Lean Design for Good User Experience

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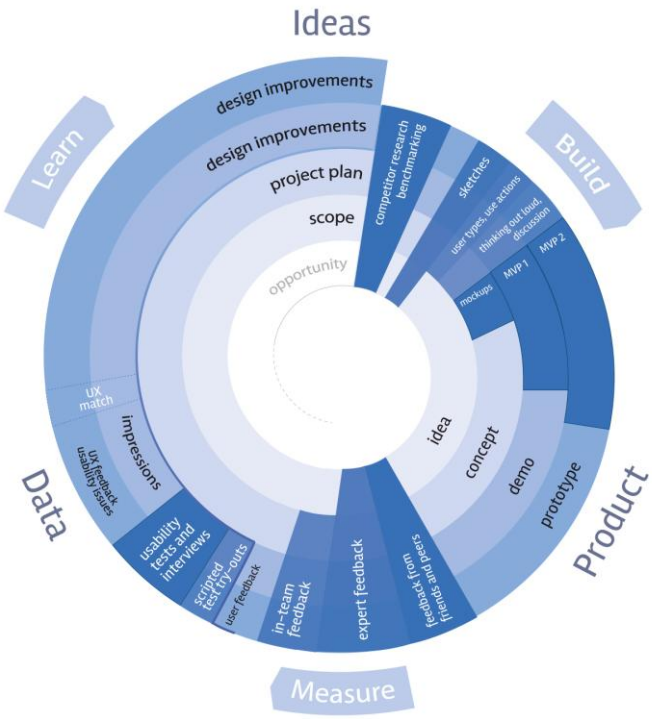

Figure 1. The Lean spiral [3].

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 the work herein described, 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; the second question was whether and how Lean principles could guide this design process. Results support the proposition that applying Lean principles for designing online services facilitates the achievement of good user experience. As an outcome, the outlining of an overall framework for using Lean principles in the implementation of similar projects is proposed.

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Lean; user experience; transfer

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H.5.2 Information interfaces and presentations (e.g., HCI); User Interfaces; User-centered design

General Terms
Lean, User Experience

INTRODUCTION

This work explores the idea of achievement of a *good user experience* in the context of the design and development of **Roomforit.com**, a localized online service concept for meeting rooms booking. The described research was 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; and

2. Design process of such potentially valuable concept could benefit from Lean principles.

Based on these assumptions, the following research problems were formulated:

1. What approaches could be used to support designing for good user experience in the context of the selected project?

2. How can Lean principles guide design process of this project?

USER EXPERIENCE

Based on the literature review [e.g. 12, 15] several approaches could have been selected to support the design and development for positive UX as well as assessment of the perceived UX of **Roomforit.com** concept. For instance Roto et al. [15] have collected over 80 methods for designing for *User Experience (UX)*, which were categorised, among others, by type, development phase, information provider and the length of period when user experience is studied. The selection of right approaches depends on the level of decision-making, scope of interest and time frame of the reflection. It is clear that all aspects of a service could not have been applied in the framework of the project herein reported; it is even arguable whether one should do so in any other practical case. Rohner [12] 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. What could be withdrawn from Roto, Law, Vermeeren & Hoonhout [14], Jetter and Gerken [8], Hassenzahl [6] 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 can not provide everything to everyone but it might provide good settings to support most important user experience factors, e.g. Roto et al. [15] summarised: ”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.”

In the light of the new online service concept **Roomforit.com**, outlining these critical UX factors, designing for contemplated, crucial UX facets as well as finding and applying relevant assessment approaches was part of the overall design process. This process was balanced with project’s business interests such as operating with a scarce budget and outlining suitable revenue models. As such goals are seldom regarded as main interaction design objectives, business aspects were studied from Lean principles’ perspective.

LEAN

Designing with Lean principles refers to searching ways to provide great customer value with efficiency but without compromising product quality. Lean was a namesake given in US in the late 1980’s to the concept of *Toyota Production System* (TPS) — a set of principles, which were iteratively shaped over a course of several decades.

According to the literature [e.g. 10, 17] TPS have been interpreted both as guiding principles (e.g. poka-yoke, kaizen) and a set of practical approaches (e.g. Kanban, 5S), aimed to solve the ancient question of creating value with efficiency. Lean, originating from car manufacturing, has often been systematised and occasionally codified to serve better the needs of other fields. Through time, Lean principles has been picked up and tuned by various industries including service, software development and most recently — project management and entrepreneurship oriented Lean startup. The main principle of Lean, derived from TPS, has not changed over time, although new or renovated approaches have been suggested, i.e. Kanban approach in Lean software and developing for *Minimum Viable Product* (MVP) in Lean startup. 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. To avoid this, Lean has been suggested to be viewed as a starting point for organisations that will develop and obtain their own principles [e.g. 2, 10].

CONNECTING LEAN WITH USER EXPERIENCE

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 the focus of the design. Nielsen, Norman and Tognazzini [11] 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 [8]. 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.

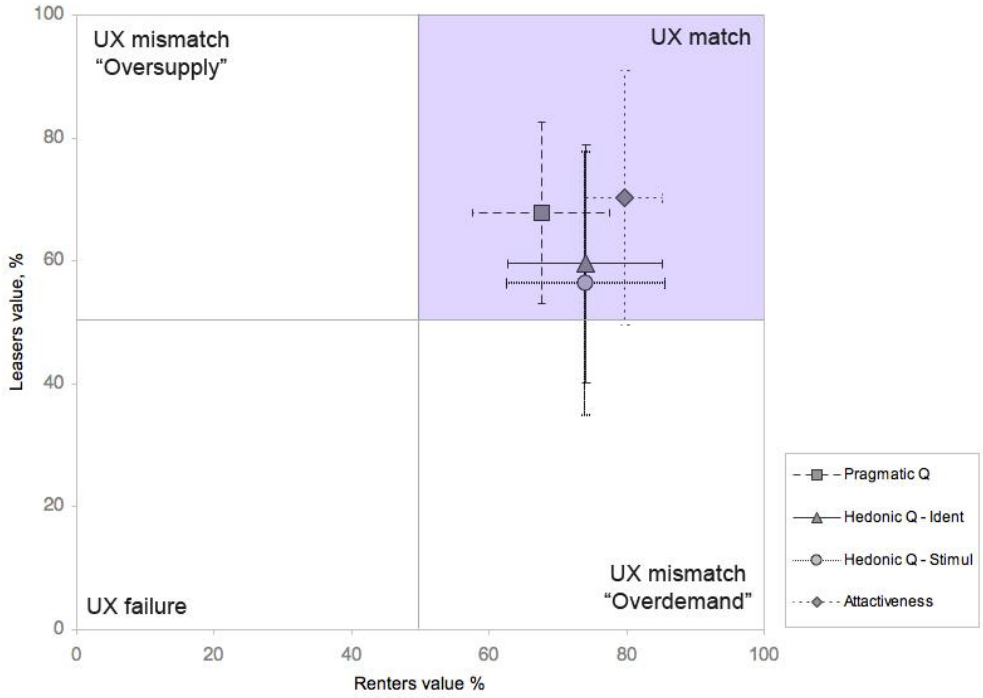

Figure 2: Comparison of perceived service quality values by renters and leasers. Data is based on two AttrakDiff [1] word pair Single Evaluation survey results. Error bars indicate standard deviations within 4 word pair categories (7 word pairs in each). UX match (colored top right square) means that both sellers and buyers would likely to use the service in terms of all analyzed quality and attractiveness criteria. [3]

Designing for good user experience and designing with Lean ideology both require experimental iteration and as Ries [12] 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.

THE PROJECT

Roomforit.com is an open marketplace for listing and renting meeting rooms. This online service concept was introduced in the design research through inspection of four phases — idea, concept, demo and prototype. Reflection focus was set on the selected UX approaches and Lean principles, i.e. attention to customer value, recognizing and redesigning out *waste* as well as validated learning in terms of building MVPs and evaluating them with relevant UX assessment methods. The process is inspected in the Lean spiral, Figure 1. Figure is based on iterative Build-Measure-Learn cycles [3].

The first phase describes devising of the strategic business idea. Benchmarking, competitor research and sketching, among others, supported formulation of business proposals that were reflected with feedback from experts and friends. Re-assessment through the lens of Lean supported finding a feasible direction for the project, i.e. seizing limitation based on available resources as well as focusing on the most relevant needs of users in the light of this potential business.

The concept phase covered more detailed examination of the business idea, supported with various interaction design approaches, e.g. outlining user types and composing visual mockups as well as collecting more feedback. The focus set with Lean was acknowledged in derived strategical and pivotal changes, such as leaving hot desk renting out from concept's MVP, thus concentrating only on UX of renters and providers of meeting rooms.

Paper sketches, wireframes, *role playing* use scenarios and other approaches accompanied with collected feedback were employed in the third phase of designing a live demo, published for selected audience — the first MVP. For a holistic assessment of user experiences by both renters and users, second MVP with relevant mockups was created during the prototype phase.

Business insights gathered during concept and design phases led to strategical discoveries as well as systematic

recognition and reduction of *waste*. For instance during prototype phase, service's characteristic was tuned — **Roomforit.com** was repositioned from a mediating *middle-man* service to a platform that supports free communication between two main user groups. This change drastically the amount of design work needed for building second MVP mockups.

The critical UX factors of **Roomforit.com** concept were crystallised during demo and prototype phases. It was concluded that success greatly depends on a match of perceived good user experience by both groups, renters and room providers (leasers). Specific critical attributes, e.g. usable, credible and friendly, which were outlined with consistent benchmarking and feedback from peers and colleagues as well as practical design, were helpful for design orientation but trivial in the light of evaluating the overall success rate of the intended **Roomforit.com** concept values. Based on this understanding, UX assessment was done with six representatives, three from both group — renter's and leaser's. All individual meetings included scripted usability tests, targeted to assess typical usage tasks and AttrakDiff [1] Single Evaluation word-pair surveys, aimed at measuring attractiveness of the service in terms of usability and appearance. As AttrakDiff [1] visualisations did not clearly expressed the overlap and clustering of these two survey results, for more holistic analysis, data points were inspected in UX Match Matrix visualisation, described in the Figure 2 [3].

REFLECTION

As mentioned in the introduction, we focused our research questions on designing for good user experiences using Lean principles.

While usability tests and survey results showed evidence regarding overall positive UX, improvements and new evaluations have to be made in the future. For instance usability tests pointed out that there were no critical usability flaws, although participants were struggling with some of the tasks. Also some dispersion in AttrakDiff [1] 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 together with Lean principles and Lean startup approaches such as designing for MVP, 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.

The Lean spiral in Figure 1 [3] highlights frequently used approaches, most essential evaluation methods as well as products, data and ideas generated throughout design process of **Roomforit.com**. Graph is based on Lean startup model *Build-Measure-Learn*. The 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 the **Roomforit.com** project, most useful and used internal approaches to were benchmarking and competitor observation, sketching, low and medium-fidelity prototyping, written or orally communicated user actions and *thinking out loud about design* i.e. walking though use scenarios while *role-playing* a renter or a leaser. In-team feedback is presented in both, Build and Measure, sections: direct discussion was typically related to some details of design-in-progress, while feedback was closely connected to evaluation of design solutions that were already made.

External approaches that were done in collaboration with people outside the team included gathering feedback from friends, peers and domain experts. Secondary data of unstructured and contextual feedback was collected frequently throughout the whole process. Real user feedback was collected based on the live demo and clickable prototype mockups. 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.

Although selected 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 everyday problems of regular users. It is viable to note that retrospective analysis based on private 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, during the idea and concept phases one person did most of the work of *UX researcher* [9] — this had a limiting impact on the efficiency of the process.

Some of the design means visualised in the Lean spiral (Figure 1) might be debatable. For instance *thinking out loud about design* and "role-playing" users were not mentioned in the literature and thus could be considered as not directly related to UX approaches or Lean principles. In terms of Lean, for instance Seddon and O'Donovan [16] pointed out that even if some Lean approaches are not listed they should not be considerate irrelevant. In the perspective of UX, e.g. Goodwin [5] proposed innovative UX evaluation methods during design process. Theatre and drama as part of design process has been also discussed by experts in the neighbouring field of service design [e.g. 4, 7]. During the project, talking out loud about design and discussing details with the team resulted in many insightful thoughts.

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 principles, which, in contrast, seem to prefer iterative perfection and quality over speed. Real user feedback was collected only on high fidelity mockups and live demo, not earlier. It was rationalised 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 rationalisation 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 and 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 important.

Roto, Law, Vermeeren & Hoonhout [14] 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 life. 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 will continuously occur when service is published and used in a the 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 Lean principles and adopted in Lean startup's model of *Build-Measure-Learn.* Such project values are thus likely beneficial also for the future development.

While this work does not suggest the adoption of precise sequence and combination of project's approaches in other online service conceptualization projects, principles and components presented in the spiral (Figure 1) could work as discussion mobilizers in similar works. The UX Match (Figure 2) concept could be beneficial for comparison of two or more important user groups, securing a better potential success of similar online services.

CLOSING REMARKS

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. Integration of Lean with designing for good UX is possible and such overall concept could be extended on any relevant service development. The spiral (Figure 1) can support build-up and development of any such typical project. The UX Match concept (Figure 2) can support evaluation result comparison of two or more user groups.

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