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Adapting Lean User Experience Process for Enterprise Environment

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Anpassning av lean användarupplevelse processer inom företag

SAMMANFATTNING

Företagsinterna simuleringsbaserade mjukvaruverktyg är komplicerade att använda. Komplexiteten kan minskas genom att utforma god användarupplevelse (UX), genom att göra gränssnittet användarvänligt och mer effektivt för de anställda. Men att designa för god UX i ett innovationsprojekt är svårt. Denna studie har tillämpat Lean UX - en användardriven process som utarbetats av Gothelf. Processen anpassades för att passa utvecklingen av en intern simuleringsbaserad programvara på Ericsson. Resultatet av studien beskriver hur processen anpassades och vilka utmaningar som påträffades. En utmaning med studien var den avancerade teknik nivån för detta projekt. En annan utmaning var den komplexa organisationsstruktur och dess användare. En tredje utmaning var ledningens begränsade förståelse för vad UX står för. Studien visar, att även om det är svårt, kan Lean UX processen anpassas för intern företagsmiljö. Själva processen var endast delvis anpassad, det sätt på vilket processen tillämpas kräver mycket kraft. Utmaningarna diskuteras vidare utifrån Nielsens Corporate UX Maturity Model.

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ABSTRACT

Internal enterprise simulation-based software tools are complex to use. Complexity can be reduced by designing for good user experience (UX), making the interface user-friendly and more efficient for employees. However, designing UX in an innovation project is tricky. This study applied Lean UX – a user-driven process elaborated by Gothelf (2013). The process was adapted to fit the development case of an internal simulation-based software sales-tool at Ericsson. The results of the study describe how the process was adapted and what the challenges of it were. One challenge of the study was the advanced engineering level of this particular project. A second challenge was the complex organizational structure and its users. A third challenge was the management's limited understanding of what UX stands for. Therefore, the study concludes that even though it is challenging, the Lean UX process can be adapted for enterprise environment. Whilst the process itself was only slightly adapted, the way the process is applied takes many efforts. The challenges are further discussed from the perspective of Nielsen's Corporate UX maturity model.

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Internal enterprise simulation-based software tools are complex to use. Complexity can be reduced by designing for good user experience (UX), making the interface user-friendly and more efficient for employees. However, designing UX in an innovation project is tricky. This study applied Lean UX – a user-driven process elaborated by Gothelf (2013). The process was adapted to fit the development case of an internal simulation-based software sales-tool at Ericsson. The results of the study describe how the process was adapted and what the challenges of it were. One challenge of the study was the advanced engineering level of this particular project. A second challenge was the complex organizational structure and its users. A third challenge was the management’s limited understanding of what UX stands for. Therefore, the study concludes that even though it is challenging, the Lean UX process can be adapted for enterprise environment. Whilst the process itself was only slightly adapted, the way the process is applied takes many efforts. The challenges are further discussed from the perspective of Nielsen’s Corporate UX maturity model.

1. INTRODUCTION

Enterprise software tools are powerful, yet complex (Sherman, 2008; Finstad et al., 2009). Complexity and cognitive load demanded from employees influence their efficiency, which results in extra costs for companies (Bias and Mayhew, 2005). There are several reasons why internal enterprise tools lack a good UX. One of them is that enterprise cost centers evaluate success according to savings in budget and not to maximization of effectiveness for their employees (Kelsey, 2015). Therefore, internal software tools are one area where costs are cut. Another reason is the prioritization of additional functionality instead of improvement of current UX (Cao, 2015). This is caused by software design around business requirements, opposed to employees’ needs. A third reason is that there is no competition for internal software tools. This fosters resistance to change. Improvements and experimentation are not prioritized (Kelsey, 2015). However, in 2013, Steve Blank (2013) argued that internet technologies generate disruption amongst several industries and push organizations to rethink their practices and existence. As such, the strategic importance of UX and innovation is increasingly acknowledged and becomes an important differentiation

factor in marketplaces (Maiden, 2015). In the digital era, innovation is inspired by small focused user-driven startups that create better alternative solutions through good UX design. Enterprises looking to increase employees’ efficacy with innovative, yet user-friendly software tools, should unquestionably consider a user-centered design (UCD) approach to the development of those (Mauro, 2002). The benefits of UCD have been proven several times and it is especially relevant in the age of information (Bevan and Macleod, 1994; Bias and Mayhew, 2005).

Ericsson is a big telecommunication enterprise operating in a dynamic environment, where change must be embraced. In this sense, the company promotes innovation within the company. However, due to the massive organization size and its complex structure, driving internal qualitative improvements is challenging, despite innovation being a priority. This is partially because of limited expertise in UX design and lack of advocates to promote design of software tools around user needs.

Employees at Ericsson working at the Technical Sales Support (TSS) Department operate complex simulation-based software that can be used to evaluate and compare the performance of various telecommunication products, configurations, and deployment options. The software was created for R&D purposes and handling it requires a deep technical understanding. Consequently, it is limited to only a few employees. However, colleagues in sales teams from different regions around the world could benefit from the capability of the software. It could help them effectively communicate solutions and estimate the costs for the customers. It would eventually increase the volume of sales. Unfortunately, this is not possible due to the advanced technical nature of the software. It is difficult to operate and it often requires resources to train employees. A potential solution to fix this would be to design purpose-tailored tools according to sales teams’ needs, opposed to the one-fits-all software tools.

For this purpose, an improvement project was initiated. The goal of this project was to research users and their sales process and to improve the UX by redesigning the interface of an existing simulation software tool. Since no other publically available examples of such tools are available, designing the tool involves dealing with risks and many

uncertainties. For this purpose, a relatively new process to designing solutions based on a user-centered approach was employed – Lean User Experience (UX). This design process is intended to manage risks and uncertainties by validating design assumptions through experimentation and iterations. A team of three master students and one Ericsson employee carried out this project. However, each of the students had a different research scope. The Lean UX design process helped the research team to understand the users, their needs and the constraints related to their activity. Whilst it is mainly intended for startup-based product development, this thesis explores its applicability in an enterprise environment. Therefore, the thesis sets to answer the following question: **How to adapt the Lean User Experience process for designing internal simulation-based software tools in an enterprise environment?** To answer the question, the case of Ericsson simulation-based software tool has been considered. Since the process is applied for a different purpose than it was intended, small adaptations have been made. The thesis reflects on the results of the case study, the challenges of the research team during the process and the impact of the Corporate UX Maturity model (Nielsen, 2006) on the process itself. The challenges are discussed and suggestions to overcome them are given.

2. THEORY AND RELATED RESEARCH

Introduced by Gothelf (2013) as an alternative design process for development teams, Lean UX applies Lean Startup principles to improve UX for innovation projects. However, previous scientific research on the specific topic of Lean UX in enterprise environment is very limited. Therefore, this section briefly discusses what is User Experience and Lean Startup, the relationship between the two, and the Corporate UX maturity model of Nielsen (2006).

2.1. User experience (UX)

According to the International Organization for Standardization (2010), usability is defined as “*the extent to which a system, product or service can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use*”. However, reducing design to factors that can be measured under task efficiency and learnability takes away the quality and experience of interactive products (Whiteside, Bennett and Holtzblatt, 1988). To depart from usability-oriented design, the term of UX emerged (Hassenzahl & Tractinsky, 2006). The International Organization for Standardization (2010) defines UX as “*person's perceptions and responses resulting from the use and/or anticipated use of a product, system or service*”. Meanings of UX are also researched in a variety of other forms, ranging from usability to aesthetical, hedonic (stimulation, identification, evocation) or affective aspects (Alben, 1996; Forlizzi and Battarbee, 2004; Thüring and Mahlke, 2007; Nielsen and Norman, 2011). Bargas-Avila and Hornbæk (2011) provide an overview on empirical UX studies. They make a distinction between studies that research non-instrumental needs and experience in a more

complex sense, and studies that reflect on design and use of user interfaces. In relationship to this classification, this thesis takes the second study approach. Therefore, in the context of this thesis, UX design represents “*new approaches to the design of interactive products, which accommodate experiential qualities of technology use*” (Hassenzahl, Diefenbach and Göritz, 2010).

UX has gained momentum in the recent years and Marcus (2015) claims that companies pay more attention to it. UX helps companies to differentiate themselves from competitors with products and services that are easy to understand, quickly to learn, and pleasant to interact with (Maiden, 2015).

Jetter and Gerken (2010) claims that successful UX provides a perfect equilibrium between value for end-users and value for the organization. Therefore, UX in an organization cannot be focused solely on the user, but it should be rather connected to the business interests of the company. In innovation projects, technical constraints play an important role on how UX is delivered. Therefore, UX in innovation projects resides at the intersection of users’ needs and business goals as well as the technical constraints (figure 1).

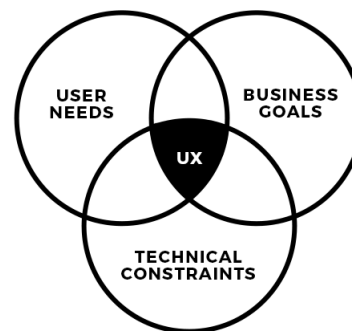


Figure 1: UX design for innovation projects. Adapted from: <http://www.interaction-design.org/>

There are designing guidelines for good UX (Hartson and Pyla, 2012) and literature for evaluation methods of UX (Tullis and Albert, 2008). There are also many practical resources for UX design on websites, blogs and discussions on forums. However, there is little scientific research on UX design processes for software development of innovation projects in enterprise. Lean Startup is one approach to innovation projects and Lean UX is connected to it. Therefore, the next section will describe Lean Startup.

2.2. Lean Startup

Eric Ries builds on and extends lean principles to introduce Lean Startup – an approach to innovation driven by users (2011). Lean principles originate from Toyota’s philosophy of optimizing production processes by eliminating waste (Liker, 2014). Waste in Lean Startup context represents expenditure on resources that does not add any value to users. To minimize waste, the startup has to check continuously its vision with users. Therefore, the Lean Startup approach employs an iterative process to the development of products

and services: Build-Measure-Learn. The goal of the process is to learn from users using a Minimum Viable Product (MVP). A MVP is a product with minimal features created to gather validated learning about the product and its continued development (Ries, 2011). It reduces the amount of resources invested on an idea and helps the team make decisions based on users' feedback (Ries, 2011). Lean startup, as its own name suggests, is mainly intended for startups, but it started to be applied as well for projects in enterprise contexts (Blank, 2013).

2.3. Relationship between Lean and UX

Whilst Lean Startup originates from business studies, it also incorporates concepts from UCD. Mueller et al. (2012) provide an ample comparison and suggest that there is a connection between UCD and lean principles. One distinct evidence is that both place users at the heart of their design decisions. However, the main difference between UCD practices and the Lean Startup principles is that in Lean Startup the vision for the product is set by company founders and research is considered after users interact with the MVP. The MVP is developed in small iterations and it continuously evolves using feedback from users.

2.4. Lean UX

Lean UX is a methodology introduced by Gothelf (2013). It applies the Lean Startup principles of Ries (2011) for UX design. Instead of talking about requirements and documents, the methodology implies a multidisciplinary team that frame discussions around solving problems by delivering desirable experience for users that fit the business goals (Gothelf, 2013).

2.4.1. Lean UX process

The Lean UX methodology describes an iterative process (figure 2) which consists of four steps:

1. Declare assumptions
2. Create a MVP
3. Run an experiment
4. Receive feedback and research

The process is illustrated below and a brief description of each of the steps is further provided.



Figure 2: Lean UX process. Adapted from Gothelf (2013)

During the first step, the team states the problem, lists assumptions and then prioritizes them based on their level of risk. The more uncertainties an assumption involves, the higher the risk and, therefore, it receives a higher priority (Gothelf, 2013). The team then formulates hypotheses from the prioritized list of assumptions. A typical hypothesis involves outcomes (the results expected from the users), proto-personas (best guess of potential users) and features (ways through which personas achieve the desired outcomes).

The second step in the process is to create a MVP. It helps test assumptions and thus, minimizes the work required to identify the optimal solution. In Lean UX, a MVP is typically a prototype (paper sketches, clickable wireframes, etc.), but not necessarily. Gothelf (2013) suggests that the team should create MVPs that collect relevant data to answer a given hypothesis. Therefore, MVPs could also be an email, interview, button to nowhere (Gothelf, 2013). It has to be created as quickly as possible, yet deliver enough material in order for potential users to be able to reflect and give feedback. There are two focuses for MVPs. The first focus of a MVP is to maximize learnings for the design team, whilst the second is to provide minimal value for users and measure how they react to it.

The third step of the process is to run an experiment using the MVP. The goal of the experiment is to deliver feedback for the team to base design decisions on.

Lastly, the fourth step is collecting the feedback and the analysis of it. The results of the experiment inform the team whether a hypothesis about an assumption was correct and if the assumed direction should be further pursued, refined or abandoned (Gothelf, 2013). In the next iteration, the team updates their assumptions and creates new experiments to further understand the matter.

2.5. Corporate UX maturity

Poorly designed tools for employees indirectly affect the customer experience, which reflects back on the company (Bias and Mayhew, 2005; Finstad et al., 2009). However, the management often has a vague understanding of what UX stands for. Therefore, UX professionals face challenges and lack support from their organizations for UX-related activities, such as user research or usability testing (Holtzblatt, Barr and Holtzblatt, 2009). Nielsen (2006) has documented this phenomenon as a model named *Corporate UX Maturity*. The model represents a set of UX maturity stages that enterprises typically progress through, ranging from “hostility toward usability” to “user-driven corporations” (figure 3).

Liikkanen et al. (2014) reflect on their experience with the Lean UX process in a software development project for a customer. Their main struggle was to embark the project owner to adopt a new way of working. Therefore, the Corporate UX Maturity model is used in this thesis to reflect on the use of Lean UX process in the enterprise environment.

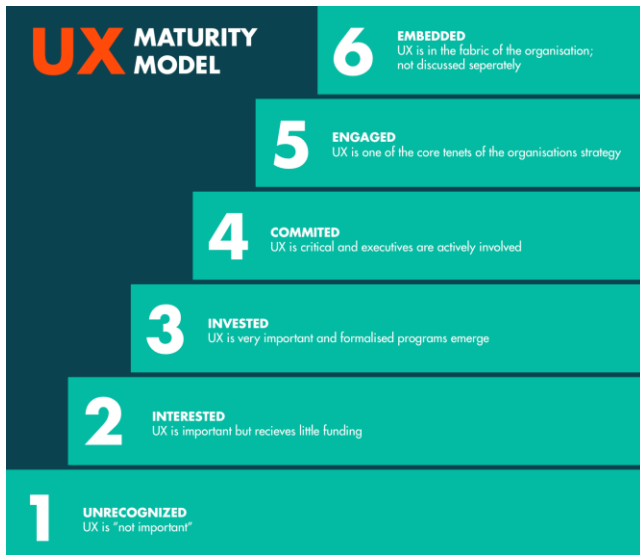


Figure 3: Representation of the Corporate UX maturity stages updated by <http://www.inuse.se/>

3. METHOD DESCRIPTION

The research method of the thesis is a case study analysis of the indoor simulation-based sales software tool. A brief description of the case as well as of the software tool is presented in the opening of the results section. The goal of the thesis is to provide a reflection on how the Lean UX process can be adapted for an enterprise environment. The reason for choosing a case study is the inability to study the design process in isolation without applying it in practice.

The study is following the Lean UX process proposed by Gothelf (2013). However, the author mentions that the examples provided along with the process should serve only as a guideline. Rather than following the process exactly as it is described, he recommends to experiment and adjust the process to fit the needs of the project.

The research also takes into consideration other contextual aspects, such as organizational, strategical and technological. The study reflects on the impact of these aspects on the overall applicability of Lean UX process using the Corporate UX Maturity model of Nielsen (2006).

The study took place during a five-month period at Ericsson. The study was part of a bigger project that involved other research members. The research team consisted of four members. It included one user researcher and front-end developer, one back-end developer, one domain expert and back-end developer and me as an UX designer and Lean UX facilitator.

A prerequisite for employing the Lean UX process is that the whole research team has to be familiar with the Lean UX process. Therefore, as soon as the team was ready to start the project, a workshop was lectured to introduce the principles and the process of Lean UX.

Due to the big scope of the project and the limited amount of time for research, this master thesis does not provide a solution to the case nor does it assess the quality of the UX. Therefore, the study provides only a reflection on the design process proposed by Gothelf (2013) and adapted for enterprise environment.

4. RESULTS

As stated in the method section, organizational, strategical and technological aspects affected the results of this case study. Therefore, this section provides a description of the case study context. Later, an iteration of the Lean UX process applied for the case study is presented. Finally, the outcomes from the iteration are described.

4.1. Case study context

In order to comprehend the users and their challenges, the team had to explore their environment first. The research team was not familiar with the telecommunication domain of the case, nor with the enterprise environment. Another challenge for the research team was the big size of the enterprise scattered across continents and its organizational structure. Therefore, during one month and a half, the team acclimatized with the organization by interviewing local stakeholders, getting familiar with the sales strategies and products, participating in indoor case study analysis and observing users using the initial Ericsson indoor simulation-based tool, which is described in chapter 4.1.3. Further, the different aspects of the case context are briefly described.

4.1.1. TSS department

People working at the TSS department have the task to support sales teams around the world with methods and tools. The sales teams are clustered into so-called “regions”. Most of TSS employees have been working for the company for several years and have an engineering background with mixed business, marketing and sales skills. The ultimate goal of the TSS department is to convey their expertise through industrialized solutions for sales teams. This is to reduce the time of TSS employees spent on answering repetitive issues and to enable the TSS department create solutions for more complex scenarios. However, the TSS department lacks design skills. Therefore, the software tools developed by TSS does not guarantee the desired usability level for sales teams from the regions. Given their sales background, the teams in the regions are not technically skilled and, therefore, the tool has to be user-friendly, so that they get their jobs done as quickly as possible.

4.1.2. Stakeholders, users and their needs

Several stakeholders impacted how the initial Ericsson indoor tool was used. A particular challenge of this project was to identify users and their needs. The reason is that Ericsson organizational structure is very complex. Below is a simplified mapping of the stakeholders (figure 4). Further, the needs of the users are described.



Figure 4: Simplified mapping of the stakeholders

Strategic management at the headquarters defines general sales strategies and guidelines that are communicated to the execution management in the regions. There are ten regions and each of them adjusts the strategies according to its market. The adjusted strategies are then conveyed to the sales teams from the countries that are part of a specific region. The sales support department (TSS) at Headquarters occasionally receives support queries from the sales teams and come up with solutions to solve them. The objective of the sales teams is to quickly propose solutions that are competitive from both technical and economical (cost) perspectives. In the particular case of the indoor area, this means selecting the right indoor products and equipment deployment configuration.

The primary need of the sales teams is to be able to approximate the total costs of such deployments and predict performance based on the chosen configuration (figure 5). To facilitate this process, they use the indoor simulation software tool.

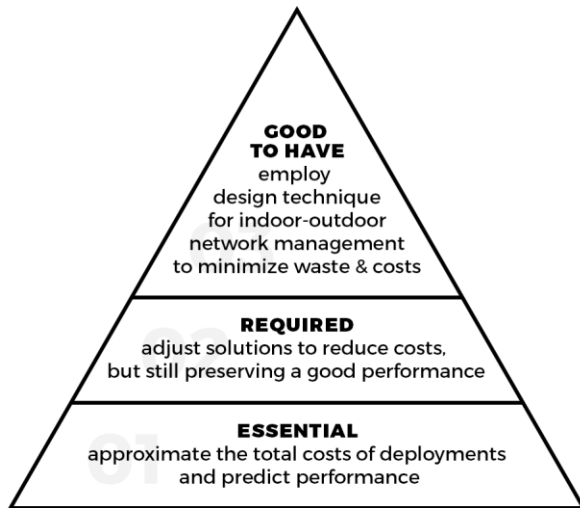


Figure 5: Hierarchy of sales needs of the sales teams

To stay competitive on the market, the secondary need of the sales teams is to make cost-efficient adjustments to solutions to reduce the costs, while still preserving a good performance. This would help the team gain competitive advantage and thus, close more deals with the customers. However, this requires the sales teams to obtain detailed data about the building where improvements have to be made and data from the network of the operator. The data can be

acquired from the operators. The operators, on the other hand, are not always enthusiastic about sharing their network data, because it exposes their pain points. Additionally, it is costly to obtain specific building data, before a deal is closed. Therefore, fulfilling this need is challenging.

A third need is to even further reduce the costs by employing an Ericsson design technique for indoor-outdoor network management, which minimizes the amount of network resources to deploy a solution. However, this requires a good understanding of the business case as well as the environment of the building.

4.1.3. The indoor simulation tool

The software is a simulation-based tool that renders radio propagation models inside a building, given basic building and network parameters. The original indoor simulation tool was a rudimentary GUI built as an add-on on top of the simulation engine typically used by R&D department. It can be used to evaluate and compare the performance of various products, configurations, and deployment options. A distinct challenge of the tool is that it requires processing resources for simulations, such as disk memory and time. Achieving a good optimization depends not only on the several configuration iterations of the technical parameters, but also on the understanding of the customers and business needs, along with acquiring the necessary data. As such, a tradeoff between time, simulation accuracy and cost estimations has to be made. A broader description of the simulation material is provided in my colleague's thesis (Laure, 2016). However, to be noted that the technicalities mentioned above create discomfort for the users. The problem arises as a consequence of the negative quantitative (increased number of support requests) and qualitative (frustrations) feedback incoming from the sales teams from different regions. The indoor simulation tool didn't satisfy their essential sales need (figure 5), which is to quickly approximate the total costs and predict performance.

The indoor simulation tool sought its applicability in the pre-sale phase of the sales teams where parties involved, discuss pros and cons of different approaches and solutions. Given the potential of the indoor simulation tool, the customers often ask for a more detailed level of approximations, rather than a general showcase. To support these requests, the tool continuously evolved, reaching a high level of complexity. The evolution of the functionality generated an interface rather difficult to understand and use. To get the best results possible, users from sales teams need to know the underlying problem of the customer's case. This can be achieved only through meticulous training or through experience. Given the relative new indoor products area, most of the sales team lack the experience required to get their jobs done, which makes it difficult for them to use the indoor simulation tool.

4.1.4. The Five-step model

At the same time our research team was exploring the organization and its environment, a new step-by-step model

(Five-step model – figure 6) for conducting sales was proposed at TSS.

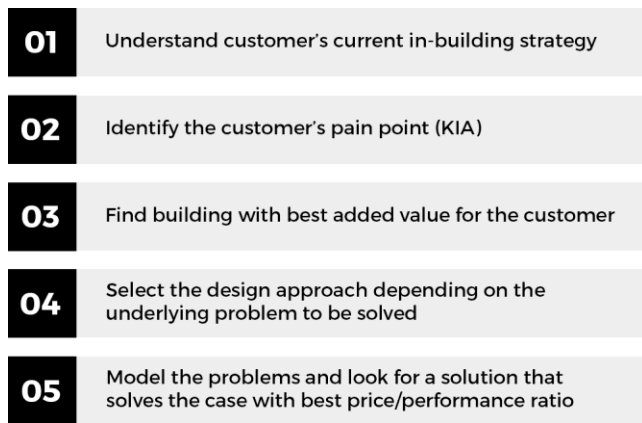


Figure 6: The Five-step model process for indoor sales

The model emerged as a necessity to help the sales teams better understand the customer pain points and strategy. It extends beyond the scope of the original tool, which was focused on a selected building. It provides support also for other strategic decisions, such as selecting the target buildings, to ensure that the customer (operators) will get a good business case for its indoor investments. The argument behind the process was that the structured process would eventually increase the agility of sales teams to come up with an estimate in regards to customer's demand and at the same time reduce the number of iterations required to achieve a good price/performance ratio. The model is a theoretical concept that combines several region practices. Its applicability in the field was not tested. However, the process received attention at the HQ. It was easy to explain and follow; therefore, the research team considered it a starting point for learning about the users and their sales practices.

4.2. The Lean UX process applied

One of the main pillars of Lean UX is to create outcomes (results expected from users) opposite to outputs (deliverables). The process described further on is rather an interpretation of the research team findings. Our goal was not to simply create a new polished interface for the tool, but rather to produce a change, which is to provide the sales team with a solution that would address their sales needs. Given the enterprise context described above, the process of applying Lean UX is presented next. This section provides a description of how Lean UX was adapted for each of the steps (figure 7).

4.2.1. Step 1: Declare assumptions

On the first meeting, the research team was set to apply the theory to Ericsson's case. The first step in the iterative process is to declare the assumptions, which are high-level declarations of what the team believes to be true. It is a group exercise, so I made sure all the team was present, including the domain expert. This practice helped bring all the team members on the same page and set the vision for the work.



Figure 7: Lean UX steps. Source: Gothelf (2013)

The meeting started with a problem statement. The team members brought arguments that were discussed from different perspectives. Once the team reached a consensus, the problem statement was formulated. Following the given template by Gothelf (2013):

[Our service/product] was designed to achieve [these goals]. We have observed that the product/service isn't meeting [these goals], which is causing [this adverse effect] to our business. How might we improve [service/product] so that our customers are more successful based on [these measurable criteria]?

We set the following as being the project's core problem:

" The TSS indoor tool was designed to help people in the region to promote and sell products. We have observed that the service is not meeting the support expectation from the regions which is causing sales go slow (not as good as expected) and creates confusion and stress amongst employees both, in the regions and HQ. How might we improve the support (guidelines and tools) so that regions can handle more questions by themselves and at the same time have fewer projects that need to be escalated to HQ? "

The problem statement was filled with assumptions and to dissect them we used the business and users' assumptions worksheet template provided by Gothelf (2013) (Appendix A). Some of the questions did not apply to the project simply because they did not make sense in the enterprise context. Examples of these are: *Where does our product fit in his work or life? I will make money by...; My primary competition in the market will be...; We will beat them due to...*

Up until this point, we used the organization's documentation mode by filling in the work into the PowerPoint slides. However, the team soon realized that something visible is needed all the time, so that we could go back and forth easily. The switch to post-it-notes was warmly welcomed by the team, since everyone could express their opinions and then talk about them one after the other. Framing ideas on a small piece of paper in a limited amount of time and space estate set the authors to phrase and organize their thoughts in a structured way. When we were discussing about them it was easy to read and immediately understand what that was about. We divided the board into "user assumptions" and "business assumptions" (figure 8).

We stacked them correspondingly. If some of stickers/ideas were repeating, we grouped them together.

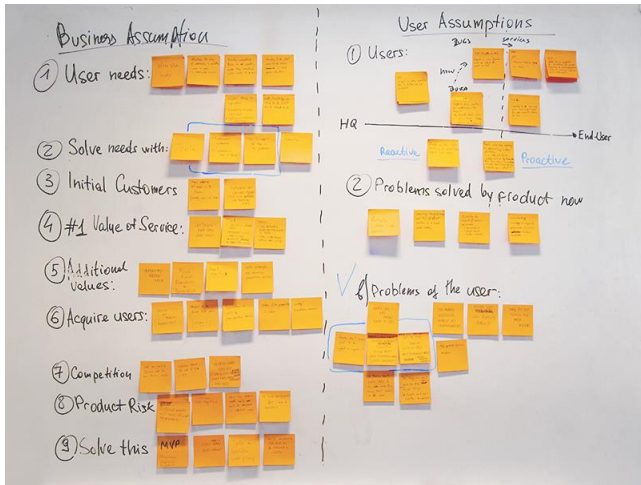


Figure 8: Assumptions

By having an overview of the project in front of us, we could easily scan and identify project risks. We classified assumptions according to the Prioritization matrix template provided by Gothelf (2013) (figure 9) on another board.

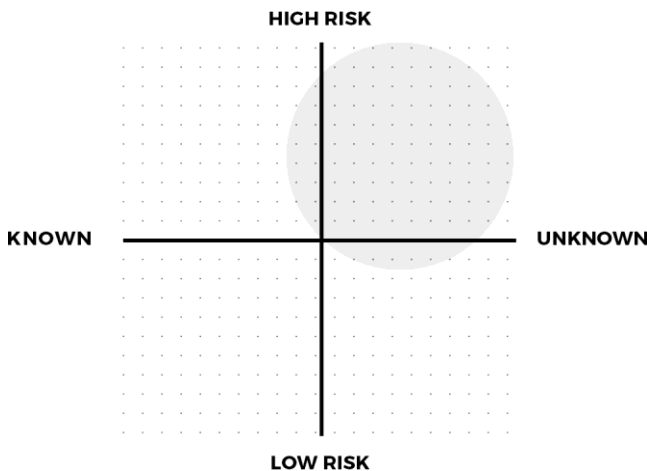


Figure 9: Template for the prioritization matrix

The assumptions that involved a higher degree of obscurity and risk were given a higher priority. These assumptions are marked with grey and are located in the top right corner in the prioritization graph (figure 9). Figure 10 illustrates the mapping of prioritized assumptions (figure 8) according to the prioritization matrix graph (figure 9). The team decided there are three assumptions that have a higher degree of priority. These are located in the top right corner (figure 10). The assumption declaration and prioritization part took the entire two-hour slot booked with the domain expert. During this time, the research team managed to touch several aspects of the problem, including the type of users. Given that the expert was not 100% of the time dedicated to the project, the rest of the work was conducted with the remaining team. The

insights gathered helped the team finish the exercise for step 1 of the Lean UX process.

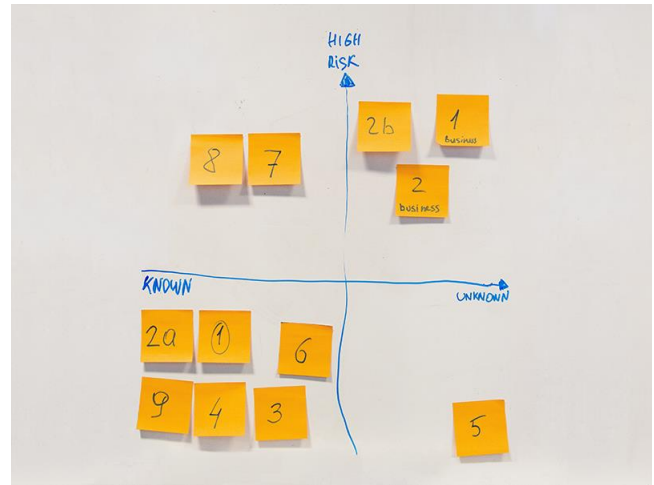


Figure 10: Prioritization matrix applied to the case

Gothelf (2013) suggests describing users as proto-personas, which are our best guesses to who is using the product today and who are the stakeholders that have an impact on it. The research team assumed there are two categories of users according to the way they act: Proactive and Reactive (figure 11). The current users of the indoor simulation tool are users marked with number four in the figure 11. The roles of the other type of users illustrated in the figure 11 are described in my colleague's thesis (Kortbeek, 2016).


ERICSSON 	REACTIVE	PROACTIVE
SALES TEAMS	4 Engagement practitioner Solution architect	3 Key account manager / Technology manager
REGIONS	5 Bid office / BUGS	2 Engagement driver
HQ	6 TSS	1 Product / Marketing Manager

Figure 11: Stakeholders classification

A key aspect of the step 1 in the Lean UX process is to define outcomes, which are the signals to seek from the market to help us validate or invalidate hypotheses. Whilst we did not manage to talk about it specifically, such signals were mentioned briefly during assumptions discussion.

Ideation in Lean UX is represented by suggestions of features that would solve the problems of the users. Usually, this is the part most projects start with and where the most debates occur (Gothelf, 2013). However, we kept them for the end to prevent the discussion being shaped around features, but rather use to assemble hypothesis. Given that the intended process (Five-step model – figure 6) had five steps, we set each step as being a particular feature to be tested for the tool. However, we assumed there are additional sub features for step number three.

Given the problem, assumptions, outcomes, proto-personas and features, the next step is to assemble the hypothesis using the following template:

We believe [this statement is true]. We will know we are [right/wrong] when we see the following feedback from the market: [qualitative feedback] and/or [quantitative feedback] and/or [key performance indicator change].

These are more specific descriptions of the assumptions that target defining the workflow for experimentation. Since we were lagging behind, we set to test three hypotheses at once. The hypotheses were the following:

H₁: We believe that the five-step model (figure 6) will help the sales team have a better understanding of the customer. We will know we are right, when interviewees describe similar patterns to the model proposed.

H₂: We believe that during the sales process the sale teams need to prioritize amongst a list of buildings. We will know we are right, when interviewees recall situation(s) from the past when they had to do it manually.

H₃: We believe that there are two types of users (figure 11) classified according to the way they act. We will know we are right, when some of them indirectly describe themselves as being proactive, whilst the others are reactive.

With the above hypotheses, we were trying to learn the following:

1. Find out about the existing process of the sales teams and whether the new conceptual five-step model would provide any value to them;
2. If there are currently cases where the “building prioritization” feature would help them;
3. If one tool can satisfy the needs of both types of users (Proactive and Reactive).

To validate the hypotheses, we were looking for the following signals:

1. Positive feedback about the process;
2. At least two examples from all the interviews were they had to prioritize amongst a list of buildings;
3. Some of them sharing reactive experiences in which they typically respond to customers’ requests; whilst the others being proactive and creating sales opportunities.

4.2.2. Step 2: Create a MVP

A Minimum Viable Product is the smallest artefact that helps the research team to test assumptions and to validate hypotheses. A MVP should include only as much time, effort, and fidelity as are needed to generate useful feedback (Brown, 2008). Gothelf (2013) differentiates between two types of MVP. The first type is temporary and is meant to learn something from the users. The second type is a feature or a small version of the product, which delivers value as

quick as possible. Similar to the first type of MVP, the second provides the team insights on what should be considered next. For the first iteration we went with the first type of MVP, in order to learn about the need of the solution and if there was value into what we were about to develop.

To test hypothesis H₁, we used PowerPoint slides in which the five-step model was explained. For the second hypothesis H₂ we sketched on paper a sequence of screens for the “building prioritization” step that we assumed was required as part of the five-step model (figure 12). And for the last hypothesis H₃ we prepared a set of explorative open questions in order to know more about the users.

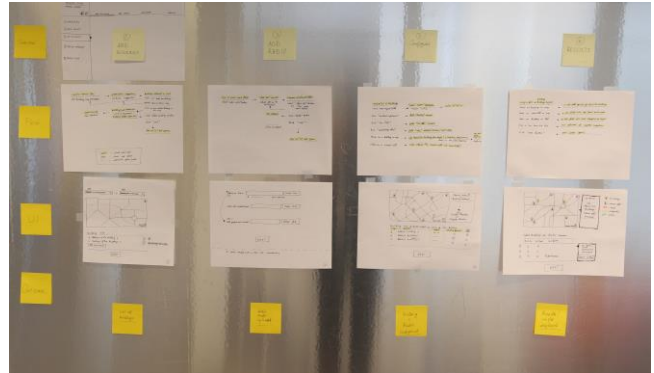


Figure 12: MVP for the “building prioritization” hypothesis

Along with these MVPs, we created an interview outline and a set of semi-structured questions, in order to guide the interviewer running the experiment.

4.2.3. Step 3: Run an experiment

Once we were set with MVPs we had to identify users with whom to confirm our hypotheses. This step was challenging, since we could not have direct access to a user base. With the help of a manager (see number 1 in the figure 11), the team managed to send several emails and receive replies from users marked two and four (figure 11), which were interested in the experiment. We arranged seven online interviews with users from 6 out of 10 Ericsson regions. The interviews lasted between 30 to 60 minutes, and were conducted during three days. The participants were informed about the scope of the interview and that the data collected will help the research team take grounded decision regarding the design of the software tool. Additionally, the participants were guaranteed confidentiality. The interviews were modeled to find out current sales practices and then trigger discussion around them by presenting the new sales-model. Sketches were used along with the slides to talk not only about the process, but also about the interface for the tool (figure 13). For each interview, two research members were participating; one was leading the conversation, whilst the other was taking notes. At the same time, the interviews were recorded to reference back if needed. We did not transcribe all of the interviews, but rather used the notes to communicate similarities.

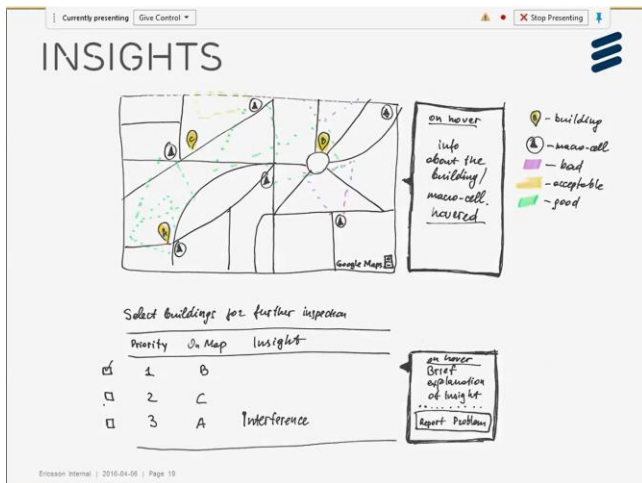


Figure 13: Screenshot from one online interview

4.2.4. Step 4: Feedback and results

The interviews provided valuable feedback for the research team. Whilst the research team did not set exact metrics in place to evaluate whether any of the three hypothesis is confirmed or not, the notes taken during the interview suggested the confirmation of all three hypotheses.

In regards to hypothesis H_1 (The five-step model as a sales process concept), all of the participants agreed that the model was relevant and would be warmly welcomed if implemented. However, two out of seven users were confused about step number 1 and 2 of the five-step model. The reason is that their market was advanced and, therefore, these steps were not relevant. Another two users suggested that step number 1 and 2 should be merged, since they both answer the same questions. As a result, the research team understood the different existing sales processes of sales teams and the extent to which the Five-step model for conducting sales could help them.

Hypothesis H_2 (Prioritizing a list of buildings) made sense in some cases where usually the sales teams would start a new collaboration with the customer. One of the interviewees said that customers give some general requirements for which kind of building they are looking for: “Operators typically ask for buildings with these characteristics, maybe 2-3 floors, 1000 m², with this kind of traffic...” and then they start discussing about what could be the best potential candidate that fulfil both parties’ requirements. They could choose to show the benefits in one building (one that has the most critical issues). Nevertheless, this is not always the case; therefore, the step is specific only for a limited number of cases.

In regards to hypothesis H_3 , a pattern was spotted, which corresponds to the initial classification of users. However, we found out that the classification of users depends not only on their type of activity (engagement driver vs practitioner), but also on the market of the regions. This is because some customers expect the Ericsson team to lead, whilst in other markets the operators control the whole process: “The

customers are doing it themselves. They have a process, quite a lot of people to do this activities... planning process, finding buildings, building requirements... all sorts of tools”.

The first iteration helped the team validate hypotheses. The feedback gathered led to learnings and insights about the proposed Five-step model (figure 6).

4.3. Outcomes

The Lean UX process helped the research team structure and test assumptions about the new proposed Five-step model (figure 6). From the first iteration, the research team learned that this model suits better some regions than others. Additionally, the team learnt more about personas.

Another observation is that the Five-step model is something that would work for new engagement with the customers. From the interviews, it can be inferred that these kind of engagements are typically taking place in new emerging markets such as India or South America. On the other hand, saturated markets such as those from Europe or East Asia already have in place old indoor systems and, therefore, the new products are typically acquired to solve smaller pain points. It was also communicated by several interviews that the operators have capabilities and they know what they need to solve their problems. On the other hand, emerging markets lack these capabilities. They often expect the companies to come up with solutions and display the benefits. Therefore, having in place a sale process, such as the one proposed, the sales team will provide valuable insights for their customers.

Another finding was that the Proactive type of users are the right user target for the Five-process model. Practitioners are involved later on the stages of this model when the business has been set up. However, they have to be aware of the decisions taking so that they can come up with the corresponding technical solution to fit the business cases.

5. DISCUSSION

This study tested the applicability of the Lean UX process in an enterprise context. The thesis presents an example of adaptation for the internal development of simulation-based software tool. Due to the large scope and the short time available for this project, no functional deliverables have been presented in the end. However, the study provides a set of valuable learnings and insights for Ericsson as an input for future work on the indoor simulation-based tool. A set of conclusions are further described.

5.1. Lean UX in enterprise

5.1.1. Users

Gothelf (2013) presents Lean UX with examples applied in a Business-to-Consumer (B2C) context. Hypotheses are tested there with external users. However, designing software tools for internal employees is different. Compared to consumer markets, the number of employees in an enterprise is limited. Users are physically located all over the world and getting in contact with them requires help from the upper management. Since the organization is so big,

identifying users and discovering their personas takes a big part of the research time. In this case, using proto-personas (best guess of potential users) is a useful and efficient technique to make the team aware of them and frame assumptions around them instead of discovering the users first. Lastly, most of our users were busy. Even though most of them were happy about participation and showed further interest: “*Is there an opportunity for me to come back to you with more suggestions?*”, it was rather difficult in the beginning to set up online meetings with them. This is typically because of the overloaded agendas, but also because of the low significance associated with such kind of activities. Therefore, acquiring users within enterprise is hard.

Another observation deduced from this case study is that UX design for internal enterprise software tools is far more challenging than for consumer-oriented ones. The reason is that designing consumer software is driven by the goal of end-users’ satisfaction, which in return generates sales. However, in enterprise environment, there are several user groups with different goals. Each of them would like to get their tasks done as easy as possible. Not only, the research team has to empathize and understand the needs of each of those, but also it is important to prioritize them. Otherwise, the tool has the risk of congestion with several trivial features.

5.1.2. Engineering domain and documentation

Given the advanced engineering level of the case, the interpretation of collected data has to be analyzed with the subject expert. Since the expert had many other assignments and could not be dedicated 100% of the time to this project, findings had to be documented. Given that the enterprises are big entities, outcomes of such design processes are not visible. This occurs at the beginning of the project, when the team maximizes the learnings. Documenting every single learning would create waste and would not add any value for the end-user. This also slows down the team by shifting the focus from faster informal learnings to slower formal experiments. However, documentation is important in enterprise context to communicate progress to the management. One way to keep documentation light is by displaying MVPs in visible common areas. Even though this would be temporary, the change in MVPs displayed would reflect the progress of the team. However, once MVPs become digital and changes will occur at a micro-level, externalizing them becomes trickier. Externalizing the work informs other departments and leaves space for feedback and suggestions. This also helps to evangelize UX in the organization.

5.1.3. Outcomes vs Output

Another challenge for the process in enterprise environment is that deliverables are expected in the end. Whilst Lean UX is intended to provide value to users, it should rather be perceived as a learning process that needs to occur before anything can be produced. Liikkanen et al., (2014) mention

that by following a Lean approach, an organization should emphasize a team’s autonomy in taking decisions not only in development, but also in design and business-related processes. Decisions should be taken based on the learnings gathered from experiments. Liikkanen et al., (2014) claim that this is a major problem for any big organization that typically involves more stakeholders. Therefore, the management and the stakeholders involved have to define expected outcomes (from the users of the tool), instead of demanding deliverables. They also have to understand that exploration is part of the learning process and that testing hypotheses are meant to reduce uncertainties. Invalidated hypotheses at this stage have to be considered beneficial since minimal resources have been invested to get feedback.

5.1.4. Case learnings

The introduction of the Lean UX process at TSS has taken longer time than anticipated. Therefore, the impact of the Lean UX for the TSS department is still minimal. The process applied has not provided any tangible benefits to the sales teams in the regions. However, the research team acquired the necessary learnings to proceed to the development of the software tool. The results of this study recommends a step-by-step approach to development of the Five-step sales model. Given the complexity of the Ericsson environment and advanced engineering domain, minimal value should be provided to one region at a time, opposed to designing for everyone. Even though there are similarities, dedicated solutions for each region or cluster of regions have to be created. The management has to rely on the research team’s findings and make decisions on which region or cluster has to be prioritized first. Feedback from one region could provide insights for the next iteration and speed up the development process of the software tool for other regions.

Following a narrow approach will result in immediate visible outcomes. However, achieving a functional MVP is rather difficult with a simulation-based tool. This is because prototyping with simulation material involves a lot of efforts, which is against the scope of a MVP. For this purposes, MVPs seeking learning (rather than MVPs providing immediate value) should be employed first. Even though the concept might be abstract, MVPs present visual aid for discussions with users. This is especially useful in the context of remote interviews. Prototypes are a good starting point for interviewees to open up. Encouraging them to reflect on the proposed MVP by referring to a recent case of theirs, would provide insights on how it might support their type of activity. Several similar examples might pinpoint major pain points to be addressed.

5.2. Corporate UX maturity

The research team was tasked initially to redesign the interface in order to solve the complexity of the Ericsson indoor simulation software tool. This can be achieved through designing for good UX. However, the value of UX is yet to be understood by the part of the organization the research has been conducted for. Applying a user-driven

process to innovation such as Lean UX in an environment where UX is vaguely perceived is very challenging. Advocates for UX not only have to explain the benefits of it, but also have to make workarounds the rigid organizational structure and legacy.

The lack of resources and the low attention given to UX research activities corresponds with the description of the second and third stage of Nielsen's UX maturity model (2006). According to this model, the TSS department environment is still at stage number two: *Developer-Centered User Experience*. The contribution of the research team managed to create awareness and raise it up to stage three: *Skunkworks User Experience*. Nielsen (2006) describes stage three as following:

"There's no official recognition of user experience as a discipline, nor is there an approved budget allocated in advance. All UX activities and user research are ad hoc and driven by user advocates who want a bit more data to improve the quality of the one thing they're working on at the moment".

The description corresponds to the situation as of the time this research has been conducted. Whilst there is a desire to improve the quality of UX, it is very basic. The organization expected the research team to rely on its own intuition and expertise to redesign the indoor simulation tool. Given the engineering domain of the company, the design team alone could not redesign the tool without a clear understanding of the users, their needs and the sales workflow.

The UX maturity level affects how the Lean UX process is applied in an enterprise context and what benefits it brings for the organization. The Lean UX process can be applied in cases where at least one dedicated multidisciplinary team is working full-time on a project given the necessary resources and expertise. This typically happens at stage number four of Corporate UX maturity model. Nielsen (2006) claims that progressing from one stage to another takes up to seven ages. The size of the company affects how fast this transition occurs. As long as the organization is not aware of the Lean method of working and does not prioritize UCD as something vital for an innovation project, advocates of Lean UX process will struggle to provide value. Researchers can understand how to adapt the Lean UX before committing to the process by analyzing the UX maturity stage of the organization it is applied, according to Nielsen's (2006) maturity model.

5.3. Method limitations

One limitation of the study is the selection of the case, which is challenging due to its advanced engineering nature. Since the research team was not familiar with the enterprise environment and its challenges, a lot of time was spent to comprehend the case before conducting any studies. A simpler case study would have been more appropriate to test Lean UX in enterprise context. On the other hand, the

challenges and uncertainties encountered in this case study is what makes lean principles be relevant for the design of UX.

5.4. Further work

Future research has to be conducted to establish if there is a correlation between the stage of Corporate UX maturity and the value of Lean UX in an enterprise environment. A potential hypothesis might be that the lower the UX maturity stage an organization is - the less practicable Lean UX process becomes in an enterprise environment.

6. CONCLUSION

This study applied the Lean UX process developed by Gothelf (2013). The process was adapted to fit the specific study case of an Ericsson's internal simulation-based software tool. The results of the study demonstrate that the Lean UX process can be adapted for an enterprise context, but the organizational context affects the way it is applied.

One particular challenge is the advanced engineering level of the case, which makes it hard to come up with functional MVPs from the initial iterations. Therefore, MVPs that focus on learnings should be employed first.

The second challenge is internal enterprise users and their different goals. Compared to consumer markets, the number of employees in an enterprise is smaller. However, similar to consumer markets, sales teams' markets are different. These differences in markets create different use cases, flows and types of users that suggest that validation of experiments should be more focused, seeking small validation of hypotheses, rather than trying to find an universal solution. Serving small group of users at a time would improve the UX.

A third challenge is the company's limited understanding of UX. As described by Nielsen (2006), companies typically progress through a series of stages, ranging from "hostility toward usability" to "user-driven corporations". The stage at which the company is, affects how Lean UX is applied.

Whilst the process itself was only slightly adapted, the way the process is applied takes many efforts. The research team spent a lot of time with organizational and preparatory aspects for the Lean UX process to take place. This would not represent a problem if the organization understood the value of UX and facilitated this process.

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9. APPENDICES

9.1. Appendix A: Template for business and user assumptions

Business Assumptions Worksheet

I like to use this worksheet (created by my partner Giff Constable) to facilitate the assumptions discussion. There are many ways to complete this worksheet. You can answer the questions as a team, simply discussing each answer. Or you can run a structured brainstorm/affinity mapping exercise for each question. However you do it, remember that it's important to give everyone a chance to contribute. Also, don't worry if you get to the end of the worksheet without clear agreement on all of the answers. The goal is to collect statements that reflect what you and your team think might be true. If you have strong disagreement on a point, capture the different perspectives.

Assumptions Worksheet

Business Assumptions

1. I believe my customers have a need to _____.
2. These needs can be solved with _____.
3. My initial customers are (or will be) _____.
4. The #1 value a customer wants to get out of my service is _____.
5. The customer can also get these additional benefits _____.
6. I will acquire the majority of my customers through _____.
7. I will make money by _____.
8. My primary competition in the market will be _____.
9. We will beat them due to _____.
10. My biggest product risk is _____.
11. We will solve this through _____.
12. What other assumptions do we have that, if proven false, will cause our business/project to fail? _____.

User Assumptions

1. Who is the user?
2. Where does our product fit in his work or life?
3. What problems does our product solve?
4. When and how is our product used?
5. What features are important?
6. How should our product look and behave?

You may discover that some of these questions don't apply to your project. That's okay—you can adapt the questions to your situation as you see fit. If it's early in the life of your product, you'll probably spend more time on the business assumptions. If you've got a mature product, you'll probably focus your energies on the user assumptions. The point is to cast a broad net and look for assumptions in all dimensions of your project.

When you've completed the worksheet, you will have a list of assumption statements. Your next step is to prioritize these assumptions.

Source: Gothelf (2013) p.21

