# Focusing on User Experience and Business Models in Startups: Investigation of Two-dimensional Value Creation

Laura Hokkanen
Tampere University of Technology
Korkeakoulunkatu 1
33720 Tampere, Finland
+358 40 8440228
laura.hokkanen@tut.fi

Yueqiang Xu
University of Oulu
Pentti Kaiteran katu 1
90014 Oulu, Finland
+358 50 3411827
yueqiang.xu@oulu.fi

Kaisa Väänänen
Tampere University of Technology
Korkeakoulunkatu 1
33720 Tampere, Finland
+358 40 8490731
kaisa.vaananen@tut.fi

## ABSTRACT

While good user experience (UX) can be seen to provide competitive advantage for the company and added value to users, resources for achieving UX may often be lacking in software startups. Furthermore, in different phases of business and product development process, concentrating on the focal things can be challenging. In this study, we investigated the factors affecting UX work in startups as well as UX goals startups set for their products. Furthermore, we reviewed the goals in terms of the Minimum Viable UX framework as well as value creation aspects. We present qualitative results of a survey study with 20 software startups as well as findings of a literature review. Our study suggests that while startups aim to provide products with good usability, the lack of a more comprehensive approach to UX can hinder their value creation; affecting both user satisfaction and business success. As a result, this may affect the successful implementation of startup's business model.

## CCS Concepts

•**Human-centered computing~User centered design**

## Keywords

user experience; startup; value; business model; software

## 1. INTRODUCTION

Tremendous changes have taken place in software industry in the past decade. Companies - especially startups - are struggling with ever increasing global competition in software business. Such change drive software firms to shift the attention away from the product, and focus on service offering [1]. In this volatile environment, many companies may aim at superior user experience (UX) as a differentiating factor [2, 3]. While it is beneficial for companies to invest in product R&D, the new technologies will become standardized and easy to replicate as these technologies move along the life cycle towards the maturity stage.

On the other hand, efforts to improve UX can often create great value and provide companies with new growth alongside the technological development [4]. Thus, UX design is defined as one type of process innovation [5], and can be considered as an essential component to the core technology [4].

Meanwhile, software startups operate under great uncertainty while seeking scalable business models. With scarce resources on time, money, and employees, startups attempt to create products for global markets [6]. Startups are characterized to be temporary organizations that have little to no operating history [6]. Also, they lack formal processes [6]. While new entrepreneurial methods of the Customer development [7] and the Lean startup [8] emphasize the role of customer in the center of business development, prioritization can be hard. Startups need to balance between different tasks that help the company move forward as their primary business objective is to survive [9]. The Minimum Viable User eXperience (MVUX) framework [10] suggests that by assuring good enough UX startups gain direct benefits. Paying attention to UX from early on can give leverage for example by involving users to actively contribute to product development and to spread the word [11]. However, little work has been done to look at how UX creates value from the viewpoint of business models.

The role of UX in product success can not be defined precisely. Though UX has been long considered as an incremental improvement to the business, it is well-suited to be a disruptive (process) innovation as the society moves into the experience economy [12], [4]. In fact, [3] argued that UX can be deemed as another core layer of value, in specific the hedonic qualities of the offering supporting users' emotional values. The actual product functional layer and augmented service layer as defined in [4], are inherent contributors to the overall UX. However, one common issue preventing business practitioners from recognizing the value of UX is that they do not distinguish functional (or pragmatic) value from hedonic value [3]. A growing body of research acknowledges that paying attention to UX plays a major role in business competition [4], [3], [13]. Morville [12] stresses that formulating strategy without embracing UX can be costly, and practitioners can no long afford to neglect UX.

In this paper, we investigate factors affecting UX work in startups as well as the focus of UX in software startups in terms of two-dimensional value creation. Here, we refer to two-dimensional value creation as providing value to user and providing value to business. Our research questions are:

1) What affects UX work in startups?,

2) What is the focus in UX goals in startups, and are they in line with the MVUX framework? and

3) Does UX startups aim at support the two-dimensional value creation?

To answer these questions, we conducted a survey study with 21 respondents from 20 startups. In this paper, we present our results and discuss them as well as existing literature. We also use the results to further validate the MVUX framework [10] and its possibilities to enhance the value creation through UX in startups.

The rest of the paper is organized as follows. Section 2 presents related literature on UX work in software startups as well as how UX is connected to business models through value creation. Research methodology is illustrated in Section 3. Results from the UX survey among startups and the analysis on the survey are given in Section 4 to present UX goals and factors affecting UX work in startups. Finally, the theoretical and practical implications arising from the study are discussed in Section 5, before the conclusions are presented in Section 6.

## 2. RELATED WORK

### 2.1 UX Work in Startups

Startups are characterized by working under great uncertainty and time pressure, with limited resources while lacking operating history [6]. Startups are usually expected to be only temporary organizations that search for a scalable business model. While the success rate of startups is not high, they are disrupting industries by efficiently using digitalization and opportunities in global markets. While working against the odds for survival, the Lean startup method [8] has gained attention among startups. Product development starts by testing hypothesis and seeking validation for product ideas before building anything. Getting out of the building and involving possible customers and users to gain validated learning brings entrepreneurs closer to end-users. The Lean startup also encourages to experiment a product idea's potential with Minimum Viable Products (MVP) that are built with the smallest amount of implementation required to validate a product idea [8].

For developing good UX, startups are struggling with limited skillset of the team as well as with finding test users and light weight methods for user involvement [11]. Due to living with great uncertainty, startups need to carefully balance between value providing and wasteful activities. It is common for startup to start with very limited product versions or MVPs, for which UX plays a role in enabling communicating vision of the product in order to gain feedback for product and business development [14]. For startups to efficiently reach good enough UX, the MVUX framework was established to describe the beneficial elements of UX to implement by startups [10]. The MVUX framework – presented in Figure 1 – consists of main level elements (Attractive, Approachable, Professional, Selling the idea) that contribute to startup being able to effectively achieve their goals for product and business development [10].
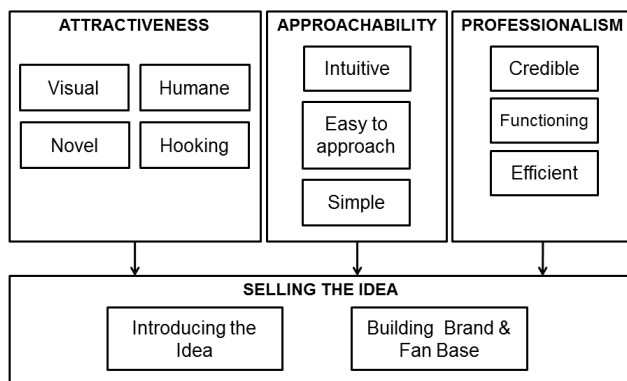


Fig. 1. The MVUX framework according to [10].

In general, scientific literature on UX work and its role to startups is scarce. While some knowledge from for example combining agile and user-centered design practices [15] may be relevant, understanding of how good UX can be achieved in startups is still lacking.

Long term user satisfaction may not be the most important goal for a startup, especially at the early phases when product and business model may still change. However, if neglected, poor UX can result in feedback purely on user interface if users abandon the product before understanding what the product is about [11]. Depending on the stage of startup, the goal for UX can be for example enabling collecting meaningful user feedback, gaining positive attention, having users contribute to product development, or providing data to convince important stakeholders. In the MVUX framework [10], it is indicated that elements Attractive, Approachable, and Professional contribute to the element of Selling the idea. For fast and light UX design, the MVUX framework can be seen as a tool in using UX goals as design drivers. The use of UX design goals may assist in designing for a specific goal [16] that may be sensible in startups that seek validation for a specific idea and vision.

### 2.2 Business Models Create Value through UX

#### 2.2.1 Business models and value creation

The concept of business model has attracted significant attention and raised profound debate among the scholars regarding how to conceptualize business model. For instance, Chesbrough and Rosenbloom [17] conceive business model as a focusing device that explains how economic value could be extracted from a technology or business idea. Morris, Schindehutte and Allen [18] define business model as a set of decision variables, which are inter-connected to create sustainable competitive advantage. Other conceptualization may also include an architectural model [19, 20], a typological model [21], a narrative model [22], a design model [23], and a conceptual canvas tool [24].

Referring to several studies [25, 26], the origin of business model can be traced back to the idea of business: "what a company offers to whom and how". It consists components such as resources and competences, internal and external organizational structure, customer value proposition as well as cost and revenue structure [23].

To uncover how business model links to UX, we have to go back to the basis of business model, which is creation and capturing of value [26]. As pointed out by [22], the notion of value is commonly accepted among the scholars within the business model domains. According to [27], integrating the aspect of value has tremendously influenced the existing streams of business model studies. One of the latest business model conceptualizations is also wrapped around value proposition [22], suggested by Zott, Amit and Massa [28] as a construct that conceptualizes the value creation and value capturing of a company. Thus, value creation and value capture activities and processes are considered to appropriately represent the essences of business model conceptualizations in majority of the definitions [29, 30, 31, 32, 33].

Based on marketing perspective, [34] proposed that value can come from demand (customer) and supply (business) sides, and five forms of value can be derived from value creation process, namely, the net value as utilitarian balancing of benefits and sacrifices, the marketing value related to product (or service) attributes, the derived value as outcome of use, the sale value related to pricing and the rational value that is associated with the benefits expressed in the exchange. By reconciling [34]'s view with typical business

model perspective, it can be conceptualized that business model involves a dual creation process, that is creating value for customer (normally as value creation) and value for business that adopts a specific business model (normally as value capturing). The following sections show how UX is connected to the two sides of value creation.

### 2.2.2 UX and customer value creation

"Value for customer" is defined by Woodall [34] as "any demand-side, personal perception of advantage arising out of a customer's association with an organization's offering". Sawhney [35] describes three types of value that a business can create. The first type is functional value, which refers to features, performance and reliability. Another type is economic value regarding the time and money that customers are willing to spend in exchange of product or service. The last type is emotional value, referring to the feeling or self-expression that a customer experiences during acquisition and utilization of a product or service. Barnes, Blake & Pinder [36] introduced a benefit and cost perspective on value creation, suggesting an assessment of how customers perceive the value in terms of benefit gained and cost reduced.

To connect the value creation concept of business model with customer experience, Osterwalder et al. [37] developed the "value proposition model" to enable a structured way of elaborating the value created by business model through designing "value proposition" for product or service [37]. The value proposition model involves an assessment of value from the customer side and offering side. The customer side provides an assessment of customer needs or "job to be done", exploring what makes them satisfied as gains and dissatisfied as pains [24], [36], [37], [38]. While a customer may not always be a user, end-user's experience affects how well a product or service enables "a job to be done", and value to be gained.

The field of UX deepens the notion of value creation associated with business model. Referring to Hassenzahl's [39] model of UX, users usually construct product attributes with a mental model that combines actual features with personal value, expectations and/or standards. With this concept, product attributes comprise content, presentation, functionality and interaction style, which all affect users' perceptions of value from value proposition and actual product or service offerings [39]. Two categories of user value are defined as pragmatic value (user-perceived usability) and hedonic value that is defined as pleasure-producing qualities [39], [3].

Contrary to the conventional product development logic that places product as the core, Hassenzahl's view [39] suggests that user experience should the center of an offering, while the product or service is designed around it. The value of an offering is actually realized by users or customers during an experience of engaging with the product or service [3]. This logic presumes that customers do not passively receive the value, but rather interacting and co-creating their own experience of value derived from a value realization process [40, 41]. As determined by [42] and [43], companies can not design the experience, however, they can design prerequisites of the desired experience, enabling customers to experience the offering by giving representational artifacts and constructing contexts [44]. This new paradigm points out what a value realization process really is, thus explaining how UX and actual offerings are interwoven to create value for customers.

Overall, the convergence of value concepts in UX and business model studies gives a holistic view on customer value creation. A customer's "job to be done" can be a pragmatic type, representing such factors that fulfil the essential purpose of employing a product or service; or it can be hedonic factors that connecting with feelings

and customer's inner perspective. Gains and pains can also be divided in the same way. Functional factors that represent pragmatic value come from functional outcomes, while hedonic value is connected to arousing certain emotions [37], [45].

### 2.2.3 UX and business value creation

Though UX can create multiple categories of customer value, the costs of UX development can be significant. Nielsen's [46] research suggests that approximately 63% of large-scale software projects went beyond budget due to costs associated to usability engineering. Software development managers often consider UX costs as added expenses [47]. Thus, UX should align with company goals [48], and create value and benefit to business [47], since [48] estimates that first 10% of the software design process, can determine 90% of the end product's cost and performance.

In spite of the variety of literature on how UX creates value for users and customers, how UX creates value for its creators or developers is comparatively under-explored. However, in practice, UX creating superior business value appears to be a common denominator of successful startups that became large enterprises (i.e. Amazon, Google) [49]. From usability engineering perspective, Marcus [47] identified three categories of business value from usability engineering: 1) costs reduction (involving lower development cost, development time, maintenance cost, and redesign cost); 2) sales growth (including increased purchase and transaction, retaining customers and attracting new customers); 3) use effectiveness (reducing user error, increasing productivity and user satisfaction).

From strategy and business model perspective, Sward and Macarthur [50] suggest that capturing business value via competitive advantages through delivering desirable UX is in alignment with a company's strategic intent. The resource-based view of value capture arises from the argument that companies achieve a distinctive position or a competitive advantage by assembling combinations of resources that are scarce and difficult to replicate [51], whereas in UX, it means the UX and design resources that give software companies a unique position in the market. By incorporating engineering and business perspectives, this study proposes three categories of business value that UX can create, specifically for software startups.

One stream of UX literature suggests that value of product or service as perceived by customers can be a key to differentiate a company's position [3], [2], which draws attention to UX design as a strategic intent. In other words, UX can create value to customers while allowing the firm to capture value with differentiation strategy. As identified by [52], providing an attractive consumer experience directly correlates to a firm's competitive advantage. Sward and Macarthur [50] argue that certain elements of UX, for instance, the user interface (UI) is relatively easy to replicate. Thus, UI alone could not contribute to a firm's differentiated position. However, the same study [50] discovered that a firm's ability to provide superior and valuable experiences contributed to the firm's success in remaining competitive. Thus, designing compelling UX becomes an effective strategy to maintaining competitive advantage and a key enabler for business value creation within business models.

In addition to giving differentiating advantage as a generic business value, a survey of literature provides clarity in how UX creates value on business dimension for startups, specifically by enabling mass-market adoption, and fostering customer loyalty and "word of mouth". For startups to grow in a market where Information Technology (IT) is becoming a commodity input [50], focusing on UX is a trade-off that has to be made, which means a startup has to

steer away from being solely technology and product oriented, and realign itself with the experiences it aims to create for customers. From this standing point, UX provides the avenue to "cross the chasm" [53] and builds scalability into business model to be adopted by mass market.

Customer loyalty and retention is also identified to associate with positive customer experience [54], as the experience determines whether a company's customers will ever come back. A firm (such as a startup) following a growth strategy is genuinely interested in expanding and growing customer base. However, as [53] argued, acquiring new customers is challenging, because the same category of product that was attractive and desired in its early stage can have stagnant demand at maturity. Hence, gaining customer loyalty to sustain growth means a firm must employ appropriate UX practice and create intriguing experience to attract and retain customers, and even motive customers to promote its product, service and brand [50].

Overall, when companies are driven towards the strategies that place UX at the core of their customer offerings [2], they could benefit from business value through differentiation, scalability to mass market and customer loyalty. This new way of doing business is described by [55] as the design revolution.

# 3. RESEARCH METHOD AND PARTICIPANTS

## 3.1 Course of Study

In our study, we investigated the focus of UX in startups, factors affecting UX work, and their effect on startups' value creation. Course of the study is presented in Figure 2. Motivation for the study rose from need to validate the MVUX framework [10] as well as in gaining more knowledge on factors affecting UX creation in startups. A survey study was selected as the means to gather data from a variety of software startups. Based on thematic coding of survey results, a connection between startups' focus on UX, and business models and value creation emerged. Consequently, more literature was reviewed to understand the current knowledge on connection between UX, business models, and value. After this, survey results and the MVUX framework were reviewed to understand the role of UX in startups for creating value both to users, and business development.
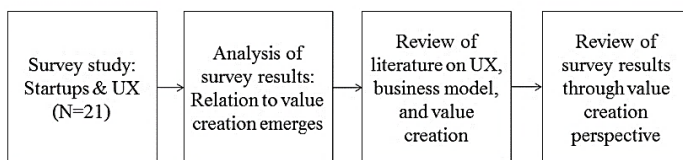
Fig. 2. Description of course of the study.

## 3.2 Survey study

We conducted a survey study among software startups to gain knowledge on their goals for UX as well as on issues affecting the creation of UX. The survey was designed by one researcher after which it was reviewed by two other researchers and tested with 4 startup entrepreneurs. Responses were collected between November 2015 and March 2016. Respondents were found at an entrepreneurship event and by advertising the survey online.

The survey consisted of three main open questions and seven scaled questions with a scale from 1 (Disagree) to 7 (Agree). In addition to these, background information on participants and their startup was collected.

The three open questions were:
•OQ1: Name three of the most important goals regarding UX of your product or service.
•OQ2: What skills and practices help your startup create good UX?
•OQ3: What challenges your startup has in creating good UX?

All respondents answered open questions from which one response to OQ2 and one response to OQ3 were discarded due to being incomprehensible.

Seven scaled questions (Disagree = 1 … Agree = 7) were formed based on literature on UX work in startups [12], [15]. The aim was to understand how well startups were coping with different aspects found challenging in limited sets of startups.

The scaled questions in survey were the following:
•SQ1: We get user feedback that helps us to improve our product.
•SQ2: We collect and use log data to support our UX design.
•SQ3: We have the needed skills to collect meaningful information about users.
•SQ4: We have the needed skills to design for good UX.
•SQ5: We are able to reach our potential users to gain meaningful feedback.
•SQ6: We are able to effectively use the information we collect about users.
•SQ7: We have a clear strategy for how to create the UX we aim for.

SQ7 was answered by 20 respondents, all other questions (SQ1-SQ6) were answered by all 21 respondents. While the sample was limited, the responses were used to give insight and background from startups participating in the study.

Data were analyzed in two parts. First, 63 goals gathered from OQ1 were compared to elements included in the MVUX framework [10] and – when found compatible – categorized accordingly. Categorization was conducted by one researcher and then revised by another researcher. The second part of analysis was of data from OQ2 and OQ3 for which we used thematic coding. A bottom up approach was used where themes minor emerged from data after which they were grouped to form main themes. Again, coding was conducted by one researcher and revised together with two more researchers.

## 3.3 Survey Study Participants

We received 26 responses from which 5 were discarded due to the mismatch with our definition of a software startup - i.e. the company being founded less than 10 years ago and having less than 50 employees. From the remaining 21 responses, 2 were from the same startup resulting in data from 20 different companies. Startups' country of origin was in Finland (14), Hong Kong (4), Australia (1), Armenia (1), and Belgium (1). Six of the startups were reported to be spin-offs from another company or research institution. Status of the startups was reported in regards of having received funding (7) and currently having paying customers (14). Also, six of these startups reported having both paying customers and external funding. Furthermore, six startups were in early phase of product and business development with no customers while majority of startups (14) had already established at least some revenue from paying customers.

Respondents' roles in startups varied: They were CEOs (7), in technical or engineering roles (5), founders (4), managers or leaders (3), UX designer (1), and innovator (1). In addition to the varying roles, all but one (20) of respondents were working on multiple areas within startup. In Table 1, we present the areas of work that respondents specified to be working on in their startup.

**Table 1. Areas in which respondents work in the startups**

| Area of work | Number of respondents |
|---|---|
| Business development | 14 |
| Marketing | 14 |
| Sales | 12 |
| Product development | 16 |
| Software development | 10 |
| UX design | 13 |

It is notable that while only one respondent was a UX designer, 13 reported being involved in UX design. Respondents had educational background in information technology (14), management and commerce (8), engineering (6), natural and physical sciences (3), creative arts (2), and society and culture (2). The level of education of respondents was mainly bachelor (7) and master (12) level but included also one licentiate and one PhD. Age of respondents that provided their age (16) varied between 25-54 years with the average of 37,5 years. Respondents had an average of 15,3 years of relevant working experience.

## 4. RESULTS

## 4.1 Abilities for UX Work

Seven scaled questions were aimed for understanding startups' ability to collect meaningful user information, and conducting UX design. The means are presented in Table 2. Means for SQ3, SQ4 and SQ6 fall close to the indifferent option. Furthermore, we looked at how answers were divided and possessing skills for designing good UX (SQ4) received the most indifferent answers (9). The reasons for this can not be clearly explained based on the survey data, yet estimation could be that respondents do not have a clear understanding or measures of how they are performing with UX. Among surveyed abilities, respondents agreed the most – selecting 6 or 7 on scale – on SQ5 in being able to contact users (10) and SQ1 in getting feedback (11). However, in regards of having skills to collect meaningful information about users (SQ3), fewer respondents clearly agreed (4).

**Table 2. Means of answers to scaled questions**

| Scaled Question | Mean (Standard deviation) |
|---|---|
| SQ1: We get user feedback that helps us to improve our product. | 5,4 (1,36) |
| SQ2: We collect and use log data to support our UX design. | 3,5 (2,16) |
| SQ3: We have the needed skills to collect meaningful information about users. | 4,3 (1,39) |
| SQ4: We have the needed skills to design for good UX. | 4,2 (1,36) |
| SQ5: We are able to reach our potential users to gain meaningful feedback. | 5,2 (1,40) |
| SQ6: We are able to effectively use the information we collect about users. | 4,0 (1,38) |
| SQ7: We have a clear strategy for how to create the UX we aim for. | 3,3 (1,56) |

Hardest areas in UX work based on our survey were the use of log data to support UX as well as having a clear strategy for reaching the wanted UX. Use of log data may not be suitable for needs of all startups hence we can not predict if they would benefit from better utilizing it. However, since majority of startups (14) had already paying customers, using log data to recognize user behavior could be beneficial in determining which parts of the product are used the most. This would enable the resource allocation for parts of the product that create the most value to user and/or customer, possibly leading to improved user satisfaction and more business.

## 4.2 Factors Affecting UX Work in Startups

Based on answers to the open questions OQ2 and OQ3, we extracted 56 factors. First, with the bottom up approach to thematic coding, seven themes emerged from data which were then used to form sub-categories. Then, the sub-categories were grouped to form three main categories of factors affecting UX work in startups: Strategy, Team qualities, and Interaction with users. Results of the thematic coding - including distribution of factors - are presented in Table 3. Next, we will discuss each main category.

**Table 3. Categorization of factors affecting UX work in startups**

| Main category | Sub-category | Number of factors identified (N=56) |
|---|---|---|
| Strategy | Product qualities | 6 |
| | Resource allocation | 8 |
| Team Qualities | Expertise in UX | 15 |
| | Expertise of domain | 5 |
| | Mindset | 6 |
| Interaction with Users | Feedback | 7 |
| | User involvement | 10 |

### 4.2.1 Strategy

According to our analysis, strategic choices on *Resource allocation* and *Product qualities* affect decisions - and actions taken - for creating good UX. Product qualities that complicate creating good UX were complexity of product and multiple user groups. Two startups reported having challenges in creating easy to use solutions to a complex product. In addition, being able integrate the use of product to existing workflow was seen as a challenge. However, when successfully implemented, integration was considered to contribute into creating good UX.

Lack of resources is considered a fundamental characteristic of startups. In our study, we also found the resource allocation affecting the creation of UX. Factors that startups struggle with in creating good UX include money, time, and general lack of resources. In this category we did not include human resources as they are discussed in the Team qualities section. Prioritization of adding features or "quick and dirty" solutions over using time for UX design were mentioned in responses. While this approach may generate short term benefit such as revenue from a specific customer, it may also result in creating need to re-design parts of the product later. More sustainable in terms of satisfying UX can generate wider interest in customers and also give a more professional image of the startup. Strategically, startups should consider the costs and value created in efforts aiming to good UX. Also, the cost of ignoring UX should be acknowledged.

### 4.2.2 Team Qualities

The startup team's qualities have a big influence on how and what kind of UX can be created. Three areas in which the team's qualities relate to UX were *Expertise in UX*, *Expertise of domain*, and *Mindset*. Not surprisingly, expertise in UX was reported as the main enabler for creating good UX by two respondents while seven reported the lack of knowledge, training, experience, or a designated UX designer, to be hindering creation of good UX. Specific UX related expertise that was reported as beneficial were visual design and gamifying experience. Also, use of design guidelines and following best practices was considered an advantage for UX creation.

The domain expertise was seen as an enabler for creating good UX. Understanding of and experience in domain where the product was targeted for, as well as technical expertise, were considered enabling creation of good UX in six startups. When considering startups, actively learning things related to their business gives good basis for the whole team to understand also their users. As a source of knowledge of domain, previous working experience was identified. This is in line with [11], where it is recognized that product ideas in startups often come from personal needs or experience in a specific domain.

The third theme rising from the data was the mindset. Instead of specific skills, the right kind of mindset was reported as influencing UX work. Having a too programming-centric mindset hinders creation of good UX while thinking from the user's perspective, having "common sense", intuition, and self-critique can help. The general mindset also affects to how important UX is perceived as: one respondent felt that UX was not an important factor when product idea was very appealing to people.

Skills and abilities of the team in startup plays a major role. When skills are lacking, the options to acquire them are to recruit, outsource, or educate a team member. All these require resources - money or at least time - which means that the return needs to be big enough. Startups need to perceive UX as creating business value in return of their investment in resources. With scarce resources to spend, startups may recruit new co-founders to fill the knowledge gap. Another option would be to seek for voluntary help in entrepreneurs' network as reported in [11].

### 4.2.3 Interaction with Users

Interaction with users was divided into two sub themes of *Feedback* and *User involvement*. Effective use of feedback was considered as an enabler in creation of UX in five different startups. Then, actively collecting and using feedback, reacting to it, and repeating this cycle came up in responses. One startup described feedback as the main driver in creating UX. Challenges regarding feedback were related to reaching potential customers. Also, dealing with feedback in a successful way was perceived challenging by one startup. However, means for collecting feedback did not come up from the responses. Successfully using feedback enables startup to better understand the needs of customers which benefits not only in development of UX but also business offering as a whole.

Respondents reported a wide variety practices for user involvement in product development. Such practices were observation, paper prototyping and user tests as well as use of usage data with analytics. Together eight startups reported using these practices, two of them in addition reported the use of feedback. Furthermore, different forms of interaction with users were mentioned by respondents from 11 startups as an enabler for creating good UX. Results imply that the rest of the participating startups (9) are not actively involving users in their process of creating UX or respondents were not aware of the means for such activities.

## 4.3 Focus in UX Goals

We extracted 65 goals from the responses (open question OQ1) and compared them to the MVUX framework presented in [10]. Our findings show that for the major part (61), goals are in line with the framework. Goals that we found not possible to categorize in the framework were user-centric (2) and interactive (2). The conclusion was that an interactive user experience can aim at different goals – e.g. intuitive or hooking. Furthermore, user-centric a was regarded as such a general goal that it would not suit any of the elements.

In Table 4 we present division of extracted goals in terms of elements of the MVUX framework. The goals were mainly categorized in elements of Approachable (26) and Professional (23). Goals related to contributing to product being Attractive appeared (10) while only two goals were categorized to Selling the idea. The three most common goals were efficient (13), easy (11), and intuitive (8). Emphasis of goals was clearly on more pragmatic aspects and rather in usability than UX where as the MVUX framework suggests that considering all the main elements is beneficial for startups.

On theoretical point of view, elements Attractive, Approachable and Professional create value to user. However, business value is harnessed by being able to complete the last element, Selling the idea. If startup fails with one of the three elements contributing to Selling the idea, startup might not reach its full business potential. This might be due to not being able to keep customers for a longer period or not being able to attract new customers. For startups, keeping the early customers can be very beneficial also in terms of receiving feedback actively or co-creating with users as noted in section 4.2.3.

**Table 4. Categorization of UX goals in terms of the MVUX framework**

| Main element (# of goals categorized, total N=61) | Sub-element | # of goals categorized to sub-element |
|---|---|---|
| Attractive (10) | Visual | 4 |
| | Humane | 2 |
| | Novel | 0 |
| | Hooking | 4 |
| Approachable (26) | Intuitive | 8 |
| | Easy | 11 |
| | Simple | 7 |
| Professional (23) | Credible | 4 |
| | Functioning | 7 |
| | Efficient | 12 |
| Selling the Idea (2) | Introducing the idea | 0 |
| | Building brand & fan base | 2 |

# 5. DISCUSSION

In this paper, we have investigated the UX goals of software startups and the factors affecting startups when developing UX as either core or complementary to their essential offerings. We conducted a survey study with responses from 20 software startups and complemented the study with a literature review. Based on results from our survey, we identified that in certain cases, UX development is treated as consisting mostly of pragmatic elements. Furthermore, UX was affected by strategy, team qualities, and ability to interact with users. While some startups found UX not worth prioritizing, for estimating the value created by UX, startup should consider two-dimensional value creation: for users and for business development. Our findings bring new insights to the literature on startups, UX, and business models. Limitations of this study include a limited set of participating companies and thus it can not be generalized to all kinds of startups. Also, with an online survey study the responses can not be fully verified for authenticity.

The findings for the study are enabled by a thorough review on business model and value creation literatures. We identified that the core of business models is about value creation and capture, which is in line with the aims of UX in customer value creation [39], [3], that draws upon the various types of value which can be created through UX practices. On the business value side, the study utilized various business model literatures, and landed on Osterwalder et al.'s [37] value proposition framework to argue that UX should not be treated as UI design. Instead, UX could and should make business sense by creating the desired pragmatic and hedonic value for customers.

As part our study, we also sought to further validate the MVUX framework initially introduced in [10]. According to our findings, startups focus on a limited aspect of UX. In contrast, the MVUX framework emphasizes a more holistic – while focused – view to UX that would ensure further development of both product and business in startups. Based on our findings, the MVUX framework constitutes to the two-dimensional value creation by including the pragmatic and hedonic aspects of UX while also aiming to contribute to business value. For thorough validation of the MVUX framework, a larger sample of startups should be included to test the usefulness of the MVUX framework as a tool for design. The study does not only contribute to the theoretical development of UX and its business value for startups, but also the corresponding managerial implications on creating the awareness of UX-business model integration.

The academic contribution of this paper lies within the UX and startup literatures but also contributes to the business model literature, through expanding UX's value for users (as commonly discussed in UX literatures) to its value to business by discovering the common link, value creation on two dimensions (customer and business). The research identified the phenomenon of UX suggested as a critical component in business success, especially in the case of software startups from theoretical view point. In reality, it resides in the resource consuming and cost creating side of the business or is treated as a cost center in software startups. UX's revenue generating capability is rarely realized as a profit center. This study thus stresses the need to understand the true value of UX and how it can enable the realization of business value, especially for digital and hi-tech startups. The novelty of the research relates to integration of UX literature with business model conceptualization to explain why UX should be treated as an indispensable component of the startup's business and where UX's true business value lies. Future work includes studying larger samples of startups as well as comparing performance between startups that allocate resources to UX creation and those that do not.

The practical implications of this paper relate to the possibility of identifying the misperception and challenges that hinder startups from truly harnessing UX to realize more business value. Recognizing factors affecting UX work, practices and tools can be developed to serve startups' needs. Furthermore, by aiming the focus of UX to acknowledging also the hedonic aspects, startups can find new ways to achieve business value. These include creating differentiated value, scaling up business as well as growing and retaining customer base. It brings the missing and hidden business value of UX to light, which is an indispensable step to unlocking the true potential of UX. In the paper, the most recent insights on value and value creation were used to reflect the connection between UX and business model for enhancing and structuring the UX building process more integrated into business process within startups. The study emphasized that startup and business practitioners in general need to understand the value and value creation as interactional and contextual. In addition to acknowledging the importance of UX, the paper proposes the MVUX framework to be used to developing managerial tools for building better UX practices.

# 6. CONCLUSIONS

The research discovered that UX is suggested as a critical component in business success, especially in the case of software startups from theoretical view point. However, in reality, it is considered by startup companies as resource consuming activities, or a cost center. The revenue generating capability of UX is rarely realized as a profit center. Hence, the study proposes the dyadic dimensions of UX, creating human value as embodied in usability and UX design, while realizing business value, especially for software startups. Moreover, the MVUX framework [10] was further validated with survey data and existing literature. It was concluded that the MVUX framework supports the two-dimensional value creation by emphasizing coverage of both practical and hedonic aspects that lead to gaining business value. Furthermore, the study recognized factors affecting startups' UX work to be related to strategy, team qualities, and interaction with users. For startups to be able to achieve the optimal UX, these areas need to be in line for supporting the UX work.

As argued by [3], a digital company which seeks to differentiate its products or services can not achieve the desired results by simply adding more features or services to the existing offering as incremental enhancement. Thus, for a software company, creating differentiating experience should carry as much weight as how product or service is created if not less. This means that if firms want to transition into the experience market [2], it is critical to realize and understand the new capabilities required. While aesthetics design and good usability is critical, and is commonly understood and considered equivalent to UX among the surveyed startups, on their own these UI elements are unlikely to be sufficient to provide desired business growth. Failing to recognize the gap between a firm's current UX design practices and those required for developing growth-driving UX is likely to cause the companies to replication or "doing-more-of-the-same" [3]. Thus, it is imperative for startups to utilize UX to create value that is desired and appreciated by the customers on one dimension, while the created customer value can be translated into business value, driving startup growth on the other dimension. Such process would re-enforce startups' emphasis on UX, creating a positive loop, or "virtuous development cycle".

# 7. REFERENCES

[1]  Cusumano, M.A. 2008. The changing software business: Moving from products to services. *Computer* (Long. Beach. Calif.). 41.1, 20–27.

[2]  Pine II, B.J., Gilmore, J.H. 1999. The Experience Economy, Work is Theatre and Every Business a Stage. *Harvard Business School Press*, 1–4.

[3]  Sirotkin, A., McCabe, B. 2011. The New Experience for Business: Why User Experience Is the Differentiation Strategy in the Cloud Context. In: Marcus, A. (ed.) *Design, User Experience and Usability Theory, Methods, Tools and Practice. First International Conference, DUXU 2011 Proceedings*. pp. 491–499. Springer, Orlando

[4]  Passera, S., Smedlund, A., Liinasuo, M., Aikala, M. 2015. Designing Boundary Objects for the Sales of Industrial Services: How to Support Value Co-creation Through User Experience. *Available at SSRN: http://dx.doi.org/10.2139/ssrn.2648148*

[5]  Teece, D.J. 1986. Profiting from technological innovation: Implications for integration, collaboration, licensing and public policy. *Res. Policy*. 15, 285–305.

[6]  Paternoster, N., Giardino, C., Unterkalmsteiner, M., Gorschek, T. and Abrahamsson, P. 2014. Software development in startup companies: A systematic mapping study. *Information and Software Technology*.

[7]  Blank,S. 2005. The four steps to the epiphany, 1st ed. *CafePress*.

[8]  Ries, E. 2011. The Lean Startup: How Today's Entrepreneurs use Continuous Innovation to Create Radically Successful Businesses. *Random House LLC*.

[9]  Coleman, G., O'Connor, R. 2008. An investigation into software development process formation in software start-ups, *Journal of Enterprise Information*, 21 (6). pp. 633-648.

[10] Hokkanen, L., Kuusinen, K., & Väänänen, K. (2016). Minimum Viable User EXperience: A Framework for Supporting Product Design in Startups. *In International Conference on Agile Software Development*, *Springer International Publishing*. (pp. 66-78).

[11] Hokkanen, L., & Väänänen-Vainio-Mattila, K. (2015). UX work in startups: current practices and future needs. In *International Conference on Agile Software Development, Springer International Publishing*. (pp. 81-92).

[12] Morville, P. (2004): User Experience Design, http://semanticstudios.com/user_experience_design/.

[13] Djamasbi, S., McAuliffe, D., Gomez, W., Kardzhaliyski, G., Liu, W., Oglesby, F. 2014. Designing for success: Creating business value with mobile user experience (UX). In: Nah, F.F.-H. (ed.) *HCI in Business. First International Conference, HCIB 2014 Held as Part of HCI International 2014 Proceedings*. pp. 299–306. Springer, Heraklion

[14] Hokkanen, L., Kuusinen, K. and Väänänen, K.(2015): Early product design in startups: Towards a UX strategy, in *Product-Focused Software Process Improvement. Springer,* pp. 217-224.

[15] Jurca, G., Hellmann, T. D., & Maurer, F. 2014. Integrating agile and user-centered design: a systematic mapping and review of evaluation and validation studies of agile-UX. *In Agile Conference (AGILE), 2014 IEEE*. (pp. 24-32).

[16] Kaasinen, E., Roto, V., Hakulinen, J., Heimonen, T., Jokinen, J., Karvonen, H., Keskinen, T., Koskinen, H., Lu, Y. and Saariluoma, P. 2015. "Defining user experience goals to guide the design of industrial systems," *Behaviour & Information Technology*, vol. 34, pp. 976-991.

[17] Chesbrough, H., & Rosenbloom, R. S. 2002. The role of the business model in capturing value from innovation: evidence from Xerox Corporation's technology spin-off companies. Industrial and corporate change, 11(3), 529-555.

[18] Morris, M., Schindehutte, M., Allen, J. 2005. The entrepreneur's business model: Toward a unified perspective. J. Bus. Res. 58, 726–735.

[19] Timmers, P. 1998. Business Models for Electronic Markets. *Electronic-Markets*. 8, 3–8.

[20] Dubosson-torbay, M., Osterwalder, A., Pigneur, Y. 2002. E-Business Model Design, Classification, and Measurements. *Thunderbird Int. Bus. Rev.* 44, 5–23.

[21] Osterwalder, A., Pigneur, Y., Tucci, C.L. 2005. Clarifying Business Models: Origins, Present, and Future of the Concept. *Commun. Assoc. Inf. Syst.* 16, 1–25.

[22] Magretta, J. 2002. Why business models matter. *Harv. Bus. Rev.* 80, 86–87.

[23] Demil, B., Lecocq, X. 2010. Business model evolution: In search of dynamic consistency. *Long Range Planning*. 43, 227–246.

[24] Osterwalder, A., Pigneur, Y. 2010. Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers. *John Wiley and Sons, Inc., Hoboken, New Jersey.*

[25] Ahokangas, P., Atkova, I. 2013. Unveiling the Janus face of the business model. In: *RENT Research in Entrepreneurship and Small Business Conference*. p. Volume 29.

[26] Xu, Y., Kopsakangas-Savolainen, M., Ahokangas, P., Li, F. 2016. Ecosystemic Business Model and Value in the Peer-To-Peer Smart Grid. In: *The proceedings of 2016 Global Energy Interconnection*. pp. 858–871. Global Energy Interconnection, Beijing.

[27] Nielsen, C., Lund, M. 2015. The Concept of Business Model Scalability. *Soc. Sci. Res. Netw.* 1, 1–20.

[28] Zott, C., Amit, R., Massa, L. 2010. The business model: Theoretical roots, recent developments, and future research. IESE Res. Pap. 3, 45.

[29] Hamel, G. 2000. Leading the Revolution. *Harvard Business School Press, Boston.*

[30] Afuah, A., Tucci, L.C. 2001. Internet business models and strategies: Text and cases. *McGraw Hill, New York.*

[31] Weill, P., Vitale, M.R. 2001. Place to Space: Migrating to eBusiness Models. *Harvard Bus. Sch. Press Books*. 1.

[32] Van der Vorst, J., Van Dongen, S., Nouguier, S., Hilhorst, R. 2002. E-business Initiatives in Food Supply Chains; Definition and Typology of Electronic Business Models. *Int. J. Logist. Res. Appl.* 5, 119–138.

[33] Hedman, J., Kalling, T. 2003. The business model concept: theoretical underpinnings and empirical illustrations. *Eur. J. Inf. Syst.* 12, 49–59.

[34] Woodall, T. 2003. Conceptualising "Value for the Customer": An Attributional, Structural and Dispositional Analysis. Acad. Mark. Sci. Rev. 12, 1–42.

[35] Sawhney, B.M. 2003. The Seven Fundamentals of Value, *Available at:* http://www.cio.com/article/2441854/it-organization/the-seven-fundamentals-of-value--according-to-mohanbir-sawhney-.html.

[36] Barnes, C., Blake, H., Pinder, D. 2009. Creating and Delivering Your Value Proposition: Managing Customer Experience for Profit. *Kogan Page, London, Philadelphia.*

[37] Osterwalder, A., Pigneur, Y., Bernarda, G., & Smith, A. 2014. Value proposition design: How to create products and services customers want. *John Wiley and Sons, Inc., Hoboken, New Jersey.*

[38] Romero, D., Molina, A. 2015. A Multidisciplinary Framework and Toolkit to Innovate Customer-Centric New Product Development. In: *Proceedings: 21th International ICE-Conference on Engineering, Technology and Innovation. ICE Conference.*

[39] Hassenzahl, M. 2004. The Interplay of Beauty, Goodness, and Usability in Interactive Products. *Hum. Comput. Interact.* 19, 319–349.

[40] Sward, D. 2007. User Experience Design a Strategy for Competitive Advantage. *AMCIS 2007 Proc.* 14.

[41] Grönroos, C., Voima, P. 2013. Critical service logic: Making sense of value creation and co-creation. *J. Acad. Mark. Sci.* 41, 133–150.

[42] Patricio, L., Fisk, R.P., Falcao e Cunha, J., Constantine, L. 2011. Multilevel Service Design: From Customer Value Constellation to Service Experience Blueprinting. *J. Serv. Res.* 14, 180–200.

[43] Sanders, E.B. 2002. Scaffolds for experiencing in the new design space. *Inf. Des.* 1–6.

[44] Gentile, C., Spiller, N., Noci, G. 2007. How to Sustain the Customer Experience: An Overview of Experience Components that Co-create Value With the Customer. *Eur. Manag. J.* 25, 395–410.

[45] Pokorná, J., Pilař, L., Balcarová, T., Sergeeva, I. 2015. Value Proposition Canvas: Identification of Pains, Gains and Customer Jobs at Farmers' Markets. *Agris on-line Pap. Econ. Informatics.* VII, 123–130.

[46] Nielsen, J. 1993. Usability Engineering. *Academic Press, Boston.*

[47] Marcus, A. 2005. User Interface Design's Return on Investment: Examples and Statistics. In: Bias, R.G. and Mayhew, D.J. (eds.) *Cost-justifying usability: an update for an Internet age. Morgan Kaufmann Publishers, San Francisco.* pp. 17–40.

[48] Smith, P.G., Reinertsen, D.G. 1991. Developing products in half the time: new rules, new tools. *Van Nostrand Reinhold, New York.*

[49] Crow, D. 2005. Valuing usability for startups. In: Bias, R.G. and Mayhew, D.J. (eds.) *Cost-justifying usability: an update for an Internet age. Morgan Kaufmann Publishers, San Francisco.* pp. 165–184.

[50] Sward, D., Macarthur, G. 2007. Making User Experience a Business Strategy. In: Law, E., Vermeeren, A., Hassenzahl, M., and Blythe, M. (eds.) *Towards a UX Manifesto COST294-MAUSE affiliated workshop.* pp. 35–43.

[51] Bharadwaj, A. 2000. A Resouce Based Perspective on Information Technology Capability and Firm Performance: An Empirical Investigation. *MIS Q.* 24, 169–196.

[52] Swallow, D., Blythe, M., Wright, P. 2005. Grounding Experience: Relating Theory and Method to Evaluate the User Experience of Smartphones. *Identity.* 29, 91–98.

[53] Norman, D.A. 1999. The Invisible Computer: Why Good Products Can Fail, the Personal Computer Is So Complex, and Information Appliances Are the Solution. *Personnel Psychology*, 52(3), 789.

[54] Garrett, J.J. 2010. The Elements of User Experience: User Centered Design for the Web. *New Riders.*

[55] Cooper, A. 1999. The Inmates Are Running the Asylum: Why High Tech Products Drive Us Crazy and How to Restore the Sanity. *Sams Pearson Education, Carmel.1.*