes. One person carried out these tests.

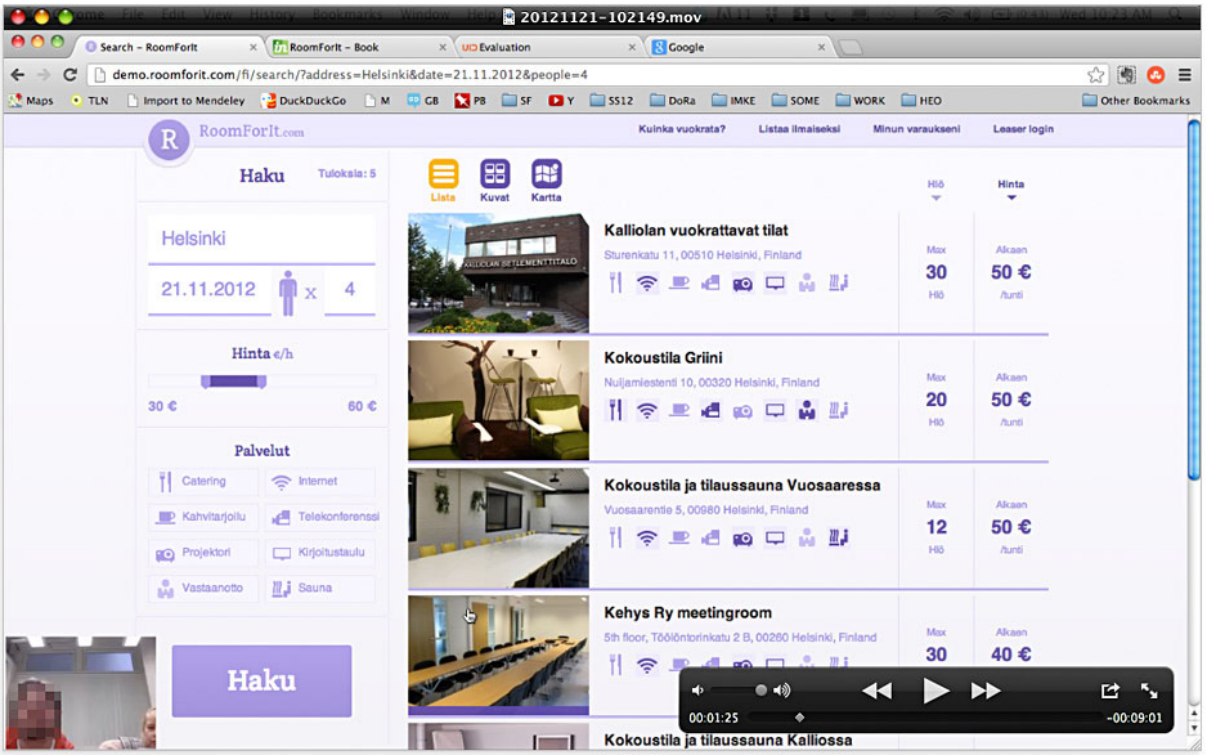

Figure 3-10. A screenshot from usability test recording. (Personal communication, 21.11.2012).

Renter's test concentrated on the live demo combined with mockup views of a simple booking process (http://invis.io/7U8ZJ7EQ). Leaser's test was based on clickable mockup (http://invis.io/D59EZSSF) created during prototype phase. Both clickable mockups were created in Adobe Photoshop and assembled in online service Invisionapp.com (2012). It should be noted that experimental tests carried out in April 2012 and August 2012 (personal communication) reviled that operating with clickable mockups might cause bewilderment since they do not react to user's every click and are not fully interactive. Because of this, participants were encouraged to say out loud what they would click or point to the screen first.

Interview questions included demographical information, contextual questions linked to room renting or leasing as well as subtle marketing inquires like [as a renter] "If it would be easy, would you manage meeting rooms online" and [as a leaser] "If it would be possible, would you like to receive payments online". Although Krug (2002) did not suggest to mix usability testing with anything else, from project's perspective missing opportunity to talk to clients face to face felt like a waste of resources.

3.2.2 Test biases

Qualitative research results are usually biased. Validity of results can be discussed based on among others these aspects (e.g. Sauro, 2012; Krug, 2006):

- Hawthorne Effect: participant changes behavior because he or she is observed.
- Task-Selection Bias: user expects that provided tasks are always solvable.
- Primacy Effect: participant is performing worse with initial tasks.
- Too many hats: one person, instead of two or more, operated meetings.
- Leading questions: interview's last three questions were intentionally leading for marketing purposes.
- Varying difficulty level in usability test tasks for renters and leasers.

Most of these problems were acknowledged. Conducting test alone was balanced with recording both, screen and discussion, and practicing conducting usability tests and interviews beforehand. Using screen recorder with web camera and microphone also prevented problems with note taking. Some users find cameras and note taking disturbing. Screenium -application was set in the background and was quickly forgotten by users. When the user was answering the survey, interviewer turned away or stepped out of the room – but not too far, so if any of the word pairs was unclear, she could translate them quickly.

Relax attitude and chitchat in the beginning was aimed for reducing Hawthorne Effect – though, observing recordings afterwards revealed that there is still some room for improvement. Overcoming Task-Selection Bias was approached with following Krug's (2012) usability test script and assuring users that incomplete tasks were acceptable. While brief introduction of the service by the test conducter was against Krug's (2006) script, it was used to prevent primacy effects. It was intended that users get initial understanding about the service that is being observed. For instance, before diving into first Leaser's task "Add a room to the service", main service idea was explained and live demo shown to the participant in order to reduce the learning curve. This was rationalized with a thought that in real life it is highly unlikely that a room owner would list his facility for rent in some service without looking around the website first.

Most participants expressed contentment with the sessions and found it interesting. One participant pointed out that some of the word pairs in AttrakDiff survey sounded like domain jargon and were hard to understand.

Another bias was noted with one of the participant, who had difficulties with navigating in a static mockup instead of a live website. Participant said that is was challenging to make decisions without typical interaction clues such as change in color text or cursor. These comments might have been bypassed as underachievement that tends to occur when testing with mockups in scripted test session. From design point of view, such effect should not though be viewed as an

excuse: in this case, navigation problems pointed out that information visualization could be generally improved. Clickable, static and unavailable elements should be discoverable without interactive feedback.

Since interview questions were mostly concerning marketing and service design issues and three of the ten questions were leading, their analysis is left outside this research.

3.2.3 Results and analysis of usability test

Ries (2011, 144–146) proposed that in the light of Lean, selected metrics for validated learning should be closely related to each assumptions: they should express cause and effect and be easy to understand. These guidelines were used for summarizing results from Renter's usability test (Table 3-5) and Leaser's usability test (Table 3-6). Evaluation scale, results and few selected discoveries from usability tests are described below.

Task completion was expressed in a scale of four assessments: easy, difficult, struggle and fail. In this project, easy referred for completing task without any problems, difficult if some insecurity occurred but task was completed without assistance, struggle if there were major slow downs, and fail, if task was not completed. Occasionally, such usability test results are expressed in binary mode – task was either completed or not. In this evaluation, due to test bias related to using static mockups and interest towards root causes behind possible obstacles, two more descriptive assessment words were included. Another commonly used metric, time of completing task, was also passed. This solution was rationalized with small number of participants and curiosity of user experience in broader terms.

Table 3-5. Renters' usability test summary.

Participants	Task 1	Task 2	Task 3
R1, female Age from 20 to 40	Struggle Got lost when clicked on "How to rent" link. Started over.	Easy	Fail Completed booking process without adding extra services.
R2, male Age from 20 to 40	Difficult Wondered for a while how to begin. Found coloring of service icons confusing.	Fail Expected to see a map when clicked on the address.	Difficult Was confused with colors: thought grey mean unavailable.
R3, male Age from 40 to 60	Easy	Easy	Easy

In Renter's test, R1 and R3 had fair experience with computers and usage of internet; R2 was a professional in interaction design. Test result pointed out curious variety in users' experiences.

Participant R3 had no problems accomplishing all tasks, while R1 and R2 struggled. All participants completed reservation process rather quickly, R1 even too quickly – she was surprised to hear that her room order was already placed. When asked, she could not put her mind on the details of her booking. Interestingly, all participants commented that booking process was too smooth and simple – they expected to see more delays, similar to verifications in online banking.

After completing Task 3, participants were casually asked what would they do if something would need to be changed in their room booking. Without reading, R1 and R2 pointed to a small link in a green confirmation bar that would resend reservation summary to the user's email. R3 clicked on "My Reservations" in the top bar.

Table 3-6. Leasers' usability test summary.

Participants	Task 1	Task 2	Task 3
L1, male Age from 40 to 60	Difficult Paused to wonder about "Paid/Free" radio button and "Public Holidays" checkbox	Difficult Clicked on "Prices and Opening hours"; when pointed to Exceptions, completed task easily	Easy
L2, male Age from 20 to 40	Easy	Difficult Same as L1	Easy
L3, female Age from 20 to 40	Struggle Paused to wonder about calendar, service and "paid/free" radio buttons.	Difficult Same as L1	Easy

In Leaser's test, L1 and L3 had strong experience with room leasing and management – both used internal booking systems on daily basis. L2 had some knowledge but he did not use any systematic booking calendar, instead he preferred reservation via phone, email and social media. All participants had good know-how about using internet and computers.

In the first task, all three participants had a positive first impression of the "Add room view" but when studied closely, found few puzzling questions that generated some discussion. L1 thought that in overall, the form was simple and for most parts, as he mentioned, "familiar from Facebook". He paused briefly at "Paid" and "Free" radio buttons and "Public Holidays" check box, which he found little confusing. L2 saw that the form in "Add a room" page had all needed fields, expect that he was expecting to see "House rules" -form under the tagline. L3 felt insecure about opening hours and extras in terms of real rooms she managed. L3 wondered out loud how could synchronize with her internal room calendar and how to connect various extras to services provided by third parties.

Task 2 was fairly easy for all, although all three would have clicked on "Prices and Opening Hours" link first. When pointed to "Calendar Exceptions", everyone completed task quickly and successfully. Also Task 3 was simple for everyone. L1 suggested having a possibility to add personal notes for each reservation, for instance if someone forgets something in the meeting room. In the context of third task, L3 asked if she could easily add reservations that are made outside the service. She added that this would be crucial for her, if she would be considering switching room management from internal calendar to any online booking service.

During usability test and interviews, it became clear that leasers who managed more than one room (R1, R3) wanted more options. For example, both suggested showing different room capacities for various table formations: for example "theater - 50 seats" and "U-table - 20 seats". R3 also proposed to show room's square meters in the search and room profile views. All three renters expressed small contextual improvement ideas such as possibility to promote new room in social media right after its publication.

Both usability test sets concluded in rather positive feedback. In comparison to Renter's test, problems occurred in Leaser's test were more uniform and clear, e.g. semantics such as "paid" and "free", unclear link for "Calendar Exceptions" and missing elements such as connecting seats to table forms. Most surprising discovery related to room booking process in Renter's test. All participants expressed that in their opinion booking process was too smooth and fast: they were accustomed with services that asks for more attention right before verifying an order. Overall, 2 incomplete tasks out of 18 indicated that there were only few critical bottlenecks and pitfalls in the design. These problems were not considered severe in terms of time and resources needed for redesign.

3.2.4 AttrakDiff survey results and analysis

AttrakDiff (2012) survey was selected to support usability tests and present another perspective in Roomforit.com evaluation. AttrakDiff (2012) is a a free online survey and evaluation instrument aimed for measuring attractiveness of the service in terms of usability and appearance as well as for finding points for improvement. It was created with collaboration of User Interface Design GmbH and M. Hassenzahl (AttrakDiff, 2012). For this research Single Evaluation survey was selected. It included a set of 28 pairs of opposite adjectives from four categories, seven in each. Pragmatic Quality was related to usability. Hedonic Quality – Stimulation indicated service's ability to support e.g. growth, interest and development. Hedonic Quality – Identity pointed out to what extent user identified with the service. Last dimension Attractiveness described overall

quality perception of the service. Participants were asked to spontaneously rate all 28 word-pair extremes on the scale of seven points.

AttrakDiff results were concluded in Figure 3-11. It should be noted that sample presented in this research is not large enough for proper statistical evaluation, thus these figures are included particularly for visualization purposes. Figure 3-11 showed that there is some difference in perceived quality among renters and leasers. In summary, service was "rather desired" in the first case and "fairly practice oriented" in second. Visualization however does not reveal whether this difference is positive or negative.

Figure 3-12 shows the distribution of the same answers in the word pair survey. Color bars near the word pairs indicate the category to which these words belong.

Was leaser's high rating on the word "undemanding" a negative prospect? Especially puzzling results related to attractiveness of the service. Renters considered Roomforit.com quite attractive and fairly appealing. Leasers were less positive about both attributes but rated "likeable" higher than renters.

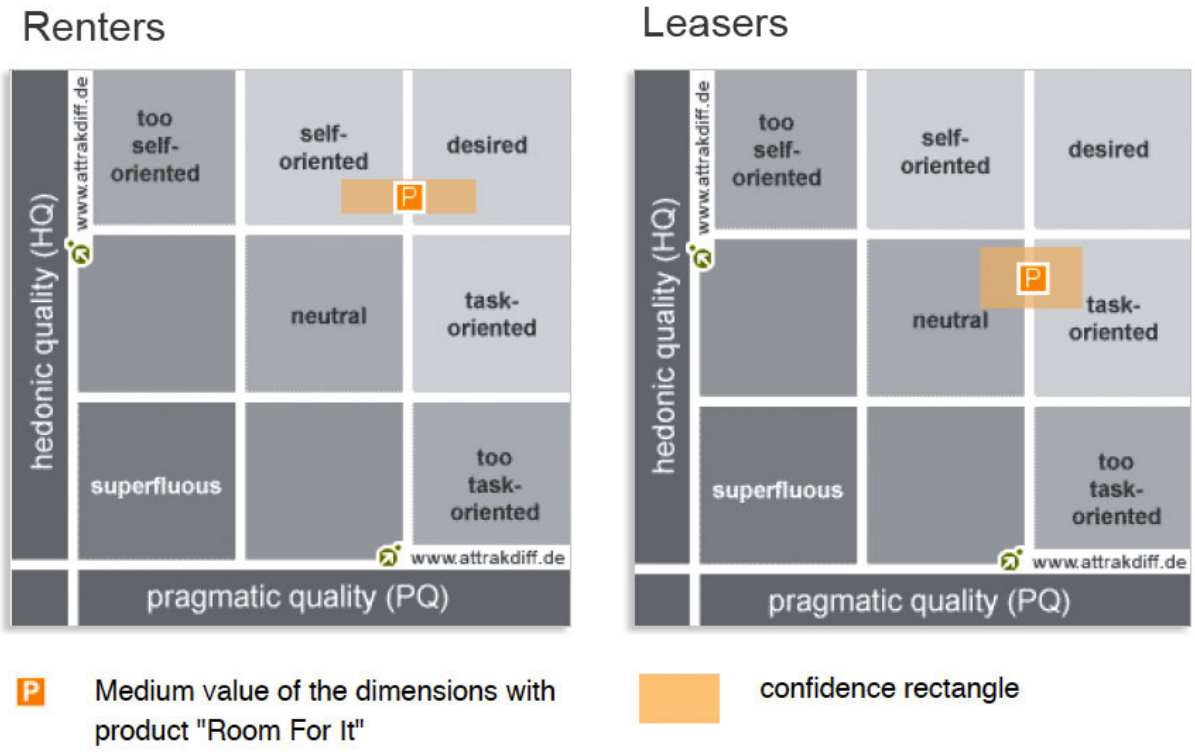

Figure 3-11. Portfolio presentation of two AttrakDiff survey results.

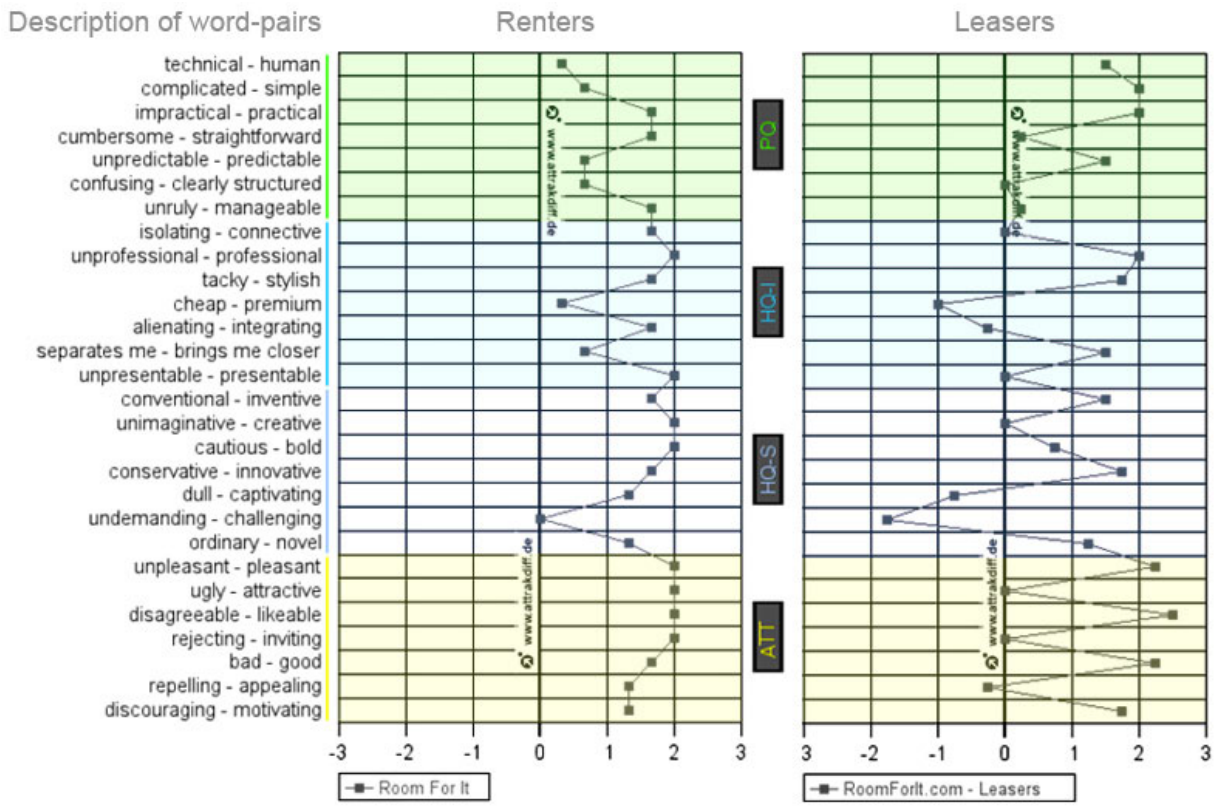

Figure 3-12. Comparison of results from two AttrakDiff word-pair surveys. Color bars near the word pairs indicate related categories (from the top: pragmatic quality, hedoniq qualitiy – identity, hedonic quality – stimulation and attractiveness).

3.2.5 Research Evaluation with UX Match Matrix

Comparing word-pairs was cumbersome – visualizations showed many data-points but not their overlap. For more detailed observation Figure 3-12 was translated to numeric data, the ratings were normalized (Appendix F) and converted to percentages (i.e. the minimal score -3 in Fig. 3-12 becomes 0% and the maximal score +3 becomes 100%). Instead of correlating every pair of each criteria, they were grouped into four categories (pragmatic quality, hedonic quality - identity, hedonic quality - stimulation and attractiveness). In addition, the mean value and standard deviation for each of four categories were calculated. Based on this data, Figure 3-13 was combined. In a same manner as with results form AttrakDiff, due to small sample of answers these calculations were created for visualization purposes.

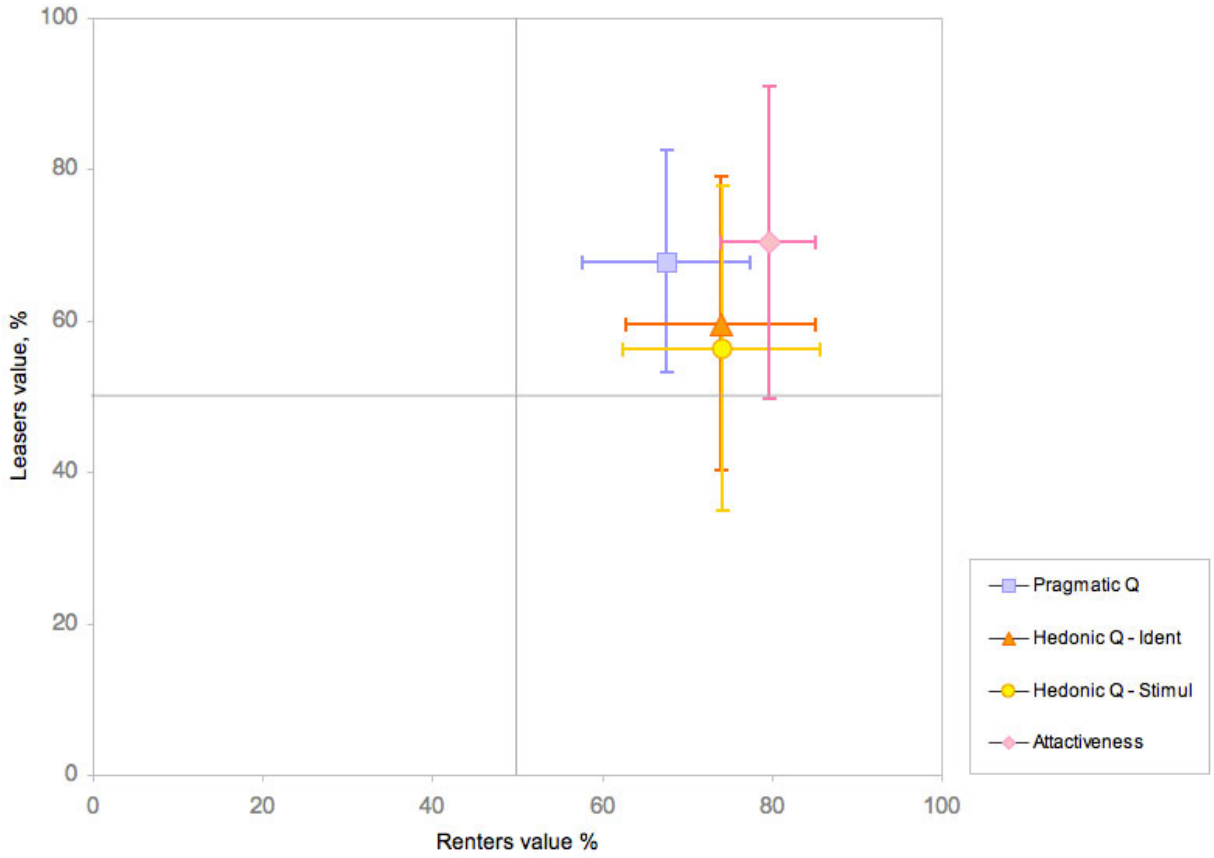

Figure 3-13. Comparison of perceived service quality values by renters and leasers. Error bars indicates standard deviation within the category.

Figure 3-13 shows a comparison between renter's and leaser's results. In the figure, central object indicated category mean values, and cross lines – standard deviations. Figure reveals a clearer clustering of the answers. Figures were grouped closer to top right corner, which indicated that only few negative assessments were made within both groups.

What conclusions could be drawn? The success rate of intended Roomforit.com service value – equally positive user experience among both renters and leasers – depends on the level of assessment. Usability test results reflected upon specific design issues and gave rather practical answers but did not tell whether users for instance found service more appealing. When individual attributes were inspected, the feedback gave valuable insights but the range of answers was too scattered for comparison. Based on the literature, such diversity was expected – user experience is dynamic and subjective.

Combining and comparing survey results gave the most globally applicable considerations. Clustered data in Figure 3-13 suggest a "position" for the community perception. In the figure 3-13, attractiveness of the service could be witnessed: all mean results are positive, although some of leaser's answers overlap the desired "UX match" area. Nevertheless, such presentation

indicates that service concept created with Lean principles is on the right path. If cluster would be positioned for instance in the bottom left corner, it could be said that participants experience was overall quite poor and design of the concept would have failed. Based on this idea, an additional evaluation method for UX comparison is suggested in Figure 3-14.

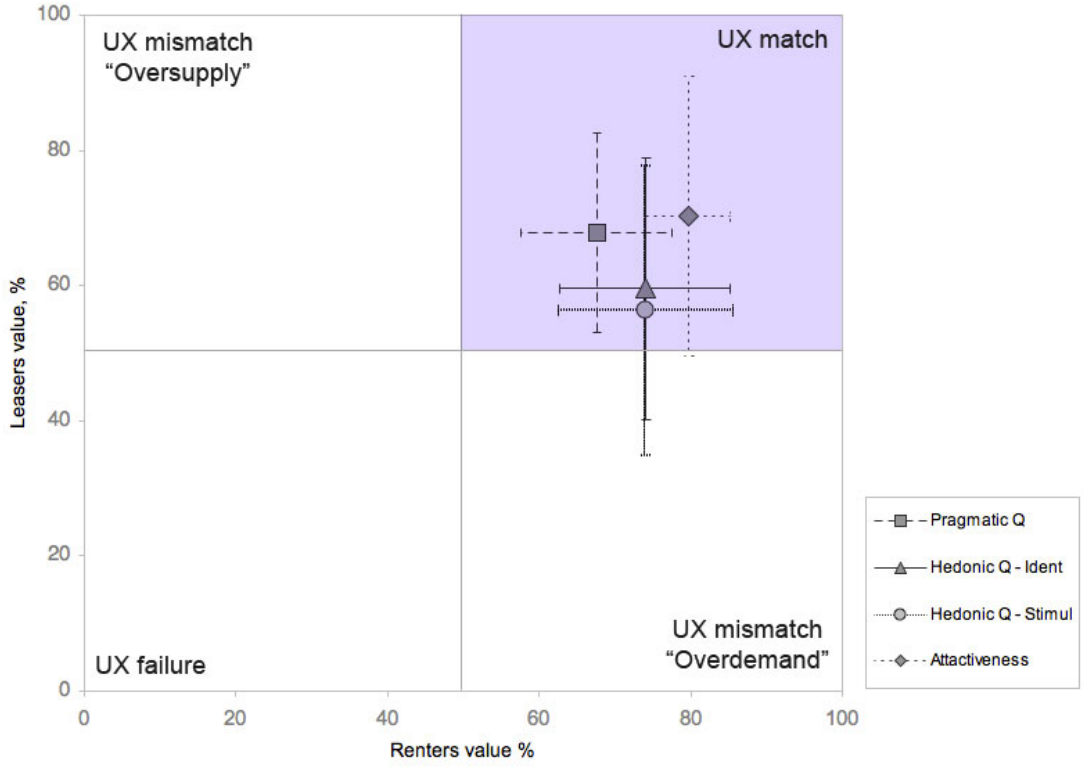

Figure 3-14. Comparison of perceived service value by renters and leasers. The filled square (UX match) means both 'sellers" and 'buyers' would likely to use the service in terms of all analyzed quality and attractiveness criteria.

Matrix is divided in four evaluation squares with following labels: UX match, UX failure and two UX mismatches – oversupply and over-demand. UX match is a desired state for a service, which targets two or more different but equally important user groups. If data points would gather in one of the two UX mismatch squares, it could be assumed that good user experience is perceived by only one group. For example in Roomforit.com case it could mean that room providers are happy with the service but renters dislike it and have negative user experience. If simplified: there would be a store full of products but no buyers.

3.3 Discussion

In the Introduction chapter, the scope of the thesis was narrowed down with two research questions regarding suitable approaches for designing for good user experience as well as ways in which Lean principles could support this process.

The initial research framework is reflected in Figure 3-15. Actual design is added in the graph in a form of a blunt cone. Its narrow shape inside Lean principle framework indicates that during the process some of the promising business opportunities (and with them, some UX factors) were left out by intention. For example idle and empty office spaces were excluded from the service. These decisions were aimed for creation of a Minimum Viable Product – a feasible artifact that could be tested and improved.

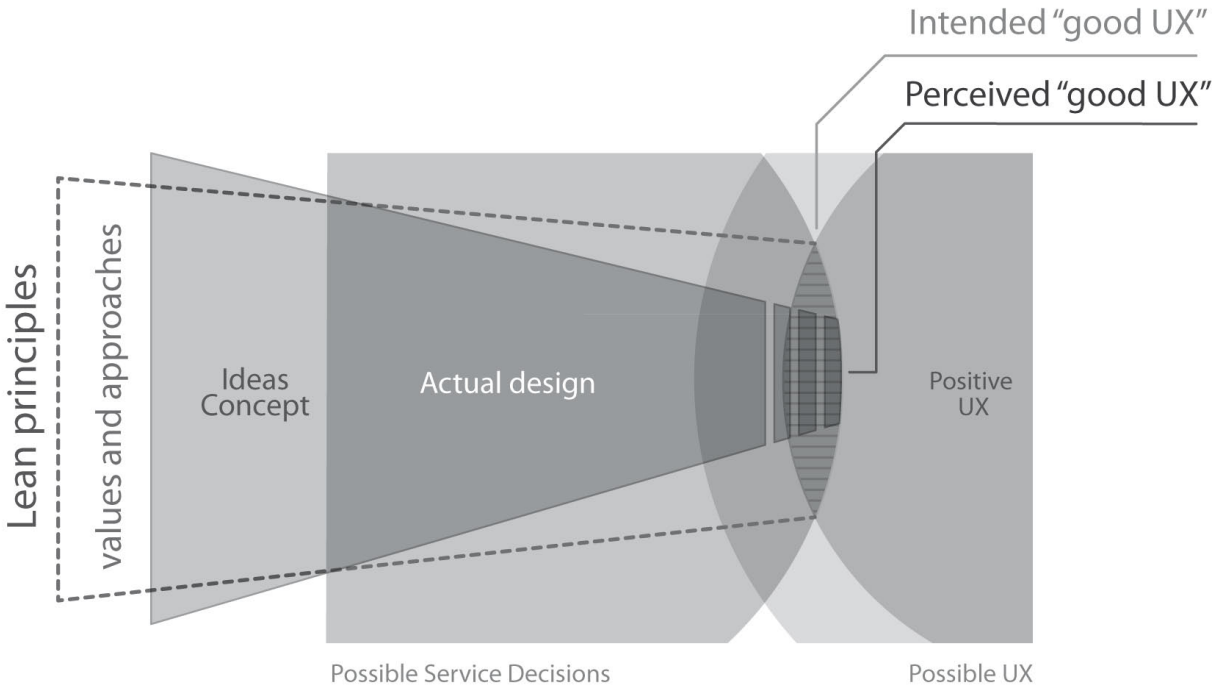

Figure 3-15. Reflection on the initial research framework: intended and actual design scope.

Ruled tip of the cone in the Figure 3-15 expresses a need for further development. While usability test results and UX Match Matrix showed evidence regarding overall positive experience, improvements and new evaluations have to be made in the future. For instance usability tests pointed out that there were no severe usability flaws, although participants were struggling with some of the tasks. Also some dispersion in AttrakDiff word pair survey results was witnessed i.e. leasers' answers were less unified than those of renters'. In addition, there was some discomfiture

in the survey semantics: for example results for words "undemanding" and "challenging" were dubious.

Nevertheless it was concluded that selected combination of UX approaches and using Lean principles has supported the positive outcome. Because both test groups had generally positive experience, it might be concluded that Roomforit.com concept was on the right track. This result leads to critical discussion about benefits of selected approaches as well as the role of Lean.

Figure 3-16 summarizes few frequently used approaches, most essential evaluation methods as well as products, data and ideas generated throughout the process. Graph is based on Lean startup's model of Build-Measure-Learn. Original figure is extended from a circle to a spiral form, which represents in more details the iteration process of project's main four phases.

In Roomforit.com project, most useful and used internal approaches to UX goals were benchmarking and competitor observation, sketching, written or orally communicated user actions, thinking out loud about design i.e. playing a role of a renter or a leaser in order to evaluate design choises as well as direct discussions with the team members. In-team feedback is also presented in Measure-section: direct discussion was usually related to some details of upcoming design, while feedback was closely connected to evaluation of design solutions that were already made.

External approaches that were done in a collaboration with people outside the team included gathering feedback from friends, peers, mentors and domain experts. As can be seen in the Figure 3-16, secondary data of unstructured and contextual feedback was collected frequently throughout the whole process. Real user feedback was collected based on live demo (MVP1) and prototype mockups (MVP 2). Experimenting with the first two scripted tests gave confidence in conducting meetings with test participants; they also served well for collecting the first direct feedback from potential Roomforit.com users.

While selected "toolkit" of approaches worked fine in the context of this project, some limitations should be acknowledged. Standalone, most of the approaches are quite weak: for instance relying on experts' opinions might only give professional perspective but not reveal the daily problems of regular users. It is viable to note that retrospective analysis based on the blog notes and memories might distort true impact of each approach at various stages. It should be also pointed that while Lean values were communicated to the team, one person did most of the work of "UX researcher" (Kuniavsky 2003, p. 60-69) – this had a limiting impact on the efficiency of the process.

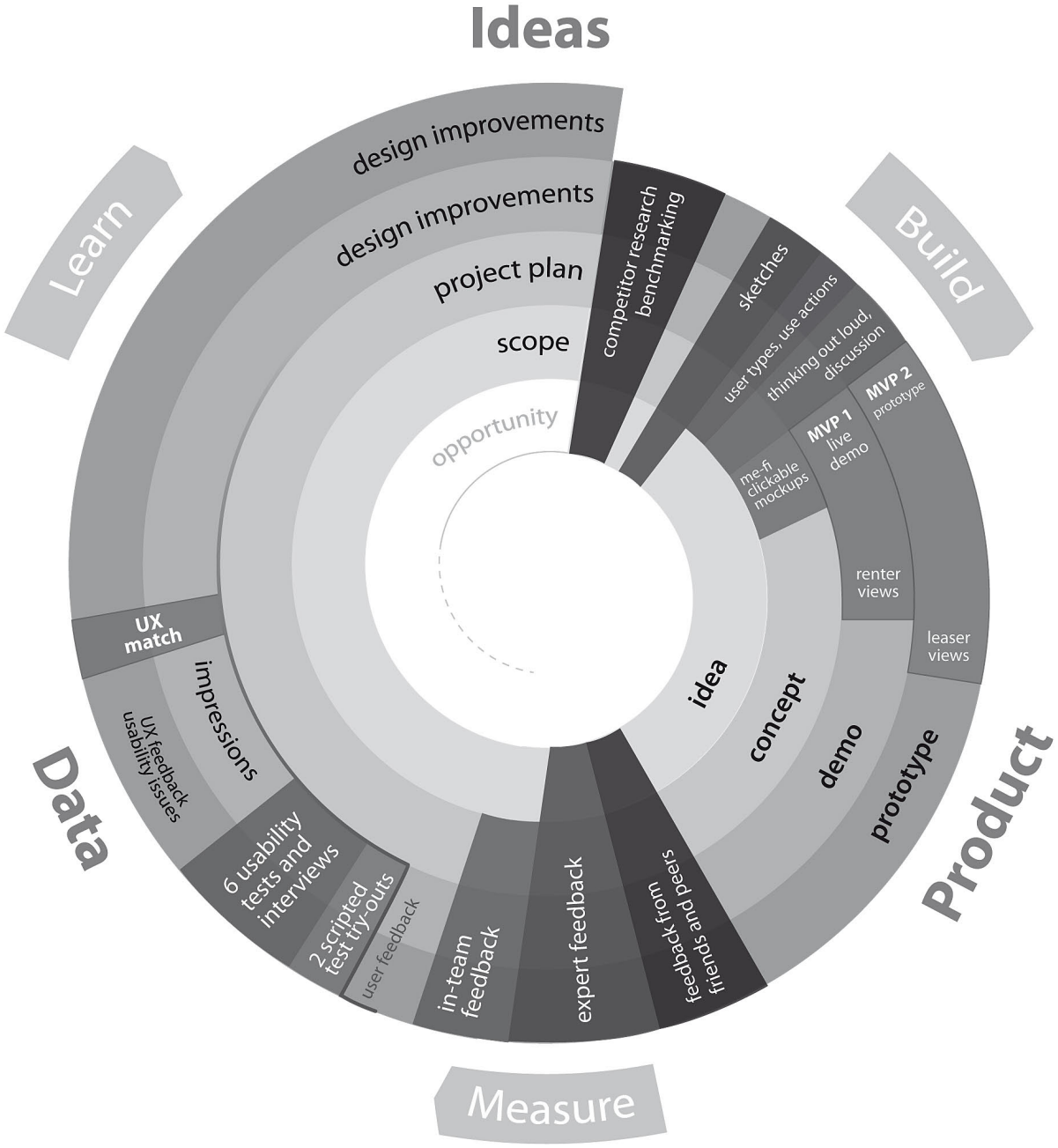

Figure 3-16. Roomforit.com project inspected through Build-Measure-Learn spiral.

Some of the design means visualized in the spiral Figure 3-16 might be debatable. For instance, "thinking out loud" approach (e.g. testing design ideas by playing a role of a renter or leaser and "walking through" various processes) was not mentioned in the literature and thus could be considered as not directly related to UX approaches or Lean principles. In terms of Lean, this could be discussed by looking on summarizing thoughts of Basu and Walton (2011, p.110) who noted that exact methods are less important than "observing the simple doctrine of achieving the elimination of waste." Also Seddon and O'Donovan (2009) pointed out that if some Lean approaches are not "listed" they should not be considerated irrelavant. In the perspective of UX,

e.g. Goodwin (2009, p. 59) proposed innovative UX evaluation methods during design process. Theather and drama as part of design process has been also discussed by experts in the neighboring field of service design (e.g. Jefferies, Tan and Yee, 2012; Grove and Fisk, 1992). During the project, talking out loud about design and discussing with the team gave many insight thoughts.

Some of the typical design methods, which are familiar from interaction design, e.g. describing personas and writing scenarios, were left out. It could be argued that not using personas had a negative impact on the service. This "deficiency" was, however, compensated with extensive use of other approaches aimed for understanding service users better, such as talking to mentors and peers, observing conversations in related channels, writing down user actions, drawing sketches and producing an abstract understanding of user archetypes by referring to main user types as "renters" and "leasers".

Lean startup principles strongly recommend rapid prototyping and reflecting the design with user feedback as early as possible. Rapid prototyping is familiar from Agile methods and interestingly, this recommendation seems to be a new addition to the original TPS. Real user feedback was collected only on high fidelity mockups and live demo, not earlier. It was rationalized that secondary data was enough for the first concept and design phases. Meeting rooms booking service Roomforit.com resembles services for booking hotels, flights, movie tickets, gym facilities and so one – a process familiar to many. In this sense, a general assessment and worthy feedback could be given by many non-professionals.

Third rationalization was rather paradoxical and likely most debatable. Gathered information indicated that some people working with booking systems were quite frustrated with them. Introducing and testing raw ideas with poor visual representation of a product that has already been out in various forms but which did not please its users, was seen as waste of resources and time for both potential customers and project team. Aim to establish and design out commonly known problems, before testing with real life users, was seen as important.

Roto, Law, Vermeeren & Hoonhout (2011, p. 8) noted that user experience is dynamic and might change over time. What participants experience during usability tests or interviews might be different from what they would perceive when using the service in the context of their everyday lifes. From the point of view of Roomforit.com project this means that while user's reflections were positive at the moment of evaluation, new issues might occur when service is published and used in a real life context. Because of this, service should continue to validate various design and business hypotheses as it was done in the first round of concept creation. This type of relentless

reflection and continuous improvement was presented by original TPS principles (Appendix A) and adopted in Lean startup's model of "Build-Measure-Learn". Such project values are thus likely beneficial also for the future development.

While thesis does not suggest adoptation of precise sequence and combination of project's approaches in other online service conceptualization projects, principles and components presented in the Build-Measure-Learn spiral (Figure 3-16) could work as a discussion mobilizer in similar works.

4 Conclusion

The success of any online business depends greatly on positive user experience. Designing of the business concept aimed at good user experience is a time and resource consuming task, since unique user experience is very often beyond the direct control of the service provider. This is of a particular importance for the provider who has not yet any prior feedback for his new product. This challenge was approached with two specific research problems.

The first question is in the selection of possible approaches, which could be used to support the concept designing for good user experience (UX). It was assumed that even a small team with limited resources could create a valuable online service concept, focusing on customer's delightful experience. Literature overview showed that there are no standardized means or "checklists" for dealing with UX in such typical projects.

The second question is whether and how Lean principles could guide project's design process aimed at good UX. Lean concentrates on striving to create a better customer value with good quality using less resources, or in other words, less waste, thus focusing on efficient value-creation. It is evident that conceptualizing all possible aspects of UX in a service, which is not yet available, is unrealistic. Due to scarce development and an early stage of the idea, project should be more focused. Therefore, design process of such potentially valuable concept could benefit from Lean principles.

These research problems were tackled here in practical project of Roomforit.com – a localized online service concept for meeting rooms booking. Designing for positive user experience in this case is particularly challenging due to presence of two different user groups: renters and leasers. In this work, various possible good user experiences were inspected through a framing lens of Lean.

Perceived UX of Roomforit.com service has been studied by carrying out relevant usability tests and AttrakDiff surveys. The results of user feedback were classified into four groups: pragmatic quality, hedonic quality - identity, hedonic quality - stimulation and attractiveness. It was noticed that for a business success of the concept, UX from both leasers and renters groups should match. This has been confirmed by comparison of the user survey feedbacks in the UX matrix. As an overall result, it has been confirmed that applying Lean principles for design of such new online service allows achievement of good user experience. These results were used in outlining of an overall concept for using Lean principles in implementation of similar service projects.

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Appendix A

14 Toyota Way principles

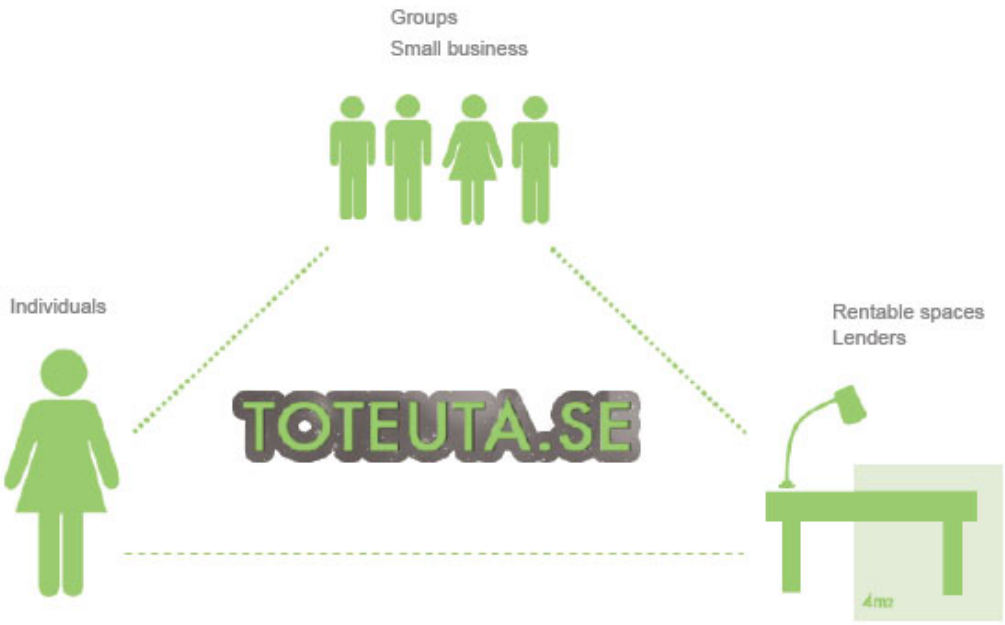
1. Base your management decisions on a long-term philosophy, even at the expense of short-term financial goals.
2. Create a continuous process flow to bring problems to the surface.
3. Use “pull” systems to avoid overproduction.
4. Level out the workload (*heijunka*). Work like the tortoise, not the hare.
5. Build a culture of stopping to fix problems, to get quality right the first time.
6. Standardized tasks and processes are the foundation for continuous improvement and employee empowerment.
7. Use visual control so no problems are hidden.
8. Use only reliable, thoroughly tested technology that serves your people and processes.
9. Grow leaders who thoroughly understand the work, live the philosophy, and teach it to others.
10. Develop exceptional people and teams who follow your company’s philosophy.
11. Respect your extended network of partners and suppliers by challenging them and helping them improve.
12. Go and see for yourself to thoroughly understand the situation (*genchi genbutsu*).
13. Make decisions slowly by consensus, thoroughly considering all options; implement decisions rapidly (*nemawashi*).
14. Become a learning organization through relentless reflection (*hansei*) and continuous improvement (*kaizen*).

(Liker, 2004)

Appendix B

Initial idea

Initial project idea composed for Master Thesis Seminar.



Appendix C

Executive Summary

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Spring 2011

Toteuta.se

- Airbnb.com for lean workspaces.

Executive summary

Description
Toteuta.se is an open, free online community market place for lean offices. It serves people who need to find a gathering and working space with flexible contract, affordable price and suitable amenities.

Target
Target group is people who are working with kick starting or on-going small-scale projects – individuals, entrepreneurs, craft groups and non-profit independent teams.

Features
Localized, intelligent search with social aspect concentrates on workspaces with cheap price and/or flexible availability. Such spaces are single desks, shared rooms, temporary office rent, daily “hot-rent”, office apartments, studios and hubs among others.

Scheduling tool might be offered for a fixed price for lenders who want to regularly rent their premises and conduct reservation online.

Market
There is a potential demand of the service on the market. Service will suit best small businesses that are considering moving from housework to co-shared space. It might also attract hobby and non-profit groups.

Added value
Customer’s added value is in saving time and having less hassle. Service provides accurate, local search for rent seeker and a great listing tool for lenders. Lenders will also have a tool that will help them manage reservation online: this reduces administrative work and increases their rent income.

Financing
Service’s prototype is build voluntarily. For further development basic investment of around 15.000 € will be needed. Service is free to use. Key profit engines are yet to decide, but they might be in-search bits, advertisement, reservation tool fee 9 € /month and additional features. Monetizing strategy will be redefined after analyzing tangible user data.

Mission and vision
Service’s mission is to be a quality, trusted and well-known workspace search tool for small business and NPOs. Vision is to cover European market and reach around 3000 monthly deals by the end of the first six months.

Steps
Next steps are to collect a team, build a well-tested prototype, gather data through partnership and data crawling, collect investment and promote service for broader public.

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About business plan
Creating concept for Toteuta.se (draft name, meaning do.it in Finnish) is a practical part of writers master thesis. Thesis studies lean online service concept creation. This business plan concentrates on reshaping the business idea, defying market need and providing next action steps.

1. Business idea

In the first business plan draft as well as in the presentation held at Creative Entrepreneurship lecture Toteuta.se was described as a service listing not only workspaces but also people looking for co-working and projects.

Initial idea was to offer service where in addition to finding rented workspace, people could find projects – i.e. create teams for some common cause – or other way around, teams or individuals with project ideas could look for missing group members.

Redefining the business idea

Digesting the questions raised after presentation and a fruitful discussion with a commendable mentor and a start-up entrepreneur made the idea change its direction.

Initial business idea	**Redefined business idea**
Target group: adults in the small creative business - artists, developers, planners, writers, organizers, students, hobby clubs, nomad workers.	Target: same
Main service points: • finding workspace • finding people • finding projects	Main service points: • finding flexible workspace

Main two reasons behind narrowing the scope:
1. Original idea was too vague to focus.
2. Such a service was not needed.

Initial business idea had lack of concentration. With more profound insight it became clear that for now it would neither easy nor wise to serve so many causes. Some of the features might be added later when there is a better understanding of what type of users this service will eventually attract.

Another reason behind giving up of the two other parts was that there is already a great range of services that help people in various creative fields to connect. For example Wreck A Movie (wreckamovie.com) is a community for filmmakers who want to collaborate on different independent video projects.

2. Market analysis

In this chapter I will briefly study current trends and habits on the market.

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Working small-scale

In the recent years self-employment and working in start-ups have gained popularity. High-speed connection, great availability of knowledge and various digital and physical tools had made working small-scale possible and easy. Micro-size companies (employing less than ten people) are pretty common. Small-scale businesses have also finally started to gain acknowledgment from legislation and political point of view.

Socializing and co-working

Generally, work is no longer considerate to be the epicenter of person's life. There have been many discussions about burnouts, stress and depression; cold-blooded and egoistic work style seen in the movie Wall Street in the late 80's did not paid off. From the early 2000 until recent years working alone at home was seen first as a luxury and later on as a standard for remote work. However, after working alone for a while many freelancers admit feeling that ambience at shared space is much more motivating that there own home.

In the past year there has been an uprising interest towards lean co-working: individuals gathering together at one location in order to accomplish a common cause or project or just to have a company of similar-minded people sharing the costs and bouncing ideas. This might indicate of upcoming trend of flexible co-working.

Hobbies and quality time

Downshifting movement rose against workaholism in the late 2007. After latest recession in 2009 many re-evaluated their goals in professional and personal life. Today people tend to value socializing and spending quality time with the hobbies they like.

Another interested tendency is that this new layback attitude together with online communities has enlightened artistic activity and returned many old-school craft hobbies back into fashion. Knitting, sewing, assembling, creating accessories, re-moderating, drawing, photographing and writing are popular hobbies. People also seem to like to do these projects together in small groups: this helps them to share material cost and makes it more fun. At the moment most gather at homes or attend events and workshops.

Freelancing

Rockstar and Freelancer Switch (2008) conveyed a global survey covering 3700 freelancer working in six different industries such as design, development and creative writing. Most of the freelancers were under 35 year old males, working in large cities either in US or Europe.

Half of freelancers worked part-time, which is also the most popular choice in small towns. Rural areas have most full-time freelancers.

Study's cross-section (Rockstar, 2008):

Intend to stay as freelancer	49,6 %
Top reasons to be a freelancer	Flexibility, creative control, work at home (58,1%)
Works at home	85 %
Works at office	Shared (7,9 %), Private (7,1%)
Feeling happier as a freelancer	Over 90 % (less: Illustrators, Video makers)
Self taught	46,1 %

Study (Rockstar, 2008) shows that freelancing in creative fields is a popular, motivating choice. Most of the survey answerers worked at home. Around 600 people worked at office. Large percentage of answerers was in their first or second year of self-employment.

Conclusion

There are many reasons why small-scale self-employed person would want to move from home to a shared space.

Need for social connection, based on colleague's answers and personal experience, occurs approximately after two years of solitude. Unless one's apartment is a hip loft in social center, at that time staying at home around the clock starts to feel like being in a box. For more extravert and social individual, boredom and need for social interaction and support might come ever earlier.

Finding a space and someone to share it with is however time-consuming and difficult. Many offices also want a long-time contract, which might frighten entrepreneurs that are "pretty ok" at being home. Some feel afraid of coming to a room when just in the beginning in their business. Tolerable home ambiance is also seldom seen as a reason to quit individual business – many just deal with. Offering a tool for finding flexible co-shared spaced can patch this problem.

Another market opportunity is in non-profit hobby groups and creative teams that would need the space only occasionally: hour for gathering, few hours for organizing a workshop or work on some task, a week for a small indie project and so on.

3. Competitor analysis

Service's main competitors are *online community marketplaces* that concentrate on small-scale listing. Below are few of know active examples:

AirBnB

AirBnB.com (2011) is not a direct competitor but it might easily become one if it starts offering office spaces in addition to their current service. AirBnB is a popular global search tool, which concentrates on finding apartments for short period. Apartment's prices vary from around 5€ - 250 € and types from shared room to entire homes. Money transaction goes through PayPal or credit card, which means that AirBnB works as an intermediate. Listing is free but AirBnB charges 3% of the total cost of the reservation to cover the cost of processing.

Shared Business Space

Share Business Space (Sharedbusinessspace.com, 2011) resembles GraigList with visuals. It is less appealing and has fewer features than most novel search sites but it has a great range of specific office types, including pop-up shops, photo studios and spaces for non-profit organizations. Listing is free for the first month; following listing costs 25 dollars.

Loosecubes

Loose Cubes (loosecubes.com, 2011) is a simple, map based search tool. Its main market is in US though map-based search makes it open for other markets as well.

Loose Cubes suits well small groups – teams or small companies with stable business; most of the rented spaces are middle-prized. Despite good outlook, service lacks some important search features and has hardly any office rent data in Europe.

Evenues

Eenues (Evenues.com, 2011) concentrates on meeting rooms, desk space, classrooms and even spaces. Users can search, compare and book rooms with credit card. Lenders can take advantage of online booking calendar. Mostly in US operating Evenues service charges 13% processing fee for successful deal, listing is free.

Liquid Space

Liquid Space (Liquidpace.com, 2011) is a location-based iPhone and iPad application. It is targeted to white-collar entrepreneurs. Service lists quality nearby workspaces that can be found and booked on the go, also for brief period of time. Service operates in US.

Desk space rentals

After latest recession in the early 2009 prices on office spaces became more affordable. Finding suitable, nearby workspaces was however complicated. This opened an online market for renting desks to self-employed freelancers. Desk space rent is offered for instants through websites such as Rentadesk.co.uk, Officeshare.co.uk and Deskspacegenie.co.uk. (Cavaglieri, 2010).

Most of sites are free or freemium – listing might cost certain amount of money in return for some additional features or greater visibility. Some community markets works as simple message platforms, others have a bigger role in the deal. For example Officeshare.co.uk charges a month's rental fee for any successful agreements. Desk Space Genie makes revenue on bidding, i.e. lifting up featured search results.

Conclusions

Most successful shared workspace online markets and intermediaries are based in UK and US. There might be however successful local services that do not appear in English search.

Frequently reoccurring features are location-based search, photos, customer reviews and detailed amenities, such as for instants whether the office have high speed wi-fi or not. Some popular services also provide phone customer service.

Based on data such as venue info, pictures, prices and conditions, services mostly target quasi-sustainable business. Most of spaces are clean and technically well equipped, quite stereotypical offices or lofty and cozy rooms. They seem to be particularly suitable for IT-project, planning, development and design, business meetings, consulting meetings and workshops. They are seldom good for artistic activity, displays, hobby clubs and other types of low-scale creative business and informal gathering.

Services revenue is mostly created through charging a listing fee or collecting a percentage of successful deals. Some applications offer addition services such as booking possibility and money transaction through a third party.

Other competitors

Other competing sources might be field related **forums** such as illustrator's Pingstate.nu or designer's portal Pixel.ee. When person is not familiar with such specific sites, he or she might start looking from **local public forums** such as Suomi24.fi in Finland.

Small business working especially in IT and economics might contact **hubs** like Garage48, **incubators** and **university labs** directly. Working in such places usually means that person or business is already somehow connected to the venue – for instants working in collaboration with university of participating in a start-up program.

With locale artistic activity in question one might find workspace also for instants by looking for information in the **newspapers**, **post boards** or simply by **asking around**.

Sometimes creative circles are tight and this sort of information pings between insiders without being posted online. Another tendency is to promote open spaces on **venue's own page**. For example art houses such as Fimbul (Fimbul.info, 2011) advertise soon to be open classrooms and workshops spaces only in their blog.

4. Customers

Service is targeted to two main use groups – tenants and lessors.

Target market

- Western Europe
- Test market in Scandinavia

Target groups

Renters

- Adults, approximately 24–50 year olds
- Need a space once or occasionally *or*
- Need a semi-permanent contract
    - Working in small-size creative business an participating in other creative activity:
        - Self-employed individuals
        - Start-ups, co-workers and small teams
        - Non-profit groups, such as hobby clubs

Lessors

- Space that is rented once or occasionally
- Space that is rented continuously but to various groups
    - Individual properties such as apartments
    - Studios, galleries
    - Production-spaces
    - Club rooms
    - Hubs, incubators
    - Office properties with spare desks

Possible users groups:

- Retailers, pop-up shops
- Small event organizations
- Temporary storage

Based on competitor research the most poorly served segments in the market in question are artists and non-profit groups that are looking for a temporary, suitable and affordable space.

From the other point of view lessors who lend art and craft workspaces are either highly popular are hidden from public. Hidden and idle spaces are for example community rooms in apartment buildings that are often empty, storage rooms that are suitable for creative work and schools during holidays. There are also hardly any tools for lender to let random visitors book the space online.

Redefining potential users

Outlining target groups is a good starting point for understanding the need of potential users. Basic conclusions help to define on an abstract level whether the site is aiming to appeal grown-ups or kids, men or women, informal socialization or formal interaction and so on. It is obvious that with Toteuta's target groups there is no need to invoke quality office brokers or white-collar folks working in Bank area in London.

But is there a way to clarify potential user groups and their needs on more detailed level? In online service design further steps are a highly debatable question. They can be roughly divided into two:

1. Intuition – doing nothing

   Some web service designers encourage simply following one's guts. This means design the service as quickly and well as possible; opening it to the public and only then starting molding and tweaking it after there is feedback, statistical data of users and a product that would appeal even more This model has worked well for Facebook, Twitter, Google and other major companies.

2. More research

   Another school supports idea of using tools such as surveys, discussions with stakeholders and usability testing. User-centered service design process is sometimes also supported with personas and scenarios methodology. Personas are "archetypal users of an intranet or website that represent the needs of larger groups of users, in terms of their goals and personal characteristics" (Calabria, 2004).

Toteuta.se is taking advantage mostly of the first approach, intuition.

Pros – Best scenario
There is a clear opportunity window. Profound potential customer research might close it before the service is even established. Another risk is that equation mark between guessed user groups and actual user groups might never appear. Many companies have found themselves in situation where online service became popular among others than they originally expected: emo-kids instead of graphic designers, 30-year old hipsters instead of 60-year wine lovers and so on. Designing on the go and serving actual needs might give service a great competitive advantage.

Cons – Worst scenario
Intuition might fail. Design and functions might not appeal to anyone. Competitors might take advantage of 'surface preparation' and create far more appealing service. People might reject using the service because they don't like it's image, they don't trust it, they would find it hard to use or maybe even because they don't see any added value in using it at all. Time might be wasted because of lack of understanding the market need.

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5. Service

This chapter will cover initial concept of Toteuta.se.

Service description

Toteuta.se is an Europe-oriented online community market for small business workspace. Service will work on web, smart phones and tablets.

Main features

- Listing tool for
  - Renters
  - Lenders
- Automatic location detection
- Intelligent search with reactive search algorithm
  - Soft ranking
  - Domain related keywords
    I.e. “wi-fi, ventilation, tap, security, storage, etc.”
  - Comparison tool
- Scheduling and reservation tool for long-time renders
  - Web
  - Mobile
- Social connection
  - Renters can connect their profile to existing services
  - Ranking, commenting on spaces

Possible future features

- Inviting users to share a certain space
- Online-payment as in AirBnB

Added value

Renters	Lenders
Saving time	Reaching new market
Saving money on flexible contracts	Activating idle or unknown business
Hassle-free search	Reducing administrative work with scheduling and reservation tool
Motivation from accomplishment	Saving money on free listing

Marketing

Toteuta.se is a **differentiated** service**. Customers** will be given an easy, domain-oriented and community-driven marketplace for workspace listing.

Competitive advantage of the site will be in its target market (small-scale business), locative, reactive and domain smart search and affordable scheduling tool.

Main **promotion point** is web. Web marketing will be conducted via search optimization, social networks and partnership with relative sites such community pages. Service will also encourage users to participate in community by commenting, rating and spreading the message outside.

Google **advertisement** will be used if needed. Other advertisement and promotion channels might be local events, directs contacts and physical and virtual bilateral sponsorship. Service will push itself also to related media in order to get mentioned in tech and creative blogs, online newspapers and traditional media.

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Organization

Service will be constructed in a group of 3–4 people: developer, designer, front-end developer and project manager who also handles marketing. Profits will be divided accordingly either with shares or salary, if service carries out well.

Finance

Investments
At the early stage, start-up needs to invest in volunteering work. Software development will take approximately four full weeks from four people. Service investments will be around 40–50 €, with extra cost will occur. Project prototype can be created using existing tools.

Later on, start-up will need to invest in:

- Office space, 400 – 500 €/month
- Salaries, 4 x 1.500 € = 6.000 € /month
- Administration, accounting 500 € /month
- Other fixed and variable costs such as hardware, marketing, pr 300 € / month
- Total 7.300 €

Revenues
Revenue model will be clarified after there is a solid understanding of user groups and their needs. Possible key profit engines could be:

Featured search Similar to Google Ads bits	3 € / week
Advertisement with Google Ads	App. 15 – 50 € /month for 1000 daily visitors
In-page advertisement	100 € / month
Reservation tool	
Monthly fee	9 €
Customization fee, one-time	15 €
Domain redirection, one-time	15 €

Break-even point
In the beginning, when work is voluntary, break-even point will be around 20 € / month (service costs). If company employs four people and opens an office, costs will rise to break-even point of approximately 7.300 € / month.

Example 1: 10.000 visits, 1.000 deals, 60 units of reservation tools, 30 units of other features.

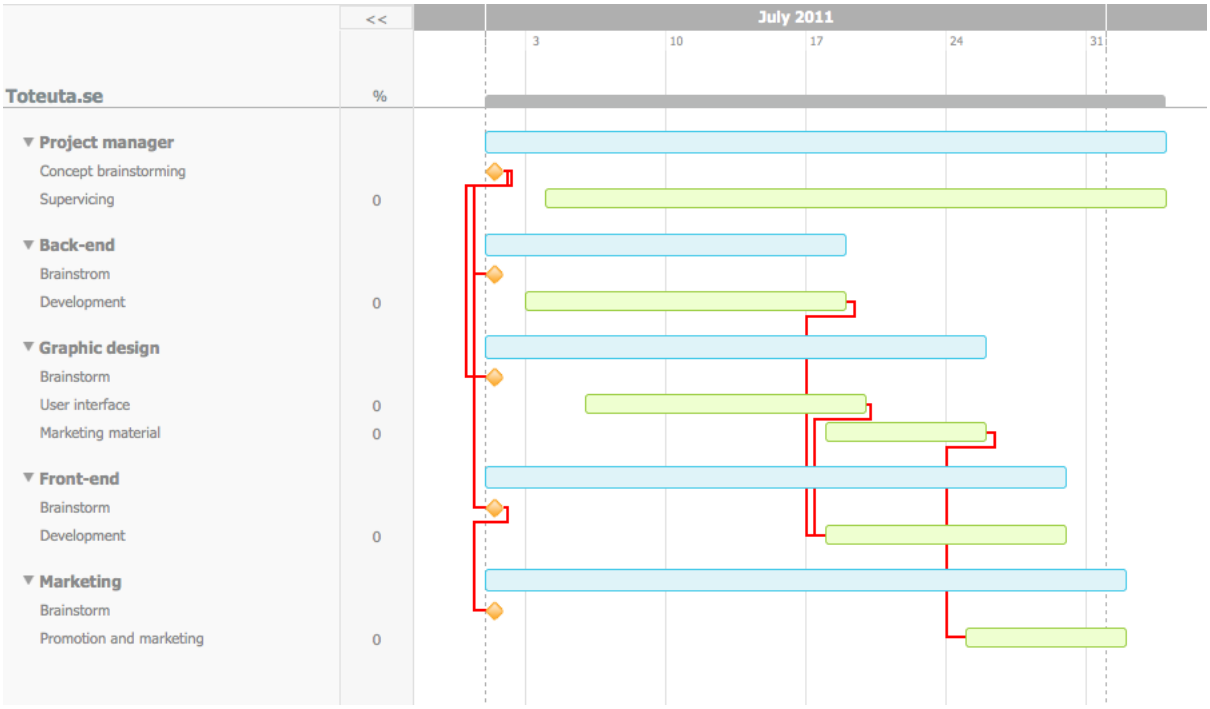
Reservation tool	60 x 9 € = 540 €
Customization and domain tools	30 x 15 € = 450 €
Advertisement	100 €
Google-ads	150 €
Total	**1.240 €**

Example 2: Break-event point

Reservation tool	390 x 9 € = 3.510 €
Customization and domain tools	235 x 15 € = 3.525 €
Advertisement	100 €
Google-ads	165 €
Total	**7.300 €**

6. Implementation plan

The most crucial part of the project is technical viability of the service. If service fails to work, users will not come back. Since resources are not large enough to create a massively operating service from the scratch, in the beginning the team of 3–4 members will need to build a prototype. Below is a simple Gantt chart of main steps and dependences.



Specific action steps

- Defining concept in details
- Forming a team
- Brainstorming; setting technical goals for prototype
- Outlining service features and content
- Designing
- Developing
  - Feedback
- Testing
  - Feedback
- Contacting partners, gathering renting data
- Going live
- Marketing, promotion
  - Feedback
  - Finding investors
- Further development

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Appendix D

iRent Project Plan

Tallinn University

IMKE / Institute of Informatics

Project Plan

Valeria Gasik

Tallinn 2011

Content

INTRODUCTION 3

1 PROJECT BACKGROUND 3

Business idea 3

Business idea development 4

Project model 4

Additions to project model: market research and design analysis 4

2 PROGRESS REVIEW 5

Project scope and objectives 5

Project delieverables and milestones 6

Resources 6

Architecture 6

Budjet 7

3 TIMELINE 7

Time sheet 7

Gantt chart 8

Podio 9

4 EVALUATION 9

REFERENCES 9

Appendix 1 – Technical development required during the iRent project

Introduction

This project plan was created and analysed for Project Management course, IMKE master program in Tallinn University's Institute of Informatics. The plan has a real life connection to the Aalto University/ACE (Helsinki) funded prototype project that started in the beginning of December 2011. It is also connected to a broader subject – a thesis that studies lean and agile concept design methodologies and practical online service prototyping.

The objective of the project plan is to reflect on real schedule, deliverables, milestones, budjed and project scope. Writer is also interested in practical micro-level planning, online tools and utilizing social networks for remote communication.

1 Project background

General information about the business idea, service objectives, target group etc.

Business idea

IRent (work title) is a dedicated meeting room booking service which:

1. Gives an ability to *find* a suitable meetng room with required amenities,
2. specify its *availability* on a certain time and
3. to make a *reservation/payment*.

"iRent" is a concept of an online information and reservation system with flexible prices balanced by demand and availability. The service *leasers* – property owners – can manage their rooms' occupancy by adjusting pricing and availability (as with airplane tickets). Service *users* will be able to easily rent meeting rooms according to their needs, on the go.

Market

Right now, it is really hard to not only find a suitable meeting room but also to deal with booking and paying for it. There is large number of empty and idle office spaces – for example in Helsinki metropolitan area now ~1,000,000 m2 is not occupied (~12.5%). This value is proportional to the meeting rooms' idle status. This trend has been continuing during last 10 years and rising an occupation rate is the main problem from property owners. Meeting rooms market is even more fragmented than offices, the information is destructured and marketing

conditions are somewhat obscure. Often potentially available rooms are 'hidden' and the service level is low: booking happens by phone or through sending e-mails and waiting for answers. Itn most cases it is impossible to book and pay for a meeting room on-the-fly.

Business opportunity

Properly organized leasing service could be a business opportunity also for spaces that are currently unused. For the office space average rent value of 20 €/m2/month, Greater Helsinki area property owners are losing 20M€ every month (potentially about a million euro a working day). This requires new on-demand and flexible renting system capable on increasing of the cash flow.

Main risks

Business idea is not uniq, there are many analog booking systems that are applied for different types of objects: hotels, hostels, plane tickets, gyms and even hair dressers. A large company, such as premesis owner (Teknopolis) or service prowider (Regus, AirBnb) might aquire such innovation quite fast. Risk prevention should be included into strong competive advantage (great usability, price, design) and differentation, that is applied from the early stage.

Business idea development

The first version of the business idea was evaluated in the course Creative Entrepreneurship in Spring semester 2011. The initial idea has changed drastically since, mostly based on feedback of business plan evaluation but also after several conversations with peers, friends and professionals in the field.

Project model

The project plan concerns a small scale online service prototype and might be described with *ADDIE* model. ADDIE is an abbrevtion for analyze, design, develop, implement and evaluate. The model is suitable for description since there are only two team members with sufficien experience and background, tasks are quite linear with rather clear sequence and there is a set scope for the prototype stage. Another traditional way to describe the project plan could be following: determination of requirements of the service, online service design, coding, testing and implementation. (Nomak, 2011.)

Additions to project model: market research and design analysis

I started this project plan description with a title "business idea". Project management and marketing are commonly tought separately – this I learn for instants during my business administration bachelor studies in HAAGA-Helia. As a designer I am also interested in aestetics, content, usability and user experience of the service; all usually mentioned but not emphasized in ADDIE -type of models.

For instants life cycle software development model sees that goal of *requirement*s stage is to " determine the functional specification of the system. Possibilities to use previously developed (sub)systems should also be taken into account" (Normak, 2011). Competitor and marketing research could be fit under but these type of actions are not specifically explained.

My personal background and interests together with the main competitive advantage of the business idea are the main reasons why I feel that ***relevant*** *design analysis* and *market research* should be visibly included into small scale planning. For this prototyping stage (based on initial idea evaluation) the strongest competitive advantage would be simple and clean design together with flexible and user-friendly pricing.

What would this mean exactly? Clean and simple design can be analyzed through competitor research, moodboards and best practice references; ideal pricing method though market and competitor research. Also service name and brand are important – background research for this is needed as well. ADDIE model would include these research questions under stage of *analysis*. In time line planning and descriptions I have also used term "*service design"*.

2 Progress review

Progress review contains description of project's objectives, delieverables, milestones, resources and architecture.

Project scope and objectives

Project outcome is a working prototype. Project's objectives are (in short):

1. Developing a working prototype with a proper GUI
2. Conducting user testing (usability, UX and feedback)
3. Evaluating market potential
4. Evaluation business opportunities in Finland and later abroad
5. Critical assessment of business modalities

Prototyping: A working prototype of the web service – the portal beta-version designed, developed and tested in the most common environments.
User testing: Along side of development process user testing will be conducted, preferably with service users and leaser clients. UX/feedback is included.
Market potential: The main goal for this project is to evaluate the market potential of the service through testing

concept and developed prototype with users and clients.

Business opportunities: The ways of business development will be evaluated (start up form, cooperation partners, potential investors, leading customers, IPR issues where relevant, risks assessment, etc.)

Business modalities: In the case of business establishment, the preferred modalities of the operations will be assessed (venture form, licensing, franchising, sales, ownership etc.) together with the entry and exit strategies.

Project delieverables and milestones

Milestones

week 52 / 5th project week	- Backend setup done - Wireframing done - First client contact made
week 8 / 13th week	- Initial graphic user interface completed - Front-end done - Two interview/test sessions made

Deliverables

week 3 / 8th week	- User interview conduction and feedback analysis
week 8 / 13th week	- User test B conductions and feedback analysis - Evaluation of the project - Evaluation of future actions

Resources

Project is conducted by a team of two person. Project resource plan is shown in Table 1.

Phase	Estimated work	Person
Project Management: Planning project; research	24 mh	Gasik
Implementation and testing	100 + 120 mh	
Service design (wireframing, design, layouts)	70 mh	Gasik
Service development	120 mh	Vaher
User testing (organization, execution, analysis)	30 mh	Gasik
Piloting: Feedback collection and processing	16 mh	Gasik
Summary and reporting	10 mh	Gasik

Table 1. Preliminary resource plan

Architecture

Detailed description of online service architecture is presented in Appendix 1.

Budjet

Project was given a funding of 5.000 € which is also a budjet for the prototype development. Details of budjet are shown in Table 2.

Salaries	1.700 € (brutto)
External services (outsourced development)	3.000 €
Travels	200 €
Other expenses	100 €
Total	5.000 €

Table 2. Budjet

3 Timeline

Project plan was build using following tools: Podio, Gantt chart and time sheet.

Time sheet

Time sheet (Figure 1) was composed after defining project objectives and needed phases.

	A	B	C	D	E	F
1	**Task / Week**	**48**	**49**	**50**	**51**	**52**
2	**Service planning**	Setting up Podio Project schedule Goals & Outcomes	Timeline Competitor research	Data research	Name	
3	**Wireframing**		Leaser's page	Leaser's page User's page	Missing views	Missing views
4	**Graphic layout**				Moodboard CSS solutions	Main page redesign Search views Booking
5	**Back-end**					
6	**Front-end**					
7	**Testing**			User questions		*User interview option date A*
8	**Pr**			*14.12 Futurice at 17* *15.12 Taik Demo 13-17* *15.12 Defa event 14*		
9	**Milestones**					Back-end set Wireframing done Contact established
10	**Deliverables**					

Figure 1. Screenshot of project's time sheet.

Schedule was first composed with post-it notes on a large white notepaper and then moved, with greater details, to sharable Google Document. This solutions allows our team to easily adjust timeline's content. I did not used iCal or other desktop applications, because they would not have synked with Kristo's computer.

Gantt chart

Unfortunately GanttProject that I installed on my computer did not worked well, so I builded Gantt chart online (https://teamgantt.com). This online tool gives possibility to create dependencies among resource's tasks and milestones (Figure 2) so it works in a similar way as GanttProject.

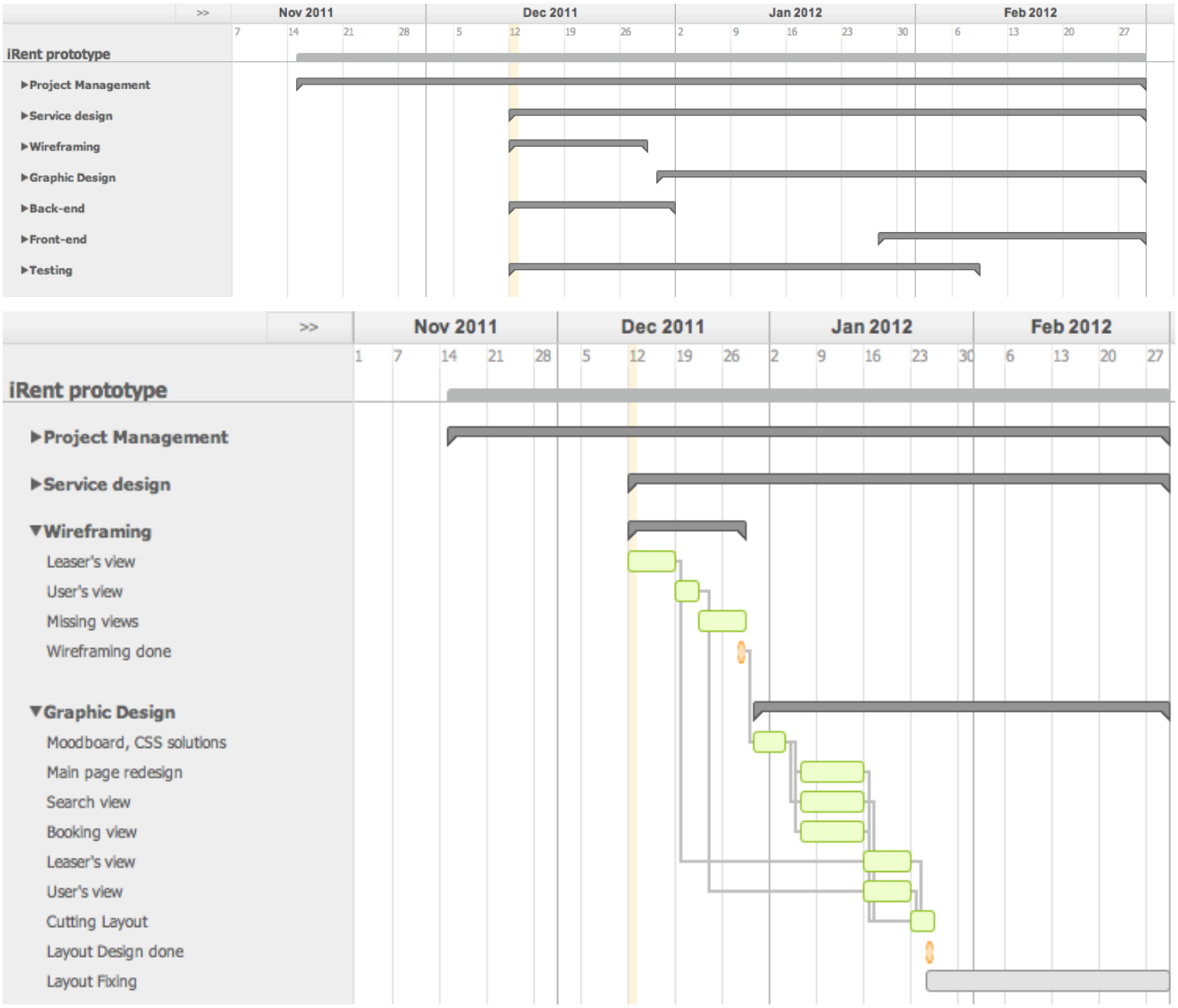


Figure 2. Project's Gantt chart created online (teamgantt.com).

Podio

For documentation and communication purposes our team will use free project management service Podio. Podio enables to create distinguishing departments and attach relative application, such as for example Bulleting list, Documents and Meeting Calendar in "Project planning".

4 Evaluation

Real project evaluation will be conducted at the end of February 2012 accordindly to the set objects (Chapter 3).

References

Normak, Peeter. Aspects of ICT project management, 2011. Tallinn University.

Appendix 1 **Technical development required during the iRent project**

Setup

- Setting up web server, possibly a virtual hosting service from temporary service provider.
- Setting up web server settings for the project and testing suitability for the project. In relation to PHP and MySQL.

System Architecture

- Setting up web development framework for the project. Private framework, that is based on Model-View-Controller principles, is used.
- Setting up URL mappings for the prototype that assign functionality to specific URL's.
- Setting up translation files for the prototype.
- Setting up primitive model and view files and testing navigation and cache logic from system standpoint.

Database Architecture

- Mapping out required database tables in the context of prototype functionality.
- Rooms table design
- Renters table design
- Users table design
- Pictures table design
- Amenities table design
- Contact (feedback/questions) table design
- Comments table design
- Bookings table design

Functionality and User Interface Integration

- Home page integration
- Search bar functionality
- Search/List view
- Search/Pictures view
- Search/Map view
- Comparison pinning functionality
- Comparison view and functionality
- Registration/Login functionality for users
- Registration/Login functionality for renters
- Room view (pictures, map, calendar, comments, renter contact)
- Booking view
- Payment view
- Confirmation view
- Confirmation e-mails (generated HTML + sending)
- Adding a room functionality
- Adding pictures functionality
- Defining booking times and exceptions for booking times for rooms

Additional

- Double-booking checks and warnings
- Price calculation algorithms
- Security enhancements to protect from XSS and injection attacks.

Appendix F

Quatified AttrakDiff Single Evaluation Test Result Data

Appendix – Quantified AttrakDiff Single Evaluation Survey Result Data

	renter	**leaser**	**-3**	**3**			**Renter**	**Leaser**	**Renter**		**Leaser**	
Q #	value	value	low	high		category	value, %	value, %	mean	stdev	mean	stdev
1	0.32	1.51	technical	human	Pragmatic Q	humanity	55	75				
2	0.69	2.01	complicated	simple		simplicity	62	84				
3	1.69	2.01	impractical	practical		practicality	78	84				
4	1.67	0.23	cumbersome	straightforward		straightforwardness	78	54				
5	0.67	1.5	unpredictable	predictable		predictability	61	75				
6	0.67	-0.01	confusing	clearly structured		clarity	61	50				
7	1.67	0.25	unruly	manageable		manageability	78	54	**67.6**	**9.9**	**67.9**	**14.7**
8	1.67	0.02	isolating	connective	Hedonic Q – Ident	connectivity	78	50				
9	2.01	2.04	unprofessional	professional		professionalism	84	84				
10	1.7	1.72	tacky	stylish		style	78	79				
11	0.32	-1	cheap	premium		value	55	33				
12	1.69	-0.25	alienating	integrating		integration	78	46				
13	0.66	1.5	separates me	brings me close		bringing me closer	61	75				
14	2.03	0.01	unpresentable	presentable		presentability	84	50	**74.0**	**11.2**	**59.6**	**19.4**
15	1.74	1.49	conventional	inventive	Hedonic Q - Stim	inventiveness	79	75				
16	2.03	-0.03	unimaginative	creative		creativity	84	50				
17	2	0.73	cautious	bold		boldness	83	62				
18	1.67	1.73	conservative	innovative		innovation	78	79				
19	1.34	-0.75	dull	captivating		captivity	72	38				

Appendix – Quantified AttrakDiff Single Evaluation Survey Result Data

20	0	-1.75	undemanding	challenging		challengability	50	21				
21	1.34	1.24	ordinary	novel		novelty	72	71	**74.1**	**11.6**	**56.3**	**21.4**
22	2.03	2.23	unpleasant	pleasant	Attractiveness	pleasantness	84	87				
23	2.03	0.03	ugly	attractive		attractivity	84	51				
24	2.03	2.54	disagreeable	likeable		likeability	84	92				
25	2.03	0.02	rejecting	inviting		inviting	84	50				
26	1.65	2.27	bad	good		goodness	78	88				
27	1.34	-0.28	repelling	appealing		appealing	72	45				
28	1.33	1.74	discouraging	motivating		motivating	72	79	**79.6**	**5.5**	**70.4**	**20.7**

AttraDiff question data was presented in the range of -3 to 3. These values were converted to percentages for comparison.

Appendix E

Usability Test and Interview Templates for “Renters” and “Leasers”

E1. Template for “Renters”

E2. Template for “Leasers”

Participant: **Date:**

RoomForIt.com

Testin rakenne / Test Structure

25 min haastattelu / interview
5 min palvelun esittely, ongelman esittely / introduction of service and test problem
25 min tehtävän suorittaminen / completing task
5 min yhteenveto / wrap-up

Demograafiset kysymykset / Demographics

Gender

Internet usage

Tavat ja prosessit - Nykyinen käytäntö / Habits and behaviors - Current situation

1. Minkälaisiin tilaisuuksiin olet varannut huoneita osana työtäsi? Esim. palaverit, seminaarit, luennot.
What type of meeting room bookings do you do as part of your work? Ex. meetings, seminars, lectures.

2. Mikä on ollut tilaisuuksien luonne? Esim. kesto, osallistujien määrä, palvelut?
What was the general nature of these meetings – duration, number of participants, additional services?

3. Miten usein varaat sinulle ennestään tuntemattomia tiloja (oman talon ulkopuolelta)?
How often do you book new meeting rooms (outside your facilities)?

En koskaan	Harvoin	Silloin tällöin	Usein
Never	Rarely	Occasionally	Often

3-A ...miksi/why?

3-B ... jos varaa uusia: Mistä ja miten löydät huoneita?
... if booking new rooms: How and with which tools you find rooms?

---

4. **Mitä työkaluja ja toimitatapoja käytät omien ja ulkopuolisten huoneiden varaukseen?**
   What tools and processes do you use to book rooms in your facilities and in other venues?

5. **Millaisia ongelmia olet kokenut huoneiden varauksessa?**
   What type of problems have you perceived with bookings?

6. **Milloin varaukset ovat onnistuneet mielestäsi huoneiten? Mitä tapahtui?**
   What was the worst experience with booking? What happened?

7. **... entäs mielekkäin?**
   ... what about the most pleasant?

Taustakysymykset / Background questions

Jos palvelu olisi helppo, varaisitko huoneet suoraan netistä?	**Kyllä**	**Ei**
If it would be easy, would you book meeting rooms online?	**Yes**	**No**
Jos olisi mahdollista, maksaisitko huoneesta samantien verkkopankissa tai kortilla?	**Kyllä**	**Ei**
If it would be possible, would you pay for the room with internet bank or credit card?	**Yes**	**No**
Jos varaus olisi helppoa, varaisitko enemmän ennestään tuntemattomia huoneita?	**Kyllä**	**Ei**
If it would be easy, would you try out more rooms that are not familiar to you?	**Yes**	**No**

TOINEN OSA

SECOND PART

Intro

Esitän seuraavaksi nettipalvelun, jonka olemme kehittäneet kolleegani kanssa. Näet edessäsi kuvista tehtyä hahmotelmaa. Kyse on siis demosta – osa napeista toimii, osa ei.

Pyydän sinua tekemään kolmea tehtävää järjestyksessä. Osoita sormella ruudulla mihin painaisit tai voit esittää klikkausta hiirellä. Edetään niin hitaasti tai nopeasti kuin haluat. Emme testaa sinun teknistä osaamista, eikä tässä ole vääriä vastauksia. Pyydän sinua myös ajattelemaan ääneen.

I will next introduce you a online service, that we designed together with my colleague. You will see a mock-up that is made of static images. It's a demo – some of the buttons work, some will not.

I will ask you to do three tasks in an order. You can point to the screen or pretend that you click on something with a mouse. We will move as slow or fast as you wish. There is no wrong answers and we are not testing your technical skills. I will also ask you to think out loud.

Participant: **Date:**

T1: Löydä palaverihuone saunalla Helsingistä. / Find a meeting room in Helsinki with sauna.
T2: Tutustu huoneen lisätietoihin ja sijaintiin kartalla. / Get familiar with room's details and location on the map.
T3: "Varaa" huone. / "Book" the room.

Sivunäkymä - View

Aloitussivu / Landing page

Hakusivu, listaus / Search page, list view

Hakusivu, listaus lisätiedoilla / Search page, list results with details

Hakusivu, kuvat / Search page, picture view

Hakusivu, kartta / Search page, map view

Huoneprofiili - Room profile

Huoneprofiili (ensivaikutelma) / Room profile (first impression)

Huoneprofiili, huone varattu / Room profile, room taken

Huoneprofiili, kuvat / Room profile, picture view

Varausprosessi - Booking process

Varaus, tilauksen tiedot / Booking, filling in details

Varaus, maksutapa / Booking, payment selection

Varaus, ongelmatilanne / Booking, error

Varaus, kuitti / Booking, receipt

Muistiinpanot / Notes

Participant: **Date:**

RoomForIt.com

Testin rakenne / Test Structure

25 min tehtävän suorittaminen / completing task
25 min haastattelu / interview
5 min yhteenveto / wrap-up

Demograafiset kysymykset / Demographics

Gender

Internet usage

Tavat ja prosessit - Nykyinen käytäntö / Habits and behaviors - Current situation

1. Minkälaisia tilaisuuksia tiloissanne järjestetään? Esim. palaverit, seminaarit, luennot.
What type of events are organized in your facilities? Ex. meetings, seminars, lectures.

2. Mikä on ollut tilaisuuksien luonne? Esim. kesto, osallistujien määrä, palvelut?
What is the general nature of these meetings – duration, number of participants, additional services?

3. Kuinka usein varaaja on ensikertalainen?
How often person booking a meeting room is reserving it for the first time?

En koskaan	Harvoin	Silloin tällöin	Usein
Never	Rarely	Occasionally	Often

4. Mitä työkaluja ja toimitatapoja käytätte huoneiden varausprosessiin? Esim. puhelin, email.
What tools and processes do you use to book rooms in your facilities and in other venues? Ex. phone, email.

5. **Millaisia ongelmia olet kokenut huoneiden varauksessa?**
   What type of problems have you perceived with bookings?

6. **Milloin varaukset ovat onnistuneet mielestäsi huoneiten? Mitä tapahtui?**
   What was the worst experience with booking? What happened?

7. **... entäs mielekkäin?**
   ... what about the most pleasant?

Taustakysymykset / Background questions

Jos palvelu olisi helppo, hallinnoisitko huoneiden vuokrausta netissä? **If it would be easy, would you manage meeting rooms online?**	**Kyllä** **Yes**	**Ei** **No**
Jos olisi mahdollista, haluaisitko että huoneesta maksettaisiin etukäteen verkossa? **If it would be possible, would you like to receive payments online?**	**Kyllä** **Yes**	**Ei** **No**
Jos olisi mahdollista, haluaisitko että huoneesta lähetetään automaattinen lasku? **If it would be possible, would you like clients to receive automatic invoice after booking?**	**Kyllä** **Yes**	**Ei** **No**

TOINEN OSA

SECOND PART

Intro

Esitän seuraavaksi nettipalvelun, jonka olemme kehittäneet kolleegani kanssa. Näet edessäsi kuvista tehtyä hahmotelmaa. Kyse on siis demosta – osa napeista toimii, osa ei.

Pyydän sinua tekemään tehtäviä järjestyksessä. Klikkaa kohtia hiirellä tai osoita sormella ruudulla kohtaan, mihin painaisit. Edetään niin hitaasti tai nopeasti kuin haluat. Emme testaa sinun teknistä osaamista, eikä tässä ole vääriä vastauksia. Pyydän sinua myös ajattelemaan ääneen.

I will next introduce you a online service, that we designed together with my colleague. You will see a mock-up that is made of static images. It's a demo – some of the buttons work, some will not.

I will ask you to do tasks in an order. You can click on the screen or point it with your finger. We will move as slow or fast as you wish. There is no wrong answers and we are not testing your technical skills. I will also ask you to think out loud.

Participant: **Date:**

T1: Lisää uusi huone palveluun / Add new room to the service.
T2: Muuta su 22.12 aukioloaikaa ja hintaa. / Change price and opening hours on 22.12.
T3: Katso 28.10 varauksen lisätiedot. / Check the details reservation on 28.10

Sivunäkymä - View

Uusi huoneprofiili - Add new room profile

Lisää huone / Add room

Rekisteröidy/kirjaudu / Register/sign in

E-mail

Etusivu

Huoneet - Rooms

Huoneiden etusivu / Room's main page

Kalenteri / Calendar

Varaukset - Reservations

Varaus, listaus / Booking, list

Varaus, lisätietoa / Booking, additional listing

Muistiinpanot / Notes

Appendix A

14 Toyota Way principles

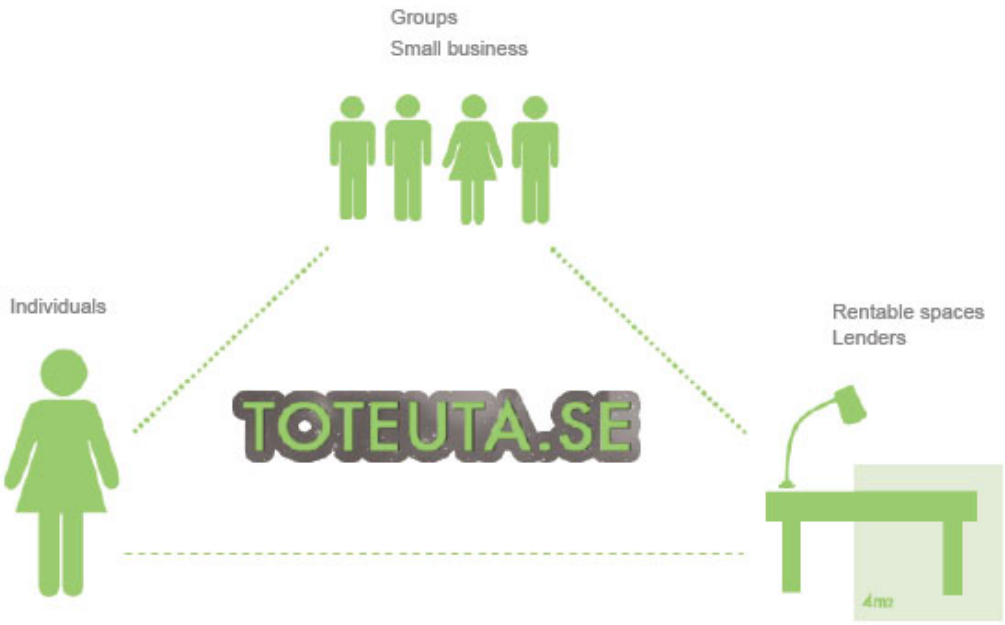
1. Base your management decisions on a long-term philosophy, even at the expense of short-term financial goals.
2. Create a continuous process flow to bring problems to the surface.
3. Use “pull” systems to avoid overproduction.
4. Level out the workload (*heijunka*). Work like the tortoise, not the hare.
5. Build a culture of stopping to fix problems, to get quality right the first time.
6. Standardized tasks and processes are the foundation for continuous improvement and employee empowerment.
7. Use visual control so no problems are hidden.
8. Use only reliable, thoroughly tested technology that serves your people and processes.
9. Grow leaders who thoroughly understand the work, live the philosophy, and teach it to others.
10. Develop exceptional people and teams who follow your company’s philosophy.
11. Respect your extended network of partners and suppliers by challenging them and helping them improve.
12. Go and see for yourself to thoroughly understand the situation (*genchi genbutsu*).
13. Make decisions slowly by consensus, thoroughly considering all options; implement decisions rapidly (*nemawashi*).
14. Become a learning organization through relentless reflection (*hansei*) and continuous improvement (*kaizen*).

(Liker, 2004)

Appendix B

Initial idea

Initial project idea composed for Master Thesis Seminar.



Appendix C

Executive Summary

Valeria Gasik
IMKE, Tallinn University
Spring 2011

Toteuta.se

- Airbnb.com for lean workspaces.

Executive summary

Description
Toteuta.se is an open, free online community market place for lean offices. It serves people who need to find a gathering and working space with flexible contract, affordable price and suitable amenities.

Target
Target group is people who are working with kick starting or on-going small-scale projects – individuals, entrepreneurs, craft groups and non-profit independent teams.

Features
Localized, intelligent search with social aspect concentrates on workspaces with cheap price and/or flexible availability. Such spaces are single desks, shared rooms, temporary office rent, daily “hot-rent”, office apartments, studios and hubs among others.

Scheduling tool might be offered for a fixed price for lenders who want to regularly rent their premises and conduct reservation online.

Market
There is a potential demand of the service on the market. Service will suit best small businesses that are considering moving from housework to co-shared space. It might also attract hobby and non-profit groups.

Added value
Customer’s added value is in saving time and having less hassle. Service provides accurate, local search for rent seeker and a great listing tool for lenders. Lenders will also have a tool that will help them manage reservation online: this reduces administrative work and increases their rent income.

Financing
Service’s prototype is build voluntarily. For further development basic investment of around 15.000 € will be needed. Service is free to use. Key profit engines are yet to decide, but they might be in-search bits, advertisement, reservation tool fee 9 € /month and additional features. Monetizing strategy will be redefined after analyzing tangible user data.

Mission and vision
Service’s mission is to be a quality, trusted and well-known workspace search tool for small business and NPOs. Vision is to cover European market and reach around 3000 monthly deals by the end of the first six months.

Steps
Next steps are to collect a team, build a well-tested prototype, gather data through partnership and data crawling, collect investment and promote service for broader public.

Valeria Gasik
Spring 2011
IMKE, Tallinn University

About business plan
Creating concept for Toteuta.se (draft name, meaning do.it in Finnish) is a practical part of writers master thesis. Thesis studies lean online service concept creation. This business plan concentrates on reshaping the business idea, defying market need and providing next action steps.

1. Business idea

In the first business plan draft as well as in the presentation held at Creative Entrepreneurship lecture Toteuta.se was described as a service listing not only workspaces but also people looking for co-working and projects.

Initial idea was to offer service where in addition to finding rented workspace, people could find projects – i.e. create teams for some common cause – or other way around, teams or individuals with project ideas could look for missing group members.

Redefining the business idea

Digesting the questions raised after presentation and a fruitful discussion with a commendable mentor and a start-up entrepreneur made the idea change its direction.

Initial business idea	**Redefined business idea**
Target group: adults in the small creative business - artists, developers, planners, writers, organizers, students, hobby clubs, nomad workers.	Target: same
Main service points: • finding workspace • finding people • finding projects	Main service points: • finding flexible workspace

Main two reasons behind narrowing the scope:
1. Original idea was too vague to focus.
2. Such a service was not needed.

Initial business idea had lack of concentration. With more profound insight it became clear that for now it would neither easy nor wise to serve so many causes. Some of the features might be added later when there is a better understanding of what type of users this service will eventually attract.

Another reason behind giving up of the two other parts was that there is already a great range of services that help people in various creative fields to connect. For example Wreck A Movie (wreckamovie.com) is a community for filmmakers who want to collaborate on different independent video projects.

2. Market analysis

In this chapter I will briefly study current trends and habits on the market.

Valeria Gasik IMKE, Tallinn University
Spring 2011

Working small-scale

In the recent years self-employment and working in start-ups have gained popularity. High-speed connection, great availability of knowledge and various digital and physical tools had made working small-scale possible and easy. Micro-size companies (employing less than ten people) are pretty common. Small-scale businesses have also finally started to gain acknowledgment from legislation and political point of view.

Socializing and co-working

Generally, work is no longer considerate to be the epicenter of person's life. There have been many discussions about burnouts, stress and depression; cold-blooded and egoistic work style seen in the movie Wall Street in the late 80's did not paid off. From the early 2000 until recent years working alone at home was seen first as a luxury and later on as a standard for remote work. However, after working alone for a while many freelancers admit feeling that ambience at shared space is much more motivating that there own home.

In the past year there has been an uprising interest towards lean co-working: individuals gathering together at one location in order to accomplish a common cause or project or just to have a company of similar-minded people sharing the costs and bouncing ideas. This might indicate of upcoming trend of flexible co-working.

Hobbies and quality time

Downshifting movement rose against workaholism in the late 2007. After latest recession in 2009 many re-evaluated their goals in professional and personal life. Today people tend to value socializing and spending quality time with the hobbies they like.

Another interested tendency is that this new layback attitude together with online communities has enlightened artistic activity and returned many old-school craft hobbies back into fashion. Knitting, sewing, assembling, creating accessories, re-moderating, drawing, photographing and writing are popular hobbies. People also seem to like to do these projects together in small groups: this helps them to share material cost and makes it more fun. At the moment most gather at homes or attend events and workshops.

Freelancing

Rockstar and Freelancer Switch (2008) conveyed a global survey covering 3700 freelancer working in six different industries such as design, development and creative writing. Most of the freelancers were under 35 year old males, working in large cities either in US or Europe.

Half of freelancers worked part-time, which is also the most popular choice in small towns. Rural areas have most full-time freelancers.

Study's cross-section (Rockstar, 2008):

Intend to stay as freelancer	49,6 %
Top reasons to be a freelancer	Flexibility, creative control, work at home (58,1%)
Works at home	85 %
Works at office	Shared (7,9 %), Private (7,1%)
Feeling happier as a freelancer	Over 90 % (less: Illustrators, Video makers)
Self taught	46,1 %

Study (Rockstar, 2008) shows that freelancing in creative fields is a popular, motivating choice. Most of the survey answerers worked at home. Around 600 people worked at office. Large percentage of answerers was in their first or second year of self-employment.

Conclusion

There are many reasons why small-scale self-employed person would want to move from home to a shared space.

Need for social connection, based on colleague's answers and personal experience, occurs approximately after two years of solitude. Unless one's apartment is a hip loft in social center, at that time staying at home around the clock starts to feel like being in a box. For more extravert and social individual, boredom and need for social interaction and support might come ever earlier.

Finding a space and someone to share it with is however time-consuming and difficult. Many offices also want a long-time contract, which might frighten entrepreneurs that are "pretty ok" at being home. Some feel afraid of coming to a room when just in the beginning in their business. Tolerable home ambiance is also seldom seen as a reason to quit individual business – many just deal with. Offering a tool for finding flexible co-shared spaced can patch this problem.

Another market opportunity is in non-profit hobby groups and creative teams that would need the space only occasionally: hour for gathering, few hours for organizing a workshop or work on some task, a week for a small indie project and so on.

3. Competitor analysis

Service's main competitors are *online community marketplaces* that concentrate on small-scale listing. Below are few of know active examples:

AirBnB

AirBnB.com (2011) is not a direct competitor but it might easily become one if it starts offering office spaces in addition to their current service. AirBnB is a popular global search tool, which concentrates on finding apartments for short period. Apartment's prices vary from around 5€ - 250 € and types from shared room to entire homes. Money transaction goes through PayPal or credit card, which means that AirBnB works as an intermediate. Listing is free but AirBnB charges 3% of the total cost of the reservation to cover the cost of processing.

Shared Business Space

Share Business Space (Sharedbusinessspace.com, 2011) resembles GraigList with visuals. It is less appealing and has fewer features than most novel search sites but it has a great range of specific office types, including pop-up shops, photo studios and spaces for non-profit organizations. Listing is free for the first month; following listing costs 25 dollars.

Loosecubes

Loose Cubes (loosecubes.com, 2011) is a simple, map based search tool. Its main market is in US though map-based search makes it open for other markets as well.

Loose Cubes suits well small groups – teams or small companies with stable business; most of the rented spaces are middle-prized. Despite good outlook, service lacks some important search features and has hardly any office rent data in Europe.

Evenues

Eenues (Evenues.com, 2011) concentrates on meeting rooms, desk space, classrooms and even spaces. Users can search, compare and book rooms with credit card. Lenders can take advantage of online booking calendar. Mostly in US operating Evenues service charges 13% processing fee for successful deal, listing is free.

Liquid Space

Liquid Space (Liquidpace.com, 2011) is a location-based iPhone and iPad application. It is targeted to white-collar entrepreneurs. Service lists quality nearby workspaces that can be found and booked on the go, also for brief period of time. Service operates in US.

Desk space rentals

After latest recession in the early 2009 prices on office spaces became more affordable. Finding suitable, nearby workspaces was however complicated. This opened an online market for renting desks to self-employed freelancers. Desk space rent is offered for instants through websites such as Rentadesk.co.uk, Officeshare.co.uk and Deskspacegenie.co.uk. (Cavaglieri, 2010).

Most of sites are free or freemium – listing might cost certain amount of money in return for some additional features or greater visibility. Some community markets works as simple message platforms, others have a bigger role in the deal. For example Officeshare.co.uk charges a month's rental fee for any successful agreements. Desk Space Genie makes revenue on bidding, i.e. lifting up featured search results.

Conclusions

Most successful shared workspace online markets and intermediaries are based in UK and US. There might be however successful local services that do not appear in English search.

Frequently reoccurring features are location-based search, photos, customer reviews and detailed amenities, such as for instants whether the office have high speed wi-fi or not. Some popular services also provide phone customer service.

Based on data such as venue info, pictures, prices and conditions, services mostly target quasi-sustainable business. Most of spaces are clean and technically well equipped, quite stereotypical offices or lofty and cozy rooms. They seem to be particularly suitable for IT-project, planning, development and design, business meetings, consulting meetings and workshops. They are seldom good for artistic activity, displays, hobby clubs and other types of low-scale creative business and informal gathering.

Services revenue is mostly created through charging a listing fee or collecting a percentage of successful deals. Some applications offer addition services such as booking possibility and money transaction through a third party.

Other competitors

Other competing sources might be field related **forums** such as illustrator's Pingstate.nu or designer's portal Pixel.ee. When person is not familiar with such specific sites, he or she might start looking from **local public forums** such as Suomi24.fi in Finland.

Small business working especially in IT and economics might contact **hubs** like Garage48, **incubators** and **university labs** directly. Working in such places usually means that person or business is already somehow connected to the venue – for instants working in collaboration with university of participating in a start-up program.

With locale artistic activity in question one might find workspace also for instants by looking for information in the **newspapers**, **post boards** or simply by **asking around**.

Sometimes creative circles are tight and this sort of information pings between insiders without being posted online. Another tendency is to promote open spaces on **venue's own page**. For example art houses such as Fimbul (Fimbul.info, 2011) advertise soon to be open classrooms and workshops spaces only in their blog.

4. Customers

Service is targeted to two main use groups – tenants and lessors.

Target market

- Western Europe
- Test market in Scandinavia

Target groups

Renters

- Adults, approximately 24–50 year olds
- Need a space once or occasionally *or*
- Need a semi-permanent contract
    - Working in small-size creative business an participating in other creative activity:
        - Self-employed individuals
        - Start-ups, co-workers and small teams
        - Non-profit groups, such as hobby clubs

Lessors

- Space that is rented once or occasionally
- Space that is rented continuously but to various groups
    - Individual properties such as apartments
    - Studios, galleries
    - Production-spaces
    - Club rooms
    - Hubs, incubators
    - Office properties with spare desks

Possible users groups:

- Retailers, pop-up shops
- Small event organizations
- Temporary storage

Based on competitor research the most poorly served segments in the market in question are artists and non-profit groups that are looking for a temporary, suitable and affordable space.

From the other point of view lessors who lend art and craft workspaces are either highly popular are hidden from public. Hidden and idle spaces are for example community rooms in apartment buildings that are often empty, storage rooms that are suitable for creative work and schools during holidays. There are also hardly any tools for lender to let random visitors book the space online.

Redefining potential users

Outlining target groups is a good starting point for understanding the need of potential users. Basic conclusions help to define on an abstract level whether the site is aiming to appeal grown-ups or kids, men or women, informal socialization or formal interaction and so on. It is obvious that with Toteuta's target groups there is no need to invoke quality office brokers or white-collar folks working in Bank area in London.

But is there a way to clarify potential user groups and their needs on more detailed level? In online service design further steps are a highly debatable question. They can be roughly divided into two:

1. Intuition – doing nothing

   Some web service designers encourage simply following one's guts. This means design the service as quickly and well as possible; opening it to the public and only then starting molding and tweaking it after there is feedback, statistical data of users and a product that would appeal even more This model has worked well for Facebook, Twitter, Google and other major companies.

2. More research

   Another school supports idea of using tools such as surveys, discussions with stakeholders and usability testing. User-centered service design process is sometimes also supported with personas and scenarios methodology. Personas are "archetypal users of an intranet or website that represent the needs of larger groups of users, in terms of their goals and personal characteristics" (Calabria, 2004).

Toteuta.se is taking advantage mostly of the first approach, intuition.

Pros – Best scenario
There is a clear opportunity window. Profound potential customer research might close it before the service is even established. Another risk is that equation mark between guessed user groups and actual user groups might never appear. Many companies have found themselves in situation where online service became popular among others than they originally expected: emo-kids instead of graphic designers, 30-year old hipsters instead of 60-year wine lovers and so on. Designing on the go and serving actual needs might give service a great competitive advantage.

Cons – Worst scenario
Intuition might fail. Design and functions might not appeal to anyone. Competitors might take advantage of 'surface preparation' and create far more appealing service. People might reject using the service because they don't like it's image, they don't trust it, they would find it hard to use or maybe even because they don't see any added value in using it at all. Time might be wasted because of lack of understanding the market need.

Valeria Gasik
Spring 2011
IMKE, Tallinn University

5. Service

This chapter will cover initial concept of Toteuta.se.

Service description

Toteuta.se is an Europe-oriented online community market for small business workspace. Service will work on web, smart phones and tablets.

Main features

- Listing tool for
  - Renters
  - Lenders
- Automatic location detection
- Intelligent search with reactive search algorithm
  - Soft ranking
  - Domain related keywords
    I.e. “wi-fi, ventilation, tap, security, storage, etc.”
  - Comparison tool
- Scheduling and reservation tool for long-time renders
  - Web
  - Mobile
- Social connection
  - Renters can connect their profile to existing services
  - Ranking, commenting on spaces

Possible future features

- Inviting users to share a certain space
- Online-payment as in AirBnB

Added value

Renters	Lenders
Saving time	Reaching new market
Saving money on flexible contracts	Activating idle or unknown business
Hassle-free search	Reducing administrative work with scheduling and reservation tool
Motivation from accomplishment	Saving money on free listing

Marketing

Toteuta.se is a **differentiated** service**. Customers** will be given an easy, domain-oriented and community-driven marketplace for workspace listing.

Competitive advantage of the site will be in its target market (small-scale business), locative, reactive and domain smart search and affordable scheduling tool.

Main **promotion point** is web. Web marketing will be conducted via search optimization, social networks and partnership with relative sites such community pages. Service will also encourage users to participate in community by commenting, rating and spreading the message outside.

Google **advertisement** will be used if needed. Other advertisement and promotion channels might be local events, directs contacts and physical and virtual bilateral sponsorship. Service will push itself also to related media in order to get mentioned in tech and creative blogs, online newspapers and traditional media.

Valeria Gasik
Spring 2011

IMKE, Tallinn University

Organization

Service will be constructed in a group of 3–4 people: developer, designer, front-end developer and project manager who also handles marketing. Profits will be divided accordingly either with shares or salary, if service carries out well.

Finance

Investments
At the early stage, start-up needs to invest in volunteering work. Software development will take approximately four full weeks from four people. Service investments will be around 40–50 €, with extra cost will occur. Project prototype can be created using existing tools.

Later on, start-up will need to invest in:

- Office space, 400 – 500 €/month
- Salaries, 4 x 1.500 € = 6.000 € /month
- Administration, accounting 500 € /month
- Other fixed and variable costs such as hardware, marketing, pr 300 € / month
- Total 7.300 €

Revenues
Revenue model will be clarified after there is a solid understanding of user groups and their needs. Possible key profit engines could be:

Featured search Similar to Google Ads bits	3 € / week
Advertisement with Google Ads	App. 15 – 50 € /month for 1000 daily visitors
In-page advertisement	100 € / month
Reservation tool	
Monthly fee	9 €
Customization fee, one-time	15 €
Domain redirection, one-time	15 €

Break-even point
In the beginning, when work is voluntary, break-even point will be around 20 € / month (service costs). If company employs four people and opens an office, costs will rise to break-even point of approximately 7.300 € / month.

Example 1: 10.000 visits, 1.000 deals, 60 units of reservation tools, 30 units of other features.

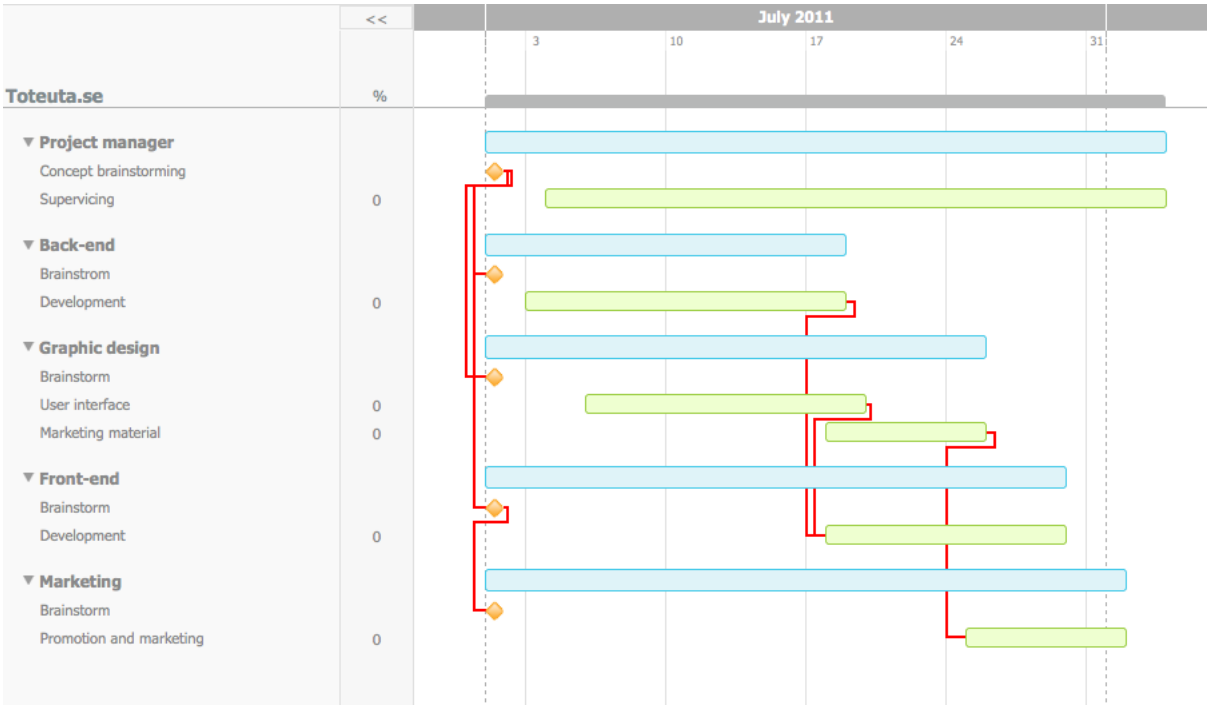
Reservation tool	60 x 9 € = 540 €
Customization and domain tools	30 x 15 € = 450 €
Advertisement	100 €
Google-ads	150 €
Total	**1.240 €**

Example 2: Break-event point

Reservation tool	390 x 9 € = 3.510 €
Customization and domain tools	235 x 15 € = 3.525 €
Advertisement	100 €
Google-ads	165 €
Total	**7.300 €**

6. Implementation plan

The most crucial part of the project is technical viability of the service. If service fails to work, users will not come back. Since resources are not large enough to create a massively operating service from the scratch, in the beginning the team of 3–4 members will need to build a prototype. Below is a simple Gantt chart of main steps and dependences.



Specific action steps

- Defining concept in details
- Forming a team
- Brainstorming; setting technical goals for prototype
- Outlining service features and content
- Designing
- Developing
  - Feedback
- Testing
  - Feedback
- Contacting partners, gathering renting data
- Going live
- Marketing, promotion
  - Feedback
  - Finding investors
- Further development

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Spring 2011

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Appendix D

iRent Project Plan

Tallinn University

IMKE / Institute of Informatics

Project Plan

Valeria Gasik

Tallinn 2011

Content

INTRODUCTION 3

1 PROJECT BACKGROUND 3

Business idea 3

Business idea development 4

Project model 4

Additions to project model: market research and design analysis 4

2 PROGRESS REVIEW 5

Project scope and objectives 5

Project delieverables and milestones 6

Resources 6

Architecture 6

Budjet 7

3 TIMELINE 7

Time sheet 7

Gantt chart 8

Podio 9

4 EVALUATION 9

REFERENCES 9

Appendix 1 – Technical development required during the iRent project

Introduction

This project plan was created and analysed for Project Management course, IMKE master program in Tallinn University's Institute of Informatics. The plan has a real life connection to the Aalto University/ACE (Helsinki) funded prototype project that started in the beginning of December 2011. It is also connected to a broader subject – a thesis that studies lean and agile concept design methodologies and practical online service prototyping.

The objective of the project plan is to reflect on real schedule, deliverables, milestones, budjed and project scope. Writer is also interested in practical micro-level planning, online tools and utilizing social networks for remote communication.

1 Project background

General information about the business idea, service objectives, target group etc.

Business idea

IRent (work title) is a dedicated meeting room booking service which:

1. Gives an ability to *find* a suitable meetng room with required amenities,
2. specify its *availability* on a certain time and
3. to make a *reservation/payment*.

"iRent" is a concept of an online information and reservation system with flexible prices balanced by demand and availability. The service *leasers* – property owners – can manage their rooms' occupancy by adjusting pricing and availability (as with airplane tickets). Service *users* will be able to easily rent meeting rooms according to their needs, on the go.

Market

Right now, it is really hard to not only find a suitable meeting room but also to deal with booking and paying for it. There is large number of empty and idle office spaces – for example in Helsinki metropolitan area now ~1,000,000 m2 is not occupied (~12.5%). This value is proportional to the meeting rooms' idle status. This trend has been continuing during last 10 years and rising an occupation rate is the main problem from property owners. Meeting rooms market is even more fragmented than offices, the information is destructured and marketing

conditions are somewhat obscure. Often potentially available rooms are 'hidden' and the service level is low: booking happens by phone or through sending e-mails and waiting for answers. Itn most cases it is impossible to book and pay for a meeting room on-the-fly.

Business opportunity

Properly organized leasing service could be a business opportunity also for spaces that are currently unused. For the office space average rent value of 20 €/m2/month, Greater Helsinki area property owners are losing 20M€ every month (potentially about a million euro a working day). This requires new on-demand and flexible renting system capable on increasing of the cash flow.

Main risks

Business idea is not uniq, there are many analog booking systems that are applied for different types of objects: hotels, hostels, plane tickets, gyms and even hair dressers. A large company, such as premesis owner (Teknopolis) or service prowider (Regus, AirBnb) might aquire such innovation quite fast. Risk prevention should be included into strong competive advantage (great usability, price, design) and differentation, that is applied from the early stage.

Business idea development

The first version of the business idea was evaluated in the course Creative Entrepreneurship in Spring semester 2011. The initial idea has changed drastically since, mostly based on feedback of business plan evaluation but also after several conversations with peers, friends and professionals in the field.

Project model

The project plan concerns a small scale online service prototype and might be described with *ADDIE* model. ADDIE is an abbrevtion for analyze, design, develop, implement and evaluate. The model is suitable for description since there are only two team members with sufficien experience and background, tasks are quite linear with rather clear sequence and there is a set scope for the prototype stage. Another traditional way to describe the project plan could be following: determination of requirements of the service, online service design, coding, testing and implementation. (Nomak, 2011.)

Additions to project model: market research and design analysis

I started this project plan description with a title "business idea". Project management and marketing are commonly tought separately – this I learn for instants during my business administration bachelor studies in HAAGA-Helia. As a designer I am also interested in aestetics, content, usability and user experience of the service; all usually mentioned but not emphasized in ADDIE -type of models.

For instants life cycle software development model sees that goal of *requirement*s stage is to " determine the functional specification of the system. Possibilities to use previously developed (sub)systems should also be taken into account" (Normak, 2011). Competitor and marketing research could be fit under but these type of actions are not specifically explained.

My personal background and interests together with the main competitive advantage of the business idea are the main reasons why I feel that ***relevant*** *design analysis* and *market research* should be visibly included into small scale planning. For this prototyping stage (based on initial idea evaluation) the strongest competitive advantage would be simple and clean design together with flexible and user-friendly pricing.

What would this mean exactly? Clean and simple design can be analyzed through competitor research, moodboards and best practice references; ideal pricing method though market and competitor research. Also service name and brand are important – background research for this is needed as well. ADDIE model would include these research questions under stage of *analysis*. In time line planning and descriptions I have also used term "*service design"*.

2 Progress review

Progress review contains description of project's objectives, delieverables, milestones, resources and architecture.

Project scope and objectives

Project outcome is a working prototype. Project's objectives are (in short):

1. Developing a working prototype with a proper GUI
2. Conducting user testing (usability, UX and feedback)
3. Evaluating market potential
4. Evaluation business opportunities in Finland and later abroad
5. Critical assessment of business modalities

Prototyping: A working prototype of the web service – the portal beta-version designed, developed and tested in the most common environments.
User testing: Along side of development process user testing will be conducted, preferably with service users and leaser clients. UX/feedback is included.
Market potential: The main goal for this project is to evaluate the market potential of the service through testing

concept and developed prototype with users and clients.

Business opportunities: The ways of business development will be evaluated (start up form, cooperation partners, potential investors, leading customers, IPR issues where relevant, risks assessment, etc.)

Business modalities: In the case of business establishment, the preferred modalities of the operations will be assessed (venture form, licensing, franchising, sales, ownership etc.) together with the entry and exit strategies.

Project delieverables and milestones

Milestones

week 52 / 5th project week	- Backend setup done - Wireframing done - First client contact made
week 8 / 13th week	- Initial graphic user interface completed - Front-end done - Two interview/test sessions made

Deliverables

week 3 / 8th week	- User interview conduction and feedback analysis
week 8 / 13th week	- User test B conductions and feedback analysis - Evaluation of the project - Evaluation of future actions

Resources

Project is conducted by a team of two person. Project resource plan is shown in Table 1.

Phase	Estimated work	Person
Project Management: Planning project; research	24 mh	Gasik
Implementation and testing	100 + 120 mh	
Service design (wireframing, design, layouts)	70 mh	Gasik
Service development	120 mh	Vaher
User testing (organization, execution, analysis)	30 mh	Gasik
Piloting: Feedback collection and processing	16 mh	Gasik
Summary and reporting	10 mh	Gasik

Table 1. Preliminary resource plan

Architecture

Detailed description of online service architecture is presented in Appendix 1.

Budjet

Project was given a funding of 5.000 € which is also a budjet for the prototype development. Details of budjet are shown in Table 2.

Salaries	1.700 € (brutto)
External services (outsourced development)	3.000 €
Travels	200 €
Other expenses	100 €
Total	5.000 €

Table 2. Budjet

3 Timeline

Project plan was build using following tools: Podio, Gantt chart and time sheet.

Time sheet

Time sheet (Figure 1) was composed after defining project objectives and needed phases.

	A	B	C	D	E	F
1	**Task / Week**	**48**	**49**	**50**	**51**	**52**
2	**Service planning**	Setting up Podio Project schedule Goals & Outcomes	Timeline Competitor research	Data research	Name	
3	**Wireframing**		Leaser's page	Leaser's page User's page	Missing views	Missing views
4	**Graphic layout**				Moodboard CSS solutions	Main page redesign Search views Booking
5	**Back-end**					
6	**Front-end**					
7	**Testing**			User questions		*User interview option date A*
8	**Pr**			*14.12 Futurice at 17* *15.12 Taik Demo 13-17* *15.12 Defa event 14*		
9	**Milestones**					Back-end set Wireframing done Contact established
10	**Deliverables**					

Figure 1. Screenshot of project's time sheet.

Schedule was first composed with post-it notes on a large white notepaper and then moved, with greater details, to sharable Google Document. This solutions allows our team to easily adjust timeline's content. I did not used iCal or other desktop applications, because they would not have synked with Kristo's computer.

Gantt chart

Unfortunately GanttProject that I installed on my computer did not worked well, so I builded Gantt chart online (https://teamgantt.com). This online tool gives possibility to create dependencies among resource's tasks and milestones (Figure 2) so it works in a similar way as GanttProject.

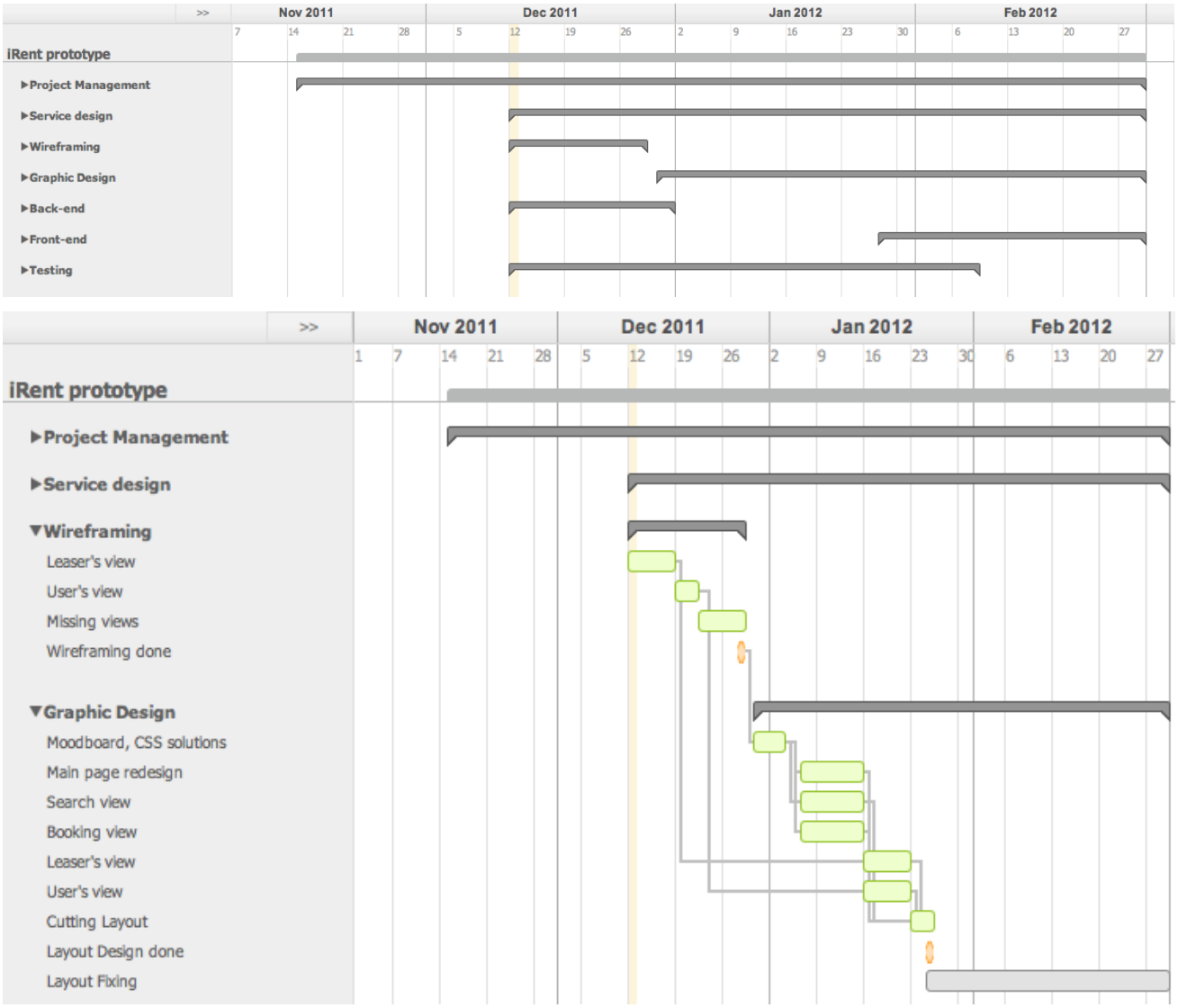

Figure 2. Project's Gantt chart created online (teamgantt.com).

Podio

For documentation and communication purposes our team will use free project management service Podio. Podio enables to create distinguishing departments and attach relative application, such as for example Bulleting list, Documents and Meeting Calendar in "Project planning".

4 Evaluation

Real project evaluation will be conducted at the end of February 2012 accordindly to the set objects (Chapter 3).

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Appendix 1 **Technical development required during the iRent project**

Setup

- Setting up web server, possibly a virtual hosting service from temporary service provider.
- Setting up web server settings for the project and testing suitability for the project. In relation to PHP and MySQL.

System Architecture

- Setting up web development framework for the project. Private framework, that is based on Model-View-Controller principles, is used.
- Setting up URL mappings for the prototype that assign functionality to specific URL's.
- Setting up translation files for the prototype.
- Setting up primitive model and view files and testing navigation and cache logic from system standpoint.

Database Architecture

- Mapping out required database tables in the context of prototype functionality.
- Rooms table design
- Renters table design
- Users table design
- Pictures table design
- Amenities table design
- Contact (feedback/questions) table design
- Comments table design
- Bookings table design

Functionality and User Interface Integration

- Home page integration
- Search bar functionality
- Search/List view
- Search/Pictures view
- Search/Map view
- Comparison pinning functionality
- Comparison view and functionality
- Registration/Login functionality for users
- Registration/Login functionality for renters
- Room view (pictures, map, calendar, comments, renter contact)
- Booking view
- Payment view
- Confirmation view
- Confirmation e-mails (generated HTML + sending)
- Adding a room functionality
- Adding pictures functionality
- Defining booking times and exceptions for booking times for rooms

Additional

- Double-booking checks and warnings
- Price calculation algorithms
- Security enhancements to protect from XSS and injection attacks.

Appendix F

Quatified AttrakDiff Single Evaluation Test Result Data

Appendix – Quantified AttrakDiff Single Evaluation Survey Result Data

	renter	**leaser**	**-3**	**3**			**Renter**	**Leaser**	**Renter**		**Leaser**	
Q #	value	value	low	high		category	value, %	value, %	mean	stdev	mean	stdev
1	0.32	1.51	technical	human	Pragmatic Q	humanity	55	75				
2	0.69	2.01	complicated	simple		simplicity	62	84				
3	1.69	2.01	impractical	practical		practicality	78	84				
4	1.67	0.23	cumbersome	straightforward		straightforwardness	78	54				
5	0.67	1.5	unpredictable	predictable		predictability	61	75				
6	0.67	-0.01	confusing	clearly structured		clarity	61	50				
7	1.67	0.25	unruly	manageable		manageability	78	54	**67.6**	**9.9**	**67.9**	**14.7**
8	1.67	0.02	isolating	connective	Hedonic Q – Ident	connectivity	78	50				
9	2.01	2.04	unprofessional	professional		professionalism	84	84				
10	1.7	1.72	tacky	stylish		style	78	79				
11	0.32	-1	cheap	premium		value	55	33				
12	1.69	-0.25	alienating	integrating		integration	78	46				
13	0.66	1.5	separates me	brings me close		bringing me closer	61	75				
14	2.03	0.01	unpresentable	presentable		presentability	84	50	**74.0**	**11.2**	**59.6**	**19.4**
15	1.74	1.49	conventional	inventive	Hedonic Q - Stim	inventiveness	79	75				
16	2.03	-0.03	unimaginative	creative		creativity	84	50				
17	2	0.73	cautious	bold		boldness	83	62				
18	1.67	1.73	conservative	innovative		innovation	78	79				
19	1.34	-0.75	dull	captivating		captivity	72	38				

Appendix – Quantified AttrakDiff Single Evaluation Survey Result Data

20	0	-1.75	undemanding	challenging		challengability	50	21				
21	1.34	1.24	ordinary	novel		novelty	72	71	**74.1**	**11.6**	**56.3**	**21.4**
22	2.03	2.23	unpleasant	pleasant	Attractiveness	pleasantness	84	87				
23	2.03	0.03	ugly	attractive		attractivity	84	51				
24	2.03	2.54	disagreeable	likeable		likeability	84	92				
25	2.03	0.02	rejecting	inviting		inviting	84	50				
26	1.65	2.27	bad	good		goodness	78	88				
27	1.34	-0.28	repelling	appealing		appealing	72	45				
28	1.33	1.74	discouraging	motivating		motivating	72	79	**79.6**	**5.5**	**70.4**	**20.7**

AttraDiff question data was presented in the range of -3 to 3. These values were converted to percentages for comparison.

Appendix E

Usability Test and Interview Templates for “Renters” and “Leasers”

E1. Template for “Renters”

E2. Template for “Leasers”

Participant: **Date:**

RoomForIt.com

Testin rakenne / Test Structure

25 min haastattelu / interview
5 min palvelun esittely, ongelman esittely / introduction of service and test problem
25 min tehtävän suorittaminen / completing task
5 min yhteenveto / wrap-up

Demograafiset kysymykset / Demographics

Gender

Internet usage

Tavat ja prosessit - Nykyinen käytäntö / Habits and behaviors - Current situation

1. Minkälaisiin tilaisuuksiin olet varannut huoneita osana työtäsi? Esim. palaverit, seminaarit, luennot.
What type of meeting room bookings do you do as part of your work? Ex. meetings, seminars, lectures.

2. Mikä on ollut tilaisuuksien luonne? Esim. kesto, osallistujien määrä, palvelut?
What was the general nature of these meetings – duration, number of participants, additional services?

3. Miten usein varaat sinulle ennestään tuntemattomia tiloja (oman talon ulkopuolelta)?
How often do you book new meeting rooms (outside your facilities)?

En koskaan	Harvoin	Silloin tällöin	Usein
Never	Rarely	Occasionally	Often

3-A ...miksi/why?

3-B ... jos varaa uusia: Mistä ja miten löydät huoneita?
... if booking new rooms: How and with which tools you find rooms?

---

4. **Mitä työkaluja ja toimitatapoja käytät omien ja ulkopuolisten huoneiden varaukseen?**
   What tools and processes do you use to book rooms in your facilities and in other venues?

5. **Millaisia ongelmia olet kokenut huoneiden varauksessa?**
   What type of problems have you perceived with bookings?

6. **Milloin varaukset ovat onnistuneet mielestäsi huoneiten? Mitä tapahtui?**
   What was the worst experience with booking? What happened?

7. **... entäs mielekkäin?**
   ... what about the most pleasant?

Taustakysymykset / Background questions

Jos palvelu olisi helppo, varaisitko huoneet suoraan netistä?	**Kyllä**	**Ei**
If it would be easy, would you book meeting rooms online?	**Yes**	**No**
Jos olisi mahdollista, maksaisitko huoneesta samantien verkkopankissa tai kortilla?	**Kyllä**	**Ei**
If it would be possible, would you pay for the room with internet bank or credit card?	**Yes**	**No**
Jos varaus olisi helppoa, varaisitko enemmän ennestään tuntemattomia huoneita?	**Kyllä**	**Ei**
If it would be easy, would you try out more rooms that are not familiar to you?	**Yes**	**No**

TOINEN OSA

SECOND PART

Intro

Esitän seuraavaksi nettipalvelun, jonka olemme kehittäneet kolleegani kanssa. Näet edessäsi kuvista tehtyä hahmotelmaa. Kyse on siis demosta – osa napeista toimii, osa ei.

Pyydän sinua tekemään kolmea tehtävää järjestyksessä. Osoita sormella ruudulla mihin painaisit tai voit esittää klikkausta hiirellä. Edetään niin hitaasti tai nopeasti kuin haluat. Emme testaa sinun teknistä osaamista, eikä tässä ole vääriä vastauksia. Pyydän sinua myös ajattelemaan ääneen.

I will next introduce you a online service, that we designed together with my colleague. You will see a mock-up that is made of static images. It's a demo – some of the buttons work, some will not.

I will ask you to do three tasks in an order. You can point to the screen or pretend that you click on something with a mouse. We will move as slow or fast as you wish. There is no wrong answers and we are not testing your technical skills. I will also ask you to think out loud.

Participant: **Date:**

T1: Löydä palaverihuone saunalla Helsingistä. / Find a meeting room in Helsinki with sauna.
T2: Tutustu huoneen lisätietoihin ja sijaintiin kartalla. / Get familiar with room's details and location on the map.
T3: "Varaa" huone. / "Book" the room.

Sivunäkymä - View

Aloitussivu / Landing page

Hakusivu, listaus / Search page, list view

Hakusivu, listaus lisätiedoilla / Search page, list results with details

Hakusivu, kuvat / Search page, picture view

Hakusivu, kartta / Search page, map view

Huoneprofiili - Room profile

Huoneprofiili (ensivaikutelma) / Room profile (first impression)

Huoneprofiili, huone varattu / Room profile, room taken

Huoneprofiili, kuvat / Room profile, picture view

Varausprosessi - Booking process

Varaus, tilauksen tiedot / Booking, filling in details

Varaus, maksutapa / Booking, payment selection

Varaus, ongelmatilanne / Booking, error

Varaus, kuitti / Booking, receipt

Muistiinpanot / Notes

Participant: **Date:**

RoomForIt.com

Testin rakenne / Test Structure

25 min tehtävän suorittaminen / completing task
25 min haastattelu / interview
5 min yhteenveto / wrap-up

Demograafiset kysymykset / Demographics

Gender

Internet usage

Tavat ja prosessit - Nykyinen käytäntö / Habits and behaviors - Current situation

1. Minkälaisia tilaisuuksia tiloissanne järjestetään? Esim. palaverit, seminaarit, luennot.
What type of events are organized in your facilities? Ex. meetings, seminars, lectures.

2. Mikä on ollut tilaisuuksien luonne? Esim. kesto, osallistujien määrä, palvelut?
What is the general nature of these meetings – duration, number of participants, additional services?

3. Kuinka usein varaaja on ensikertalainen?
How often person booking a meeting room is reserving it for the first time?

En koskaan	Harvoin	Silloin tällöin	Usein
Never	Rarely	Occasionally	Often

4. Mitä työkaluja ja toimitatapoja käytätte huoneiden varausprosessiin? Esim. puhelin, email.
What tools and processes do you use to book rooms in your facilities and in other venues? Ex. phone, email.

5. **Millaisia ongelmia olet kokenut huoneiden varauksessa?**
   What type of problems have you perceived with bookings?

6. **Milloin varaukset ovat onnistuneet mielestäsi huoneiten? Mitä tapahtui?**
   What was the worst experience with booking? What happened?

7. **... entäs mielekkäin?**
   ... what about the most pleasant?

Taustakysymykset / Background questions

Jos palvelu olisi helppo, hallinnoisitko huoneiden vuokrausta netissä? **If it would be easy, would you manage meeting rooms online?**	**Kyllä** **Yes**	**Ei** **No**
Jos olisi mahdollista, haluaisitko että huoneesta maksettaisiin etukäteen verkossa? **If it would be possible, would you like to receive payments online?**	**Kyllä** **Yes**	**Ei** **No**
Jos olisi mahdollista, haluaisitko että huoneesta lähetetään automaattinen lasku? **If it would be possible, would you like clients to receive automatic invoice after booking?**	**Kyllä** **Yes**	**Ei** **No**

TOINEN OSA

SECOND PART

Intro

Esitän seuraavaksi nettipalvelun, jonka olemme kehittäneet kolleegani kanssa. Näet edessäsi kuvista tehtyä hahmotelmaa. Kyse on siis demosta – osa napeista toimii, osa ei.

Pyydän sinua tekemään tehtäviä järjestyksessä. Klikkaa kohtia hiirellä tai osoita sormella ruudulla kohtaan, mihin painaisit. Edetään niin hitaasti tai nopeasti kuin haluat. Emme testaa sinun teknistä osaamista, eikä tässä ole vääriä vastauksia. Pyydän sinua myös ajattelemaan ääneen.

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Participant: **Date:**

T1: Lisää uusi huone palveluun / Add new room to the service.
T2: Muuta su 22.12 aukioloaikaa ja hintaa. / Change price and opening hours on 22.12.
T3: Katso 28.10 varauksen lisätiedot. / Check the details reservation on 28.10

Sivunäkymä - View

Uusi huoneprofiili - Add new room profile

Lisää huone / Add room

Rekisteröidy/kirjaudu / Register/sign in

E-mail

Etusivu

Huoneet - Rooms

Huoneiden etusivu / Room's main page

Kalenteri / Calendar

Varaukset - Reservations

Varaus, listaus / Booking, list

Varaus, lisätietoa / Booking, additional listing

Muistiinpanot / Notes