Early Product Design in Startups: Elements of Minimum Viable User eXperience

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Abstract. Startups often begin with minimal product versions to test and validate their product ideas. However, it is often challenging for startups to gather reliable early feedback as users easily focus on disturbing issues in the design instead of evaluating the product idea itself. In this paper, we introduce a concept of Minimum Viable User eXperience (MVUX) to support the evaluation of early product ideas. The purpose of MVUX is to ensure that users can get a sense of the intended product value with a sufficient user experience (UX). To understand the elements MVUX consists of, we conducted an interview study with 13 participants from eight startups in Finland investigating the elements that startup entrepreneurs consider focal in their early product versions. As a key finding, we propose a structured set of UX elements that enable the success of selling the product idea to the end-users.

1 Introduction

Startups are known for their small resources and highly innovative products. The possibility to create software products for global markets seems to be open to everyone who has ideas and perseverance. While technology offers a plethora of sophisticated tools for creating these products and services, customers and users can be demanding. Being able to deliver good user experience (UX) from the earliest product version can enable positive word of mouth advertisement [Fuller et al.] and keep interested people as users for a longer time period.

One competitive advantage with startups compared to large organizations is their ability to move fast and adapt to changing circumstances [16]. In contrast, having short time to market can be more vital for startups compared to large organizations since startups without paying customers lack resources to fine tune complex products before the launch [16]. Moreover, as founding teams of startups often consist of only a few individuals, the teams' skills are naturally also limited. For the same reason, the primary business objective of startups is to survive [3]. Therefore, to survive, startups need to make the most out of their limited resources.

Customer development model [1] as well as Lean startup method [14] suggest close co-operation with potential customers while experimenting fast. Such practices aim at ensuring that the resulting product is profitable instead of building a product

first and then trying to sell it. Experimenting with a Minimum Viable Product (MVP), a product versions as minimal as reasonable, enables a startup to find validation for their product idea as well as finding the right way to implement the idea [14]. Processes and ways of working need to be adapted to the startup context that is characterized by scarce resources, time pressure and uncertainty [13]. Regarding the user experience (UX) design, the traditional major upfront user research and design that aims at a complete product design is not suited to the needs of startups. Due to the scarce resources, startups need to do "just enough" to test their idea without creating waste in the process. Based on an experiment with end-users, a startup might change the product drastically. This means the targeted user group can also change and make the conducted user research and other upfront work futile.

While startups should minimize the time invested in the design work for early product versions, the UX design of the product still needs to have an adequate quality level to enable testing of the product idea [8]. Insufficient or disturbing UX might reduce the user feedback, and make the users concentrate mainly on the appearance of the user interface. At the worst, it can lead the user only to criticize the UX even if the product idea itself was good. [8]

The goal of the present work is to understand which UX elements are essential when building early product versions in small software startups. We based the study on the assumption that MVUX is realized when 1) user can perform the core use cases to gain value, 2) basic hygiene factors for usability and appearance are in place, and 3) the startup gets enough of feedback and data to validate and further develop the product idea. In this paper, we report results of an interview study we conducted in eight startups in Finland. All the startups were building, or had recently built, first versions of their products. Through the interviews we wanted to answer the following research questions: (1) how startups start the product development of their early product version, (2) what are the goals and key elements of MVUX from the startups' perspective and (3) what skills and resources help startups to achieve the MVUX for the first publicly launched products.

The rest of this paper is structured as follows. Section 2 presents related work considering startups, their development styles, and UX practices. In Section 3 we describe our study context and methods. Section 4 presents results including characteristics of early product versions and identified elements of MVUX. Section 5 gives discussion over the results and Section 6 presents the final remarks for the paper.

2   Related Work

This section presents the related work addressing the ways of working in startups. We discuss the characteristics of startups and their approaches to software development. In addition, we introduce the concept of UX and practices related to it in software development activities.

2.1 Ways of Working in Startups

Software startups are characterized by both engineering and business concerns to a more extensive degree than established companies [16]. Those concerns include being young and immature, having scarce resources, operating with novel technologies in dynamic markets, and being influenced by divergent stakeholders such as investors, customers, partners, and competitors [16]. Also customer-focused approach seems to be more crucial for small companies [15]. Customer's happiness literally means more work and increased business opportunities for the company as the happy customer wants more and is willing to recommend the software to others [15]. Because of unestablished customer base, such positive word of mouth and keeping the existing customers satisfied is essential for startups.

The professionalism of the entrepreneurs themselves often acts as a primary information source for startups due to unestablished stakeholder networks and customer base [3]. Moreover, people factors tend to be even more crucial for startups than for larger companies in the success or failure of the software [16]. Thus, the entrepreneur team is in a key role in keeping the startup focused and moving ahead [16].

Due to the scarce resources, startups tend to concentrate on the actual development work without following defined software processes [3], [16]. For startups, short time to market is one of the most critical process goals [16]. Since a fundamental goal of a process is to describe the way an organization develops its software in a predictable and repeatable fashion, benefits of an established process do not meet essential needs of software startups [3], [16]. Therefore, startups require more informal and lightweight approaches.

When entrepreneurs are familiar with certain software processes, they tend to adopt practices from those processes rather than experimenting with new approaches [3]. They scale down known process models by dropping certain practices based on their needs, expertise, background of the development manager, and the market requirements [3]. In addition, they adopt new practices reflecting the context they are operating in [3]. They tend to continue the process tailoring–or improvement–throughout the lifecycle [3].

2.2 Methods for Startups

Customer development [1] and a continuation of it, Lean startup method [14] have been gaining attention as new entrepreneurial practices. These practices emphasize that startups should concentrate on producing customer value and avoid wasteful activities. Academic research on how well Customer development and the Lean startup method work is scarce but they have been widely adopted by incubators, accelerators and university entrepreneurship courses [19].

The Lean startup [14] suggests that by validating hypotheses of customer's problems startups find a problem/solution fit. After this the startup should validate what product would suite to the solution. Validation should be done by building

minimum viable products (MVP) and measuring the key performance indicators when "getting out of the building" with the MVPs. This means validating with real potential customers. From these experiments, startup should gain validated learning [14]. This Build-Measure-Learn (BML) cycle should be continued until a product/market fit is found. Startups should also be prepared to discard the MVPs if they do not measure up to validating sustainable business opportunity.[14]

2.3 User Experience Work

UX, defined as *"a person's perceptions and responses that result from the use or anticipated use of a product, system or service"* [9], has become an important competitive advantage in e-commerce [5]. UX is commonly divided into practical-oriented and hedonic dimensions [6]. The first dimension includes aspects related to easiness to use, productivity, and usability while the latter concentrates on users' emotions such as enjoyment and motivation. Regarding industrial UX development, companies in general tend to focus more on the practical qualities of UX neglecting the more hedonic ones [18].

Basically, UX development consists of activities related to gaining understanding of the user and the context of use, designing and developing for good UX, and evaluating the resulting outcome [9]. UX design has roots in human-centered design (HCD) [9]. HCD starts with thorough user research and design activities which are followed by design iterations. Major upfront work before starting to implement anything may not be feasible in software projects. For Agile software development [7] Agile-UX methods have been developed to be in line with agile iterations. For instance, Sy [17] has presented the most commonly cited *"one sprint ahead"* approach for Agile-UX development and Kuusinen et al. [11] describe UX work in mobile development context. Research on Agile-UX often recommends conducting design work iteration ahead of the development [17],[2].

Similarly to software processes, startups generally do not afford to follow rigorous methods for UX development. However, little is known about UX development in startups. May [12] describes lessons learned from applying lean methodology in a startup and recommends planning the UX activities in from early on. Klein [10] presents lean startups light weight methods for UX work. Finally, Hokkanen et al. [8] reports that lack of UX expertise hinders the startup from collecting useful feedback from users.

3 Research Context and Methods

To gain insights of practices and goals of startups' UX design for early product versions, we conducted a semi-structured interview study with eight startups. One to three entrepreneurs from each startup took part in the interview. Startups were searched by going through Finnish startup incubator and accelerator programs. Some startups were recruited through directly contacting them based on their web page. Other startups were recruited by advertising in the premises of one incubator program.

3.1 Participated Startups and Interviewees

All the startups we interviewed were small and were creating a software product. Table 1 presents characteristics of the eight participating startups and the interviewees. The startups are numbered from ST11 to ST18, to differentiate them from the startups in our previous study [8]. The size of the startups varied from one person to a team of six people.

Table 1. Summary of the participated startups and interviewees.

Startup	Interviewees	Company established	Size of startup	Product	Market
ST11	H01 (CEO)	2013	1	Online marketplace	B2B, B2C
ST12	H02 (CEO), H03	2014	6	Online marketplace	B2C
ST13	H04 (UXD)	2014	4	Online community and marketplace	B2B, B2C
ST14	H05, H06 (CEO)	2014	2	SaaS for pet owners	B2C
ST15	H07 (CEO), H08	2011	2	Automation software	B2B
ST16	H09 (CEO)	2014	5	Mobile sports application	B2B, B2C
ST17	H10, H11, H12	-	3	Mobile personal finances application	B2C
ST18	H13 (UXD)	2015	3	Mobile social application	B2C

All the startups were Finland-based and two of them (ST12, ST17) had an international team. Startup ST17 was not an officially established company at the time of interviews but it was in an incubator program and three people were working on the product development full time. Two of the startups (ST13, ST18) had a trained UX expert in their team. Four startups (ST11, ST12, ST14, ST16) had a person with some knowledge in UX design in their team. Two startups (ST15, ST17) currently had no UX related expertise in their team.

At the time of the interviews, six of the startups (ST11, ST12, ST13, ST16, ST17, ST18) were in the early phase of product development where they had no revenue. Product of startup ST14 was used by paying customers and ST15 had a pilot project with a paying customer. Revenue streams were not significant for either one of these startups. All the startups were looking for a sustainable business model. ST15 and ST16 had received funding from the governmental research and innovation agency at some point. ST15 had started the business opportunity search in a government agency funded project. ST16 had started with a year-long study period conducting market research and mapping the value creation of their product. After getting funding, ST16 hired a programmer and an industrial designer and started product development. Startups consisted only of the founders of the startup except for ST12 and ST16.

Products that the startups were developing varied with only one startup (ST15) focusing purely on B2B market with their automation software. Three of the startups (ST11, ST12, ST13) were creating marketplaces where businesses or individuals could sell their products or tickets to events to consumers in new ways. Three startups (ST16, ST17, ST18) were creating mobile applications for consumers. ST16 also had a B2B market in providing their application to use of businesses. ST14 was offering a web based application for consumers, targeting at pet owners.

All the startups except for ST15 were currently actively doing product development. ST14 had launched their first version over a year ago and was building the renewed version of their product as an open beta for which they were redesigning the UX. Other startups were in a more homogeneous stage. Startups ST13, ST16, ST17 and ST18 were preparing to release an early product version for users. Startups ST11, ST12 and ST14 were currently collecting user feedback of their early product versions. In the interviews ST15 was reflecting their work on the completed pilot project.

The thirteen interviewees presented in Table 1 were all working full time in their startup. The educational background varied but majority of the interviewees (H04, H05, H07, H08, H09, H10, H13) had a university degree in an ICT related subject. H04 and H13 had majored in Human-Computer Interaction. Two interviewees had UX-related background, one in visual arts (H01) and one in visual design (H06). H11 and H12 were finishing their studies in mechanical engineering at the moment of the interview. H02 had a bachelor's degree in international business. H03 had not continued studies after secondary school. H01 was female and rest of the interviewees were males.

3.2 Interview Study Method

To address our research goal of understanding which UX factors are essential when building early product versions in startups, semi-structured interviews were chosen as the data gathering method. The eight interviews were conducted by one researcher and they lasted between 50-90 minutes. Each interview session consisted of questions aiming to understand the current state of the startup after which their current goals and work practices were discussed. The focus of interviews was on UX related practices and motivations. However, activities such as product and business development were also covered on a high level to understand their effects on UX design. We introduced the general concept of MVUX to each interviewee. Participants were then asked to write on a paper their goals and central elements for UX of their earliest product version intended to be deployed to users. Differences in UX goals between the earliest and complete product version were also shortly discussed.

The interview data was analyzed from written transcripts of voice records. The analysis was done by iterative thematic coding. Main themes were first established based on interview questions. Sub-themes were then created from minor themes and findings from the data. For analysis of the MVUX elements, the terms that the interviewees used for describing the goals and central elements of UX of the early product version were collected. To find the main elements a bottom-up approach was

applied starting from the low-level elements the interviewees had mentioned. Together, 51 low-level elements were abstracted. These low level elements were divided into groups based on similarity to form mid level elements of MVUX. These elements were again divided into groups to find the main elements of MVUX. In the grouping of elements, also the context, not just the term, in which the element was discussed was taken into consideration.

4   Findings

We present the findings of our interview study. First we present the motivations and the starting point in the creation of early product versions. After that, the design practices for product development are described. The third subsection introduces the elements of MVUX and the goals associated with them. The last subsection summarizes the skills and resources that interviewees found useful for the UX work for early product versions.

4.1 Why Do Startups Build and Launch Early Product Versions

All interviewees described having started with an early product version that was minimal, restricted or very restricted on functionality compared to their vision of the product. Startups were familiar with the Lean startup concept of MVP but only ST16 used the term to describe the product version they were currently building. All the startups approached the product development in a lean way. This meant that startups for example searched validation before implementation by showing UI pictures to potential customers. They also implemented only the core functionalities to gain feedback instead of building the complete product they envisioned to have in the future. ST14 had built the product first for their own use only. ST15 developed a safety critical product that needed a certain level of quality to be usable and they had started with building a simulation of their product. Other startups did not have products with such critical aspects of safety or security, and were able to choose more freely what and how to implement into the early versions.

Startups were endeavoring towards achieving various goals with their early product versions. Startups ST13 and ST16 were preparing for a closed trial of their product with invited users. Startups ST11, ST12, ST17 and ST18 were building or currently had a version accessible to anyone. Early product versions were used to learn about users, target market and qualities of the product. Via early product versions startups expected to receive overall feedback (ST11, ST16, ST17), get better understanding of their potential customers or users (ST16, ST18), and see how users would use their product (ST18). Testing the technical viability of their product was considered very important by startup ST14 that was creating a new version mostly to improve UX and replace the underlying technology with a new one. H09 said that getting user feedback from the early product version would help in estimating how the amounts of remaining work. Other goals were to get a proof of interest in the product to convince potential partners or customers (ST15, ST16) or to start receiving revenue (ST14).

Despite all the startups had found people interested in their product, none of the companies had steady revenue streams. Proof of scalability of the business model was still unestablished. Startup ST17 was expecting that they need to change the product product – an app for mobile personal finances – significantly based on feedback before it would be successful. They described the early product version as building a good backbone to start learning more about use cases:

"As research shows, we have many use cases so, we can adapt to any of those if one of the heads will be cut. So it's like a hydra. [...] That's why we're building a backbone. A body. If one of the heads is cut, the body can live without the heads." H10

Interviewee H04 from ST13, which had abandoned their first product they had brought to market, said that preparing to major changes during the early phase was not sensible since it requires additional work and time. In his opinion, learning was the most important aspect if the product idea fails.

4.2 Design Practices for Early Product Versions

Decision making and process. The question of what to include and what to exclude when building an early product version is crucial. H01 described having to choose what could be implemented for the early product version based on their own skills. This included the creation graphic design and the programming. In the products of ST11, ST12 and ST13, one of the key qualities was the content created by businesses and individuals offering something for sale in the marketplace. The priority for startups was to communicate through the early product version how merchandise would be presented and made to look good. The role of the purchaser was considered less important at this point. ST12 had made a list of all the features they would like to have in the product. Priorities where decided with the whole startup team choosing *"the minimum ones so this service can work"* (H02). Implementation was then conducted by explaining the idea to a web designer who drew UI pictures and communicated them to a programmer. Also, in ST14, ST15, ST16, and ST17, the interviewees described using their own vision while deciding on the contents of the early product version. ST16 had approached the design decision by what they need to communicate with the product and then thinking of how to actualize it. H09 emphasized the importance of receiving feedback of the first impression a person forms of their product. In ST14 and ST17, the startup members iterated UI ideas by exchanging ideas and sketching them, after which one of the members implemented them as working software. ST14 put major importance on the visual aspect of their new versions. ST17 was mainly concerned about the functionality at the time of the interview and the plan was to make the software more visually attractive later.

"It's not the main issue right now, how it looks." H11

Interviewee H07 showed images of UI to their pilot customer to gain feedback on their UI design. ST18 had an idea of what their product would be in five years and H13 described the first early version to be the smallest possible core part of it:

"Well, this [product version] that we are building now is as simple as it can be. Basically you can't even do anything with it." H13

Practices for understanding the users. The product ST18 was developing was based on findings of H13's thesis. H13 had conducted a major user research as part of the thesis work and the startup utilized those results when starting the development and design work. H01 described having little or no contact with end users. She had had some discussions with acquaintances about her idea but she mainly trusted her own experiences on working with people who would be potential users. Although the team of ST17 had talked to friends, they had not gained much value for product development from these discussions. Face-to-face contact to potential customers and users to ask questions and show UI design was done in ST12, ST13, ST15 and ST16. ST12 had also eight test users that they contacted directly to ask what they thought about their changes in the early product version. ST14, that had had the first product version available for users for some years, had received feedback by asking their customers and web page visitors to answer surveys.

4.3 Goals and Elements of MVUX

During the interviews startups presented their goals and central elements for UX of early product versions. Table 2 presents the hierarchical categorization of low level elements under mid-level elements and the fashion they were further grouped to form the main elements of MVUX.

Intuitive (with six low level elements) was the most common goal. It was considered necessary to have a UI that was *simple* (5) and *easy to use* (5) to remove obstacles for the user to start using the product. In the case of ST15 in which the acceptance of end-users was important for convincing the pilot customer , H07 commented:

"The product had to be so easy to use that everyone would agree to start using it. That was the first requirement." H07

There was more diversity in how startups wanted the user to perceive the product: as *humane* (4), *visual* (5) or having a *feel of novelty* (3). *Hooking*, or *making the user to stay and want to come back* was mentioned three times as well. H06 from ST14 explained that their first version was developed to serve their own interests:

"We thought technical looking graphs would be cool and bring a sense of high-tech. [...] Then we realized normal people don't want to see that. You should have like soft high-tech. The high-tech Apple has, and not like laser beams." H06

Table 2. MVUX elements and their subgroups.

Main element	Mid-level element	Low-level element
Attractive	Visual (5)	Visual (ST14)
		Visual experience (ST16)
		Good visual appearance (ST11)
		Modern visual appearance (ST13)
		Not technical looking (ST14)
	Humane (5)	Likable enough (ST12)
		Storytelling (ST13)
		Personal (ST17)
		Easy to approach (ST14)
		Cozy and warm (ST14)
	Novel (3)	Fresh (ST12)
		Differentiation from regular services (ST13)
		Strong colours to differentiate (ST11)
	Hooking (3)	Gamification (ST18)
		Hooking (ST13, ST18)
Approachable	Intuitive (6)	Familiar UI elements (ST13)
		Familiarity (ST14)
		Intuitive (ST17)
		No learning curve (ST18)
		Understandable (ST18)
		Explicit (ST16)
	Easy (5)	Easy to browse products (ST13)
		Easy to use (ST12, ST15, ST16, ST18)
	Simple (5)	Simple (ST12, ST14, ST15)
		Simple design (ST11)
		Minimal design (ST11)
Professional	Credible (4)	Premium (ST17)
		Reliable (ST11)
		Secure (ST17)
		Credible (ST11)
	Functioning (3)	Functioning (ST15)
		Smooth (ST17)
		Device independence (ST14)
	Efficient (3)	Compact (ST14)
		Fast (ST17)
		See by glancing (ST14)
Selling the Idea	Introducing the idea (5)	First impression (ST17)
		Introducing the idea (ST11)
		Example pictures (ST11)
		Lobbing (ST15)
		Solution (ST12)
	Building brand & fan base (4)	Traction (ST12)
		Exciting (ST12)
		Social (ST17)
		Word of mouth (ST12)

Goals related to the product being *functioning* or *technically working* were mentioned three times. Depending on the product idea, communicating that the solution and application was *credible* (4) or *efficient* (3) was considered important.

Being able to introduce the product idea and show the value in it was one of the mid-level elements abstracted. Goals that aimed at creating brand and fans for their product had four low-level elements. Other than just introducing the idea, starting to create positive word of mouth influenced how the UX was designed. H02 said that he wants users think the product is exciting and tell their friends about it:

"That it's simple and something, that, you cannot do, almost anywhere else, so far." *H02*

Four groups that represent the main elements of MVUX were derived from the mid-level elements. The elements are *Attractive, Approachable, Professional* and *Selling the Idea*. Classification of attributes into these categories is demonstrated in Figure 1.
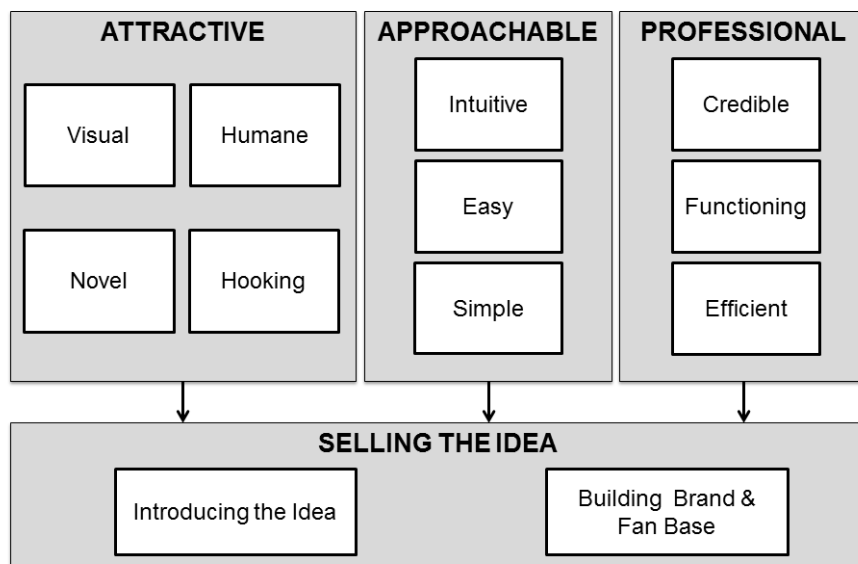
Figure 1. Elements of MVUX

At the bottom of the Figure 1 is Selling the Idea which is the main aim of MVUX since it gives the startup possibility to get feedback from users that understand their product idea. The three other elements create a foundation to enable user to be interest. The three elements can also be seen affecting the user in different phases of getting to know the product. The first impression of the product is influenced by making the early product version attractive. With Approachable elements, the usage is made easy. Giving a professional image of the product, and the startup, is the result of

a well-functioning, efficient product. When these elements are in place, the startup has good potential to sell the idea to the customer

4.4 Relevant Skills and Resources in UX Work in Startups

Role of UX for startups. Startups ST11 and ST12 that were currently collecting feedback to further develop their early product versions said that UX had an effect on collecting feedback. Overcoming bad UX meant having to clearly explain that the product is very much incomplete. In such cases these startups gained feedback mostly from personally asking feedback and comments from users. Startups ST13, ST17 and ST18 considered UX to be important when validating the product idea. Interviewee H09 described UX to be critical for their survival:

"We live and die with our UX, we have nothing else. [..] If we don't succeed with it, we won't succeed with our product." H09

Startup ST14 believed that UX would create competitive edge and they should put effort into it before making investments on marketing. Currently they were receiving calls from people who did not know how to use their product.

Skills and resources for UX work. Table 3 presents skills and practices that interviewees described to have helped them to design and implement the UX of their current or earlier product versions.

Table 3. Skills and practices that startups found useful in creating UX for first product versions

Skill or practice	Startups
Graphic design skills	ST11, ST12, ST13, ST15
Feedback collection	ST12, ST15, ST17
Producing minimal implementation that brings value to users	ST12, ST13, ST15, ST16
User testing	ST12, ST13, ST14
Usability theories or heuristics	ST12, ST13, ST14,
Recognizing good UI solutions from other products and mimicking them	ST13, ST14, ST17, ST18
Social skills	ST17
Iterative process	ST16

Finding the minimal implementation that would communicate the product idea and provide value to users was seen to be most important. This included choosing only what was necessary for the early product version.

Startups ST13 and ST18 said that they had had all the necessary skills and resources to do UX work so far since they both had UX experts in the founding teams. ST12 would have bought services to evaluate and improve UX if they had had money for it. ST14 estimated that having had skills to do user tests would have helped them. ST17 considered that their team was able to cope with UX related matters but was not prepared to analyze and use the feedback they would get in the future. ST11

mentioned that not having the technical skills to implement the ideas well caused problems in providing the wanted UX.

5   Research Validity

Since our study was qualitative, we assess our research quality in terms of credibility, transferability, dependability, and confirmability [4].

Credibility. We identified no major threats to credibility. Since the participants themselves wrote down the elements they considered essential for the UX of early versions, the study is less prone to interpretation error. Also, the MVUX model is in line with dimensions of UX as defined in [6]

Regarding the **transferability** of the results to other contexts, our study was conducted with eight small Finnish software startups. We consider that our descriptive findings are transferable to similar startups. However, as, for instance, the attitude towards the importance of time to market was much less critical in our sample than in [3], [16], it might indicate that some of the identified characteristics are specific to certain startups. Moreover, as startups – to a certain degree – reflect the entrepreneurs themselves; personal characteristics may reduce the transferability of the results. In contrast, regarding our main result, the MVUX model, we consider that it is more transferable to other contexts: It bases on the concept of MVP [14] and is in line with dimensions of UX [6]. However, the product type and the user must be considered when transferring the MVUX model to other contexts.

Threats to **dependability** include that the studied startups did not form a random sample, instead convenience sampling was utilized. However, we utilized open sampling method in which new participants are recruited after interviewing the previous one to increase variation in the sample. Despite concentrating on Finnish startups, our study increases richness of related research that has been conducted, for instance, in Ireland [3] and in Ecuador [15].

Finally, threats to **confirmability** include that a single researcher planned, conducted and analyzed the study. The researcher, however, reflected with other researchers in every phase of the study. The MVUX model was audited in a group of three researchers.

6   Discussion

As our study is based on interviews of 13 entrepreneurs from eight small software startups based in Finland, it naturally is limited to a narrow part of startups. Although the startups aim at competing on global markets, we consider that the rivalry amongst the Finnish startup genre is much smaller than to say, for instance, in the U.S. Comparing our results to previous studies on startups, one noticeable difference was in how the entrepreneurs regarded the time to market. In our sample, some of the startups had spent considerable calendar time conducting pre-studies at their own expense. Thus, it seems that the time pressure realized only after starting the

implementation of the product. Moreover, the urge to get to the markets was mostly for validating the first version with users rather than for getting fast revenue.

Our contribution is in explaining how startups approach UX work and which elements are essential for the early product version. Considering that the related research on startups in general and especially on UX work in startups is very limited, our study offers new insight both for the academia and for startups. In startups, the elements of MVUX could be used to guide the UX design of early product versions. Especially startups that do not have UX expertise would benefit from lightweight method to lead the design decisions. Further research should be done to understand and validate how MVUX could be used to support startups' UX strategy.

Startups begin with very different situations regarding the team, idea and resources. Ideas can be very personal or strictly born from recognizing business opportunities. The limited set of skills in the team that forms the startup leads the process of guiding the idea towards more concrete product and business plan. Startups ST12 and ST16 were the only ones that had recruited team members with a clear goal of gaining specific skillsets. Others were working with what the entrepreneurs themselves had.

Attitudes towards UX as part of the product were showing that good UX was considered important for the product's success. None of the interviewees said that the innovation and uniqueness of the product would make them succeed. How the startup was able to deliver the solution was what mattered. The process of getting from idea to a great product was perceived to require experimentation and feedback outside the company. Market researches gave some indication to startups that there would be a need for their product but they left a lot of room to choose how to answer to that need. Starting with only a limited product version based on some research and own hypotheses, and then iterating with real users and customers was the approach entrepreneurs had adopted. The level of thought put into strategies to collect and use feedback varied. From the interviewees H04 and H13 that had background in HCI were able to compare different approaches to gaining understanding of users and evaluating the UX. ST12 had put effort into understanding their real users and developed a strong network of test users that provided feedback when contacted personally. Lacking the experience in conducting surveys and interviews, they had also wasted time to collect data that was not useful to them.

The goals and key elements for UX of the early product versions had recurring themes from which we abstracted the elements of MVUX. Startups had different goals for what they wanted to achieve with their early product versions. Startups also had different amounts of acquired understanding of their target users as well as previous validation of the product idea. This provided a wide scale of goals and elements that reflected the different situations the startups were in.

The four main elements of MVUX that we found were Attractive, Approachable, Professional, and Selling the Idea. Comparing these to our assumptions in the beginning of the study we can see how they are connected. We assumed that to communicate the product idea and UX well enough the user should be able to perform the core use cases that answer to user's needs. Furthermore, we estimated the UX in these use cases should be at a satisfying level that does not disturb the user. These are in line with the elements Approachable and Professional that aim to provide trouble-free UX that shows the user that the product is trustworthy. Our third assumption for

MVUX was that it needs to enable startup to gain feedback and data for validation and further development. This would be achieved through elements of Selling the Idea and Attractive. The element Attractive has a role in getting users interested in the product as well as hooking them to keep using the product. Selling the Idea part needs to be in place to communicate the product idea clearly and to show how the product creates value to user. These enable continuous data collection from longer usage as well as users being able to give feedback on the product idea when there is no confusion on what the product is about. However, our initial assumptions did not put so much emphasis on the attractiveness, and good visual design of the product as the results of this study show.

These results serve to create understanding of how UX should be taken into consideration when startups create their early product versions that are used by real user. Our study consisted only of Finnish-based companies so companies' motivations and goals are influenced by the Finnish business and startup culture. Furthermore, the preferred design elements are influenced by the culture. More research is needed to validate how well the discovered elements suit to the needs of startups in general.

7   Conclusions

In this paper we introduced the results of our interview study of thirteen entrepreneurs from eight startups. We presented the concept of MVUX that represents satisfying UX of early product version that communicates the product idea to users. MVUX enables the startup to collect meaningful feedback and data to validate and further develop the product idea. We abstracted the elements of MVUX through a bottom-up analysis of startups' goals and key elements for UX of early product versions. The main elements were *Attractive, Approachable, Professional and Selling the Idea*. In addition, we reported the findings on why and how build early product versions and what are the skills and practices helping in creating UX for the early product versions.

Acknowledgement

8   References

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