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User-centric service design in concept development

Case start-up company growth

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User-centric service design in concept development: Case start-up company growth

Abstract

This thesis is an empirical case study that reveals simultaneous development of theoretical and practical contributions to the field of service design. The practical application of service design includes the co-creating and implementing a new service from conception. This thesis highlights the process of utilizing well-known service design strategies to stimulate growth within a start-up company in Finland. Theoretical contributions include the development of a Diminishing Double Diamond design process, implementation of the aforementioned design process and an in-depth analysis of main ideologies that connect service design to psychology. The motivational purpose of this thesis is to promote growth within a start-up company. The primary objectives are to collect true user insights, analyze insights with a high empathic aptitude, co-create value and conceptualize highly viable solutions for strategic growth. A new service has been strategically designed to support target users as they build and test early-stage mobile applications (apps). The case company that is studied offers a software tool for prototyping early-stage apps. It [software tool] assists in mobile application development by enabling app developers can remain focused on visual design, aesthetics, user interface and/or uses experience. Developing a new subsidiary service to this prototyping tool is the underlying focus throughout this thesis. In addition, this thesis describes the process of using service design and redesign thinking to reveal (and offer a highly viable solution for) a major disruption in the relationship between two groups of specialists in the field of mobile application development.

Keywords: | Service design, redesign thinking, concept development, co-creation, empathic aptitude, recipient-centric, growth strategy

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Contents

Abstract	ii
Acknowledgements	iii
Contents	iv
List of Figures	v
List of Pictures	v
List of Tables	v
List of Appendices	vi
List of Abbreviations and Symbols.....	vii
1.0 Introduction	8
1.1 Problem Area	10
1.2 About the Case and Company.....	11
2.0 Research Framework and Design.....	13
2.1 Relevant Terms and Literature	14
2.2 Scope and Frame of Reference.....	29
2.3 Aim and Objectives	31
2.4 Research Questions	31
2.5 Methodological Overview and Theoretical Support.....	32
2.6 Limitations.....	34
2.7 Delimitations	34
3.0 Applied Methods	36
3.1 Designing a Design Process	37
3.2 Development of Diminishing Double Diamond.....	39
3.3 Methods of Information Collection	43
3.4 Methods of Analysis.....	47
3.5 Methods of Conceptualization	48
3.6 Practicing Service Design within the Case Company	52
4.0 Results.....	55
4.1 Summary of Results	56
4.2 Additional Findings	57
5.0 Future Works and Recommendations.....	61
5.1 Balance-centricity	62
5.2 Starting Point of a Design Process	63
5.3 Measuring Frustration.....	63
5.4 Design in the C-Suite.....	65
6.0 Discussion	66
6.1 Research Questions Revisited	67
6.2 Benefits of Service Design.....	68
6.3 A Brief Message from the Founder.....	68
6.4 Closing Reflection.....	69
About the Author.....	70
References	71
Appendices.....	76

List of Figures

Figure 1: Start-up Venn diagram with Phases (Loikkanen, 2016).	23
Figure 2: Double Diamond Design Process by Design Council.	25
Figure 3: Human-Centered Design Model by IDEO.org.	26
Figure 4: Punnett's Square of Knowns versus Unknowns (2015).	28
Figure 5: Visual Frame of Reference.	30
Figure 6: Merged Double Diamond Model with HCD Model.	37
Figure 7: Diminishing Double Diamond Design Process.	39
Figure 8: Spectrum of Achievement over Knowns and Unknowns.	42
Figure 9: User-view Feedback (closed Slack communication, 2016).	45
Figure 10: Maslow's Hierarchy of Needs alongside User Journey Phases.	47
Figure 11: Business Model Canvas of AppTender Concept.	50
Figure 12: Parallel Business Model Comparison with Abridged Blueprint.	52
Figure 13: Starting Point as the Focus in a Design Process (Newman 2010, adaption)..	63

List of Pictures

Picture 1: Design Thinking Workshop (M. Rancourt of The New School at TNW'16).	17
Picture 2: Whiteboard User Journey Map of Onboarding Process (Chapman, 2016).	43
Picture 3: Persona Planning and User Target.	46
Picture 4: Archetypes with Potential New User Type.	46
Picture 5: Whiteboard Visualization of AppTender Concept.	49
Picture 6: Photo of Andrew Chapman Presenting Insights (Chapman, 2016).	57
Picture 7: The Customer is a Custom User.	57
Picture 8: The Customer is Always Experiencing.	58
Picture 9: Panel Discussion at Slush Conference (2016).	61
Picture 10: Innovation through Frustration.	64

List of Tables

Table 1: Varying Definitions of Service Design.	14
Table 2: Gummesson's Logic of the Goods- and Service-Centered Views.	16
Table 3: Eight Occurrences that Explain Empathy (Batson, 2011).	19
Table 4: Varying Terminology for User-centricity (design).	21
Table 5: Methodological Overview.	32
Table 6: Diminishing Double Diamond Design Process.	40

List of Appendices

Appendix 1(1): Comprehensive User Study	77
Appendix 2(1): AppTender Proof of Concept Design Document	82
Appendix 3(1): Version Specific Release Notes by Adobe Creative Cloud	86
Appendix 4(1): Service Design Activity and Project Log	88
Appendix 5: Dev-Opps Document for Improved User Experience	91
Appendix 6: Implemented Learning Service [Video File 1]	92
Appendix 7: Implemented Learning Service [Video File 2]	93
Appendix 8: Implemented Learning Service [Video File 3]	94
Appendix 9: Implemented Learning Service [Video File 4]	95

List of Abbreviations and Symbols

Symbol	Description
©	Copyright

Abbreviation	Description
App	Application (referring to computing software, namely mobile application software)
B2B	Business to business
B2C	Business to customer (segment)
CSS	Cascading style sheet
Dev-Opps	Development opportunities
*Hi-Vi	High viability or highly viable
HCD	Human-centered design
HTML	Hyper text markup language
MLS	Most lovable solution
p.	on Page
pp.	Page range (from page, to page)
SaaP	Software as a product
SaaS	Software as a service
SDL	Service dominant logic
Tech	Technology
UX	User experience

**Indicates term specific to this thesis*

1.0 Introduction



This thesis serves as an empirical investigation and case study that uses some of the most essential modes of thinking that make up the practice of service design. The case that is studied throughout this thesis involves strategic software development in the mobile-tech and design industry. The practical application of service design within the start-up mobile-tech and software application development industry is the main focus. This thesis is concentrated on the development of a software tool as a service and the co-creation of secondary services that support it [case company's software tool].

Mobile software applications (mobile apps) have become a common, if not, essential part of development in mobile technology. The majority of mobile devices operate with the use of apps. There is a fast growing market for a wide range of devices from watches to televisions that have adopted app technology. An overwhelming majority of people, in general, use smartphones on a daily basis. Nearly all owners of smartphones and other mobile devices (such as tablets and laptops) use apps. It is clear and easy to see that app development is a large market with high demand.

App development has been a steadily growing industry since as early as the 1970's (Clark, J. F. 2012). Clark (2012) explains that Nokia was among the first technology companies to use the app concept. Clark continues to explain that some of the first concepts of apps within mobile-tech came in the form the video game *Snake*. "Competitors followed, adding games like *Pong*, *Tetris* and *Tic-Tac-Toe* to their phones." It was during this period that the first versions of apps began to appear (Clark 2012). It was also shortly after, that a market for apps began to emerge. The rapid development of this market is made up of multiple disciplines ranging anywhere from digital graphic design to software engineering. Teams and start-up companies in software development have been expanding the start-up ecosystem, ever since. The expansion has led to extraordinary development. However, the expanding ecosystem has also created a fragmented market in app development. This fragmentation is the problem area in focus throughout this thesis.

The aim throughout this thesis is to utilize core principles of service design to generate highly viable solutions and concepts (as service) for growth. In other words, solutions in the form of a service are meant to enhance the user's overall experience, while at the same time, stimulate growth strategies within company.

The primary objective of this thesis is to successfully implement service design strategies that enhance the experience of developing mobile apps. Service concepts and solutions

identified in this thesis are subsidiary supports to a software that enables users to design and test early-stage apps, without the need to code functions.

Building an app is often a long and complicated process that usually requires layers of coding. Coding is the process of converting a series of instructions into machine language so that the computer will function in a specific way. Add-ons are known as an extension to an already existing software program. An add-on is an extra piece of software that is coded to communicate with a larger program. In this case, the add-on is a prototyping tool and the software program that it is plugged into is Adobe Systems, Photoshop. The add-on provides the user with a customized experience and the service that is offered is the coding support to build prototypes of apps. Apps are built with the prototyping tool (smaller software) that is plugged-in to communicate with Photoshop (larger software). When app developers use this tool, they are able to make large changes and rapidly test the app prototypes without having to code or re-code various versions of their designs (for example, App Version 1.0, App Version 1.1, App Version 1.2 and versions continued). Service design strategies are applied in order to develop the service and improve the users' experience. By utilizing a variety of service design strategies, it was expected to co-create value and ideate new services that will promote growth within the case company.

The underlying focus of this thesis is concentrated on the process of developing new subsidiary service concepts that support the case company's primary offering (as mentioned above). The grand purpose is to offer theoretical and practical contributions to the field of service design. In addition, this thesis utilizes principles of service design to offer a solution for improving the relationship between two prominent groups of specialists in the industry of software application development.

1.1 Problem Area

The problem area describes the process of identifying and understanding disruptive conditions. It is the core belief that if these conditions are identified and addressed (with service design efforts), then there will be opportunities for significant growth within the case company.

1.1.1 Fragmented and Inefficient App Development

App development has become one of the most fragmented markets on a global scale. The app developing community has become equally as fragmented as the market itself. In a fragmented community like app development, resources are limited and the acquisition of

additional resources can often be costly. Resources can come in many forms, but for the interests of this thesis, content is considered to be the main resource in app development. App developers typically collect content and small works from numerous content creators. This content is then used to develop a larger project. This is known as porting (Clark 2012). Developers often port along a variety of platforms to get the material that they need to build an app. This is usually costly and many times not straightforward. Porting has been known to create a clear divide between app developers; content creators are on one side and content consumers are on the other side. This divide is even further segmented within the groups. On the side of content creators, other creators are in high competition for small works and recognition. On the other side, content consumers are segmented from other consumers in competition to acquire the best resources.

1.1.2 Content Creators versus Content Consumers

For the interests of this thesis, it is essential to understand content, content creation and content consumption. **Content creators** are anyone who generates content for the purpose of it being used as a component of another piece of work. **Content consumers** are anyone or organization that acquires content for the purpose of developing a larger piece of work. Content is the basis of what the work is made of. For example, if a songwriter writes a song for another artist to perform, then the songwriter is the content creator; the performing artist becomes the content consumer and the song is the content.

Creative content can include (but does not limit) that of digital and non-digital artworks, sounds, illustrations, graphics, designs, small software programs, lines of code, lines of prose, short stories, poetry or any other creative constructs. The creators that generate this type of content in the app developing industry do so with knowledge that their creations will be re-purposed. In other words, an illustration of a tree might be used as a background in another graphic, inside an app.

1.2 About the Case and Company

At the time that this thesis was developed, the case company in collaboration had been recognized as a micro start-up company (founded in 2013). The case company operates in the mobile technology industry and specializes in software development. The core individuals involved for this collaboration are the company's founder (as the Chief Executive Officer or CEO) and myself (as the Service Designer). The case company's primary offering is a software that improves the process of building early-stage mobile applications (apps). The software offered by the case company is recognized as an app-building tool. The tool is

designed to function as an add-on. In software development, an **add-on** is known as an addition or extension to an already existing, larger computing program. Add-ons enable users to access additional functions and features that the original computing program typically does not. The add-on that was developed by the case company was specifically designed and developed to extend features of Photoshop by Adobe Systems. The main function of this add-on is to assist Photoshop users with the development of their own software and mobile apps. In other words, the case company offers a tool for other software developers to use. Other software developers can use the add-on (with Photoshop) to design, build and test early-stage prototypes of apps.

2.0



Research Framework and Design

2.1 Relevant Terms and Literature

This section contains a series of frequently used terms that are directly related to the theoretical structure and design of this thesis. For the intentions of this thesis, relevant terms and literature have been identified and are considered common within the scope of the research. The key terms in this section are common in practical service design and software development.

2.1.1 Service Design

Foremost, visuals throughout this thesis are an important element and serve as an example of practical service design. One of the main efforts in practicing service design is to incorporate strong visualizations to explain complex ideas (Mayou G. 2017).

The task of defining service design has perplexed experts across the field. Several experts have defined and re-defined this term. As a result, a general definition has been proven difficult to extract. One particular example that supports the ambiguity connected to defining *service design* states that, "...if you ask 10 people what service design is, you will get 11 different answers" (Kerymova 2014). The following table displays some of the most common explanations of service design from leading experts, practitioners and global organizations (see Table 1):

Varying definitions of <i>Service Design</i> from leading experts, practitioners & organizations	
Source	Description
Accenture Fjord consultant agency	<p>Service design is a customer-centric, co-creative and holistic approach to problem solving. It is a combination of design thinking, design doing and design culture. Fjord also uses a 'coffee shop' example to explain service design. On April 4th 2017, Fjord released a short video to explain their interpretation of service design. The content in the video was based on Marc Fonteijn's 'coffee shop' example:</p> <p><i>"If there are x2 coffee shops side-by-side and they are selling the same coffee for the exact same price, service design is the reason that you go into one coffee shop and not the other."</i></p> <p>The production of the video itself serves as an example of what service design is intended to do (Fjord 2017).</p>

Table 1: Varying definitions of service design from leading experts, practitioners & organizations.

Table 1 (continued)

Varying definitions of <i>Service Design</i> from leading experts, practitioners & organizations	
Evert Gummesson (2006) Emeritus Professor (marketing thinker)	“Service design is the creation or development of services based on design, user-oriented research, analyses and company business. It is the identification of the users’ needs, the stakeholders, context, relations, affinities and interactions between services and users while aiming to reach user satisfaction and engagement” (Gummesson 2006)
Stefan Moritz (2005)	“Service Design helps to innovate (create new) or improve (existing) services to make more useful, usable, desirable for clients and efficient as well as effective for organizations. It is a new holistic, multidisciplinary, integrative field” p. 39
Design Council Charity Organization (strategic design)	“Service design arose around 2000, with a handful of agencies that effectively created their own demand. Often founded by former web and interaction designers, they discovered a receptive clientele among both corporate clients and local authorities looking to create innovative services” (Design Council 2013, 41). Service design is a design discipline that utilizes creative problem solving and holistic methods to develop services. “Services are innovatively developed in cooperation with all the stakeholders involved.” Design council also explains that Human-centered service design is this same discipline, only the focus is on the customer in the center of the development (Design Council, 2013)
Other comprehensive works relevant to understanding service design in-depth	
*Grönroos, C., 2007	Title: “ <i>Service Management and Marketing: Customer Management in Service Competition</i> Grönroos developed a market-oriented management approach and shows how the competitive advantage of a company can be built upon customer relationships” (as cited by Vita 2014).
*Maglio, P., Kieliszewski, C. & Spohrer, J., 2010	Title: “ <i>The Handbook of Service Science</i> Maglio, Kieliszewski & Spohrer explain serves as an extensive reference that is suitable researchers in practice and academia who aspire to create a deeper scientific basis for: <ul style="list-style-type: none"> • service design & engineering • service experience & marketing • service management & innovation” (as cited by Vita 2014).
Prahalad, C.K. & Ramaswamy, V., 2004:	Title: <i>The Future of Competition, Co-Creating Unique Value with Customers</i> Prahalad & Ramaswamy explain how evolving an organization’s offering and tailoring the way customers interact with it based on the customers’ desires can be done at the level of the individual customer rather than customers in the aggregate and how this will help the company co-create.
Moritz, S., 2005: Köln International School of Design.	Title: “ <i>Service Design, Practical Access to Evolving Field</i> Stefan Moritz describes service design as a way for practitioners to deliver value. He also offers an insight to service design and some of the disciplines that are connected. His work gives practical viewpoints to service design, the process, some methods and well-known tools.”
*Miettinen, S. & Koivisto, M., 2009: Kuopio Academy of Design & University of Art and Design Helsinki	Title: <i>Designing Services with Innovative Methods</i> “This book also presents an overview about service design and how to benefit from applying such methods and tools in order to understand customers and develop better products and services” (as cited by Vita 2014).

*indicates as cited by Vita, J. C. 2014

Table 1 (continued): Varying definitions of service design from leading experts, practitioners & organizations.

Based on the combination of definitions sourced from service design oriented forums, expert opinions, academic research and first-hand experiences, it is most practical at minimum, to say that service design is a practice. It is further understood that service design is the practice of a strategic and innovative approach to foster a symbiotic relationship between the providers and recipients of value. The technique in which the relationship is built and maintained is best exemplified through the ideologies of design thinking, co-creation and empathetic aptitude.

2.1.2 Service Dominant Logic

The service-dominant logic (SDL) explained by Evert Gummesson suggests service (in the singular) as the core concept replacing both goods and services. A supplier offers a value proposition, but value actualization occurs in the usage and consumption process. Thus value is the outcome of co-creation between suppliers and customers (Gummesson, E. 2002; as cited by Lusch, R. & Vargo, S. 2004, 11). SDL is a core mode of thinking throughout this thesis. Gummesson provides a detailed description of the logic behind of goods-dominant and services-dominant (see Table 2).

Logic of the Goods- and Service-Centered Views (Gummesson, 2002)		
	Goods-Centered Dominant Logic	Service-Centered Dominant Logic
Primary unit of exchange	People exchange for goods. These goods serve primarily as <i>operand resources</i> .	People exchange to acquire the benefits of specialized competences (knowledge and skills), or services. Knowledge and skills are operand resources.
Role of goods	Goods are operand resources and end products. Marketers take matter and change its form, place, time, and possession.	Goods are transmitters of operand resources (embedded knowledge): they are intermediate “products” that are used by other operand resources (customers) as appliances in the value-creation process
Role of customer	The customer is the recipient of goods. Marketers do things to customers; they segment them, penetrate them, distribute to them, and promote to them. The customer is an operand resource.	The customer is a co-producer of service. Marketing is a process of doing things in interaction with the customer. The customer is primarily an operand resource, only functioning occasionally as an operand resource.

Table 2: Gummesson’s Explanation for Logic of the Goods- and Service-Centered Views.

Table 2 (continued):

	Goods-Centered Dominant Logic	Service-Centered Dominant Logic
Determination and meaning of value	Value is determined by the producer. It is embedded in the operand resource (goods) and is defined in terms of “exchange-value.”	Value is perceived and determined by the consumer on the basis of “value in use.” Value results from the beneficial application of operand resources sometimes transmitted through operand resources. Firms can only make value propositions.
Firm-customer interaction	The customer is an operand resource. Customers are acted on to create transactions with resources.	The customer is primarily an operand resource. Customers are active participants in relational exchanges and co-production.
Source of economic growth	Wealth is obtained from surplus tangible resources and goods. Wealth consists of owning, controlling, and producing operand resources.	Wealth is obtained through the application and exchange of specialized knowledge and skills. It represents the right to the future use of operand resources.

Table 2 (continued): Gummesson’s Explanation for Logic of the Goods- and Service-Centered Views.

2.1.3 Design Thinking



Picture 1: Design Thinking Workshop (M. Rancourt of The New School at TNW Amsterdam Conference, 2016).

“Design thinking connects the design function to the business purpose” (Rancourt, M. 2016; see Picture 1). Moritz (2005) explains that service design is not a new specialized design discipline. “It is a new multidisciplinary platform of expertise that was born from design thinking (Moritz, S. 2005). Design thinking is yet, another construct that upholds a wide range of interpretations. Fitting explanations for design thinking have been translated from Finnish and paraphrased by Mari Lounavaara (2016) as the following: “**Design thinking** is an

important way of thinking and a tool for a service designers. Design thinking emphasizes the ability to build empathy from for others and note the details that others would miss through close inspection of sources for innovation. Design thinking is about humanity and human centricity. The utilization of user information enables innovation to be part of the design behind services and solutions. It is additionally explained that one does not need to be a designer to embrace design thinking. Design thinking is a tool for anyone solving problems” (Tuulaniemi 2011; Newman 2006; Miettinen 2011; Brown 2009: as cited by Lounavaara, M. 2016, 17).

2.1.4 Redesign Thinking

Redesign thinking is an important way of thinking used throughout this thesis. Redesign thinking is the combination of the values behind design thinking and the process of redesign. Redesign is an often neglected phase of the design process and considered to be a major challenge for designers (Edelman, J., Agarwal, A., Paterson, C. & Mark, S. 2014, 32). Combining the act of redesign with the mind-set of design thinking, service design can be practiced from a sound platform for achieving excellence. Redesign thinking is an important mode of thinking throughout this thesis.

2.1.5 Empathic Aptitude

The aptitude or capacity at which empathy can be cultivated, possessed, understood and utilized for strategic development is central to co-creating value. The ability to possess, understand and utilize empathy is a core component of user-centric service design. Empathy is a construct that has been examined by an innumerable amount of experts in the fields of psychology, philosophy and neuroscience since the early 1900’s. Edward B. Titchener’s 1909 translation of the German word *Einfühlung* is what many know today as the term *empathy*. Although difficult to define and measure, empathy has been acknowledged and widely accepted as a construct that involves a person’s ability to experience the feelings, emotions and internal state of another person (Batson, D. C. 2011, 4–8 ; Barker 2003, 141: as cited by Gerdes, K. E. & Segal, E. A. 2009, 114). Gerdes & Segal (2009) further explain that empathy is a subtle, complicated and fleeting process that is not easily articulated. Occurrences of empathy are best explained by Daniel Batson’s (2011) eight related but distinct occurrences of empathy (see Table 3).

Batson's (2011) Eight Occurrences that Explain Empathy	
Concept 1	Empathy occurs as knowing another person's internal state, including his or her thoughts and feelings.
Concept 2	Empathy occurs when one person adopts the posture or matches the neural response of an observed other.
Concept 3	Empathy occurs as coming to feel as another person feels. Batson (2011) explains that this has been a "dictionary definition" of empathy and has been widely accepted by several philosophers, neuroscientists and psychologists. Some experts claim that this is not only "emotion matching" but it is also "emotion catching".
Concept 4	Empathy occurs by intuiting or projecting oneself into another's situation.
Concept 5	Empathy occurs when imagining how another is thinking and feeling.
Concept 6	Empathy occurs when imagining how one would think and feel in the other's place
Concept 7	Empathy occurs by feeling distress from witnessing another person's suffering
Concept 8	Empathy occurs by feeling for another person who is suffering is explained as empathic concern (for example, feeling sad or sorry for your friend that is feeling scared or upset).

Table 3: Eight Occurrences that Explain Empathy (Batson, 2011).

To achieve a high empathic aptitude, immersive methods of user studies were conducted. Empathy is an important element to understanding human interaction and plays a major role in the framework of this thesis.

2.1.6 Co-creation of Value

The co-creation of value is comprised of two parts: co-creation and customer value. Customer value is determined by the beneficiary or recipient. Lusch (2007) explains that value includes two parts: the value in exchange (i.e. monetary price) and the value-in-use. In this case, software application developers are the target recipients that determine value. Co-creation, in this thesis, refers to innovative methods of service improvement. Co-creation is an action between providers and recipients to enrich the service function and highlight complexities in relation to the many involved (Gummesson & Polesse 2009; as cited by Quero, M., J. & Ventura, R. 2013, 124). Co-creation is primarily used in the process of meaningful development. Co-creation of value suggests that customer value is not created by a single cause. Instead, value is co-created by customers, users and all partners in the value network. The organization must include the perspectives of a variety of stakeholders and examine the network between them to achieve co-created value. (Guercini, S., & Fanfagnì, S. 2013, 162–165; Lusch 2007: as cited by Quero 2013, 124). This is a central component of service design and service dominant logic.

2.1.7 Content Consumption

In this thesis, content consumers refer to anyone or organization that acquires content for the purpose of further development. For example, if an app development company acquires graphic designs or digital works and uses them in an app being developed, then the company that is developing the app would be consuming content. Content consumption is typically exercised by content curators, especially in terms of digital contents

2.1.8 Content Creation

In this thesis, content creators refer to anyone that contributes information or their efforts to produce content. Content can include (but are not limited to) digital and non-digital works like: illustrations, graphics, designs, sounds, small software programs, lines of code, lines of prose, short stories, poetry or any other created constructs.

2.1.9 User-Centric Design

The suffix *-centric design* indicates a viewpoint, whereas the prefix of the term indicates the discipline in which the design process is for. It is noteworthy to mention that the term *user* has a dual disciplinary definition. For the congruency of this thesis, the term *user* is relatable to the field of technology, interaction and information. A *user*, in other words, is considered to be an individual whose interactivity is vital to the exchange of product or service. User-centric design is a viewpoint of a design process that is common in the technology industry. The notion of user-centricity supports that the user is the primary focal point of product or service development. This definition is an interpretation of varying terms commonly related to user-centricity by design (see Table 4). Other terms include prefixes like, *human-*, *person-*, *customer-*, *client-*, *consumer-* and *recipient-* just to name a few.

Varying terminology for user-centricity (design)		
Source	Term	Description
Brusberg (2003)	User-Centered	*UCD aims to expand the designers' knowledge, understanding and empathy of users.
Black (2006)	User-centered	User-centered designers engage actively with end-users to gather insights that drive design from the earliest stages of product and service development, right through the design process.
IDEO	Human-centered	Human factors: <ul style="list-style-type: none"> - Applying human factors & techniques to people across the ecosystem, not just end users / consumers. - Putting people at the heart of the process; - Making things "useful, usable and desirable" for people.
Jordan (2000)	Person-Centered	*To take a wider view of person-centered design and look, in a more holistic context, both at product use and at those using and experiencing products.

Table 4: Varying Terminology for User-centricity (design).

*indicates as cited by Zhang, T., & Dong, H., 2008.

Table 4 continued:

Varying terminology for user-centricity (design)		
Source	Term	Description
Norman, D. (2002)	User-Centered	*A philosophy based on the needs and interests of the user, with an emphasis on making products usable and understandable (2002)
McDonagh-Philp & Lebbon (2002)	User-Centered	*A design methodology utilizing users as a designing resource, to increase the involvement of the user.
New York State Office of Mental Health (2014)	Recipient-Centered	Recipient-centered care reflects the significance of individualized transparent-treatment. This term was derived from a survey given to people receiving treatment for mental illness. The survey indicated that the term “recipient” was a preferred title.
Walters (2005)	Human-Centered	*A creative exploration of human needs, knowledge and experience which aims to extend human capabilities and improve quality of life.

Table 4 continued: Varying Terminology for User-centricity (design).

*indicates as cited by Zhang, T., & Dong, H., 2008.

2.1.10 User Experience (UX)

For the interests of this thesis, user experience is a focus on the total experience of users. Even though the viewpoint of UX has gained an increasingly strong connection to the digital industry, the term *user experience* encompasses the experiences of users both on-screen and off-screen.

2.1.11 Start-up Ecosystem

The term *Start-up* has been branded with several interpretations of its definition. The Merriam-Webster dictionary indicates that start-up means “the act or an instance of setting in operation or motion” or “a fledgling business enterprise.” The American Heritage Dictionary suggests it is “a business or undertaking that has recently begun operation.” The term *Start-up* has been used to describe a wide range of components common in starting a business. The most fitting definition for the interests this thesis describes start-up “as a

culture and mentality of innovating on existing ideas to solve critical pain points” (Robehmed 2013).

The ecosystem in which a start-up company functions has been well-defined by Valto Loikkanen (2016). Loikkanen explains that the start-up ecosystem is an area between an entrepreneurial ecosystem and an innovation ecosystem (see Figure 1).

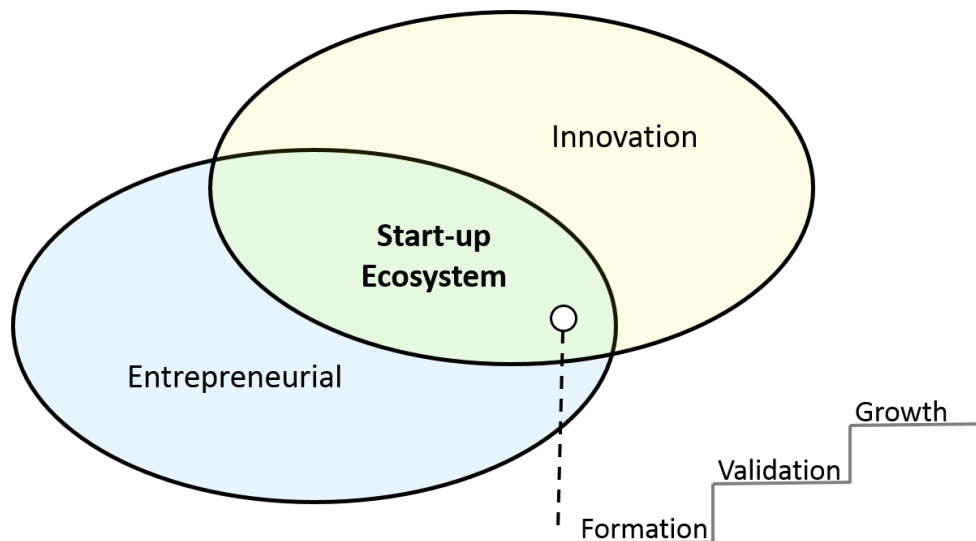


Figure 1: Start-up Venn diagram with Phases (Loikkanen, 2016).

Loikkanen (2016) continues to explain that there are support phases within the start-up ecosystem. The phases occur in a sequence from formation to validation, then growth. The growth phase is a main focus throughout this thesis. According to Loikkanen (2016), early stages of start-up growth require knowledge as a main resource. Later stages of start-up growth requires other resources like networks and business relations for scaling. Because resources are limited in the early stages of start-up growth, it is a main objective to utilize service design as a means to maximize resources like knowledge and information.

2.1.12 Design Process

The design process is an important component to practicing service design. It is not uncommon to find multiple models and design processes that have been adapted to a particular organization or task. It is also not uncommon to find varying models in the same

discipline with significantly different phases. The process of service development is often denoted in stages and development teams move through stages that range from recognizing needs to implementing solutions. Design experts in both practice and academia have generated a variety of design process models. There is an innumerable amount of models that represent the process of design. Designers offer their own interpretations and adapt design processes at an individual level. It would not be realistic to list the numerous processes of design. Therefore, the following section includes only a few of the more well-known models:

Interactive Process of Design is explained by Marc Stickdorn and Jakob Schneider (2011). This particular process is described as an “interactive process of service design thinking.” According to Stickdorn and Schneider (2011), the interactive process of design includes 4 stages (Exploration, Creation, Reflection and Implementation). The following is a paraphrased description of each stage (Stickdorn, M. & Schneider, J. 2011, 122–135)

The **exploration** stage is best described as a discovery stage. The main objective in this stage is to understand the goals of the service provider. Stickdorn and Schneider (2011) explain that it is important to understand what the provider expects from providing the service. Reviewing the design process with the company providing the service is an example of a method used in exploration stage. Another activity typical to this stage would be to focus a viewpoint from the company’s perspective and then switch the focus to understanding the same problems from the customer perspective. Viewpoints from both parties are significant and can be understood by collecting information or in other words, exploring. The **creation** stage is focused on the concept (namely, the design of the concept). The creation stage is based on the findings from the previous exploration stage. This is the stage where idea generation occurs, mistakes are made and learning happens. The **reflection** stage includes prototyping. Developing and testing occurs in an environment that is as realistic as possible. Realist testing can promote emotional involvement and procure the emotional aspects of the service. The **implementation** stage is a stage of action. This stage supports the involvement of all individuals and groups connected to delivering the service. Trainings often occur here to fabricate and facilitate a final delivery of the end-goal.

Double Diamond Design Process is a process of design has been significantly influential to the design process of this thesis. The Double Diamond Design Process (Figure 2) was developed by in-house researchers of the (British) Design Council in 2005. (Design Council 2005, 6). Researchers from the Design Council conducted a study known as the *Eleven*

Lessons Study and revealed Double Diamond diagram as a result (Design Council 2005, 6). Researchers met with experts from the design departments of x11 leading global-brands: Alessi, BSKyB, BT, LEGO, Microsoft, Sony, Starbucks, Virgin Atlantic Airways, Whirlpool, Xerox and Yahoo!. In their report, the Design Council (2005) explained that, “different designers manage the process of design in different ways. But when we [researchers at Design Council] studied the design process in eleven leading companies, we [researchers at Design Council] found striking similarities and shared approaches among the designers” (Design Council 2005, 6–7).

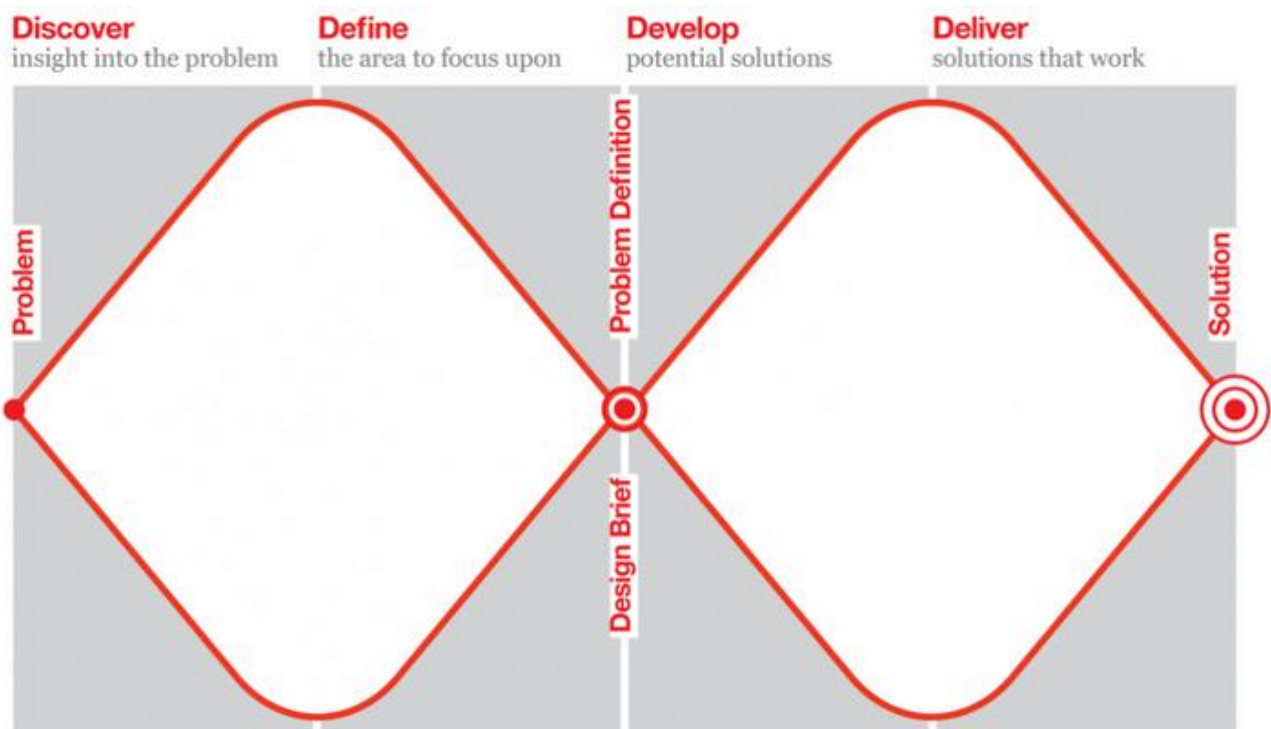


Figure 2: Double Diamond Design Process by Design Council (2005).

The similarities between the eleven companies (in 2005) were combined to form the core phases of the design process known as the Double Diamond. The core phases are explicated by the Design Council to be divided into x4 distinct sections: discover, define, develop and deliver. The section and phases are further explained by the Design Council (2005) as the following:

The first quarter-phase (1/4) is to **discover**. It is explained that the first section of the Double Diamond model marks the start of the project. The process begins with an initial idea or inspiration that is often sourced from a discovery phase. In the discovery phase, the users’ needs are identified. The second quarter-phase (2/4) is to **define**. It is explained that the second section is a filtering phase. This phase is where reviewing, selecting and discarding

ideas takes place. In the *Eleven Lessons Study* (Design Council, 2005), it was noted that the participating design departments performed “strikingly similar” tasks in this phase. However, each company identified this phase differently. For example, Microsoft called this the *Ideate* phase. Starbucks has named it *Downtown* and Whirlpool referred to it as *Synthesis*. The third quarter-phase (3/4) is to **develop**. This section of the Double Diamond model indicates that the project be been taken through a formal sign-off.

It is explained that financial and corporate support have authorized the development of one or more concept(s). The final quarter-phase (4/4) is to **deliver**. This phase explains that the end-concept continues through final testing, sign-off, production and launch. The final stage of the process is designed to identify any final constraints or problems before manufacturing occurs. The product or service is checked against standards, regulations, damage tests and compatibility tests.

Human-Centered Design Model or HCD by IDEO (2011; see Figure 3) was the second influential process of design in this thesis. This model depicts x3 specific phases with converging and diverging interactions between them. The stages include inspiration, ideation and implementation.

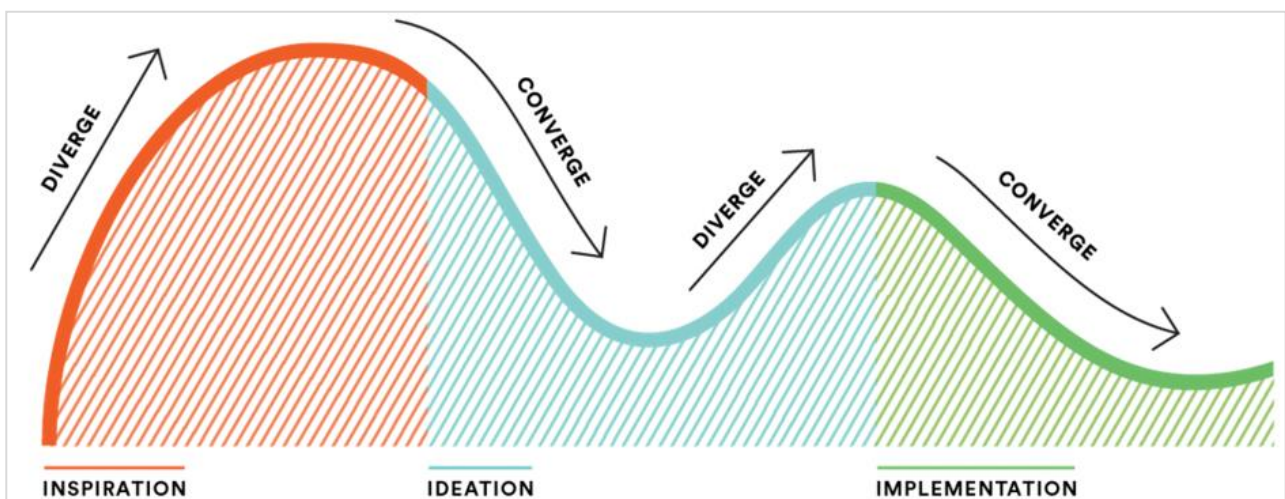


Figure 3. Human-Centered Design Model by IDEO, 2011; direct from IDEO.org (2017).

The inspiration phase is described as the phase of learning by doing. IDEO explains this as “learn on the fly” with the grounding thought of the user as the means of motivation. The ideation phase aims to collect and refine ideas in the same process. The implementation phase is focused towards generating prototypes. IDEO emphasizes the importance of

learning by doing and adapting solutions with the desired outcome being that the users embrace solutions, rather than resist. IDEO's HCD model depicts diverging and converging sections (similar to the Double Diamond). This is an important detail in the adapted design process of this thesis. The diverging motion represents the expansion or broadening of awareness whereas, the converging motion represents the refining of information.

2.1.13 Ambiguity between Knowns and Unknowns

The combination of knowns and unknowns has been the basis for some of the most influential experiments in risk-probability to date. Daniel Ellsberg (1961) conducted an experiment that explored the effects of ambiguity and people's understanding of uncertainty. This study has become known as the *Ellsberg Paradox*; it has been fundamental in the philosophical analysis of certainty, uncertainty and the ambiguity between them.

In a conclusion of the work by Lobna Okashah and Paul Goldwater (1994), "it is necessary to model unknown unknowns in simulation, for they represent occurrences of the real world." Okashah, L., & Goldwater also claim that unknown unknowns are rare and they often have dramatic and expensive effects. In practice, few models include this phenomena and this area of research should continue to be investigated (Okashah, L., & Goldwater, P., 1994, 694). A notable piece of research following Ellsberg (1961), Okashah and Paul (1994), was the work of Francesco Nuzzaci (1998). To paraphrase Nuzzaci's ideology, people should face change and uncertainties with a greater calmness and without any philosophic or scientific panic. Nuzzaci (1998) continued to explain that, "it is not necessary to take the road that leads to skepticism, irrationalism, or nihilism." Instead, efforts are better focused on understanding the nature of (un)certainities. It is through the understanding of these certainties and uncertainties that we gain "a more fruitful forms of knowledge" that can lead to healthy modification (Nuzzaci, F., 1998, 119).

This philosophy has become well-known and widely accepted by some of the leading experts on a multidisciplinary platform. For example, in physics, the (un)certainities of Galileo regarding an *ex nihilo* universe or the writings of Newton to prove a helio-centric solar system. Quantum physics alone is an examination of the principle of uncertainties. It is, without a doubt, that the encounter with uncertainty is unavoidable and found in almost every discipline (for example, medicine, biology, micro-biology, astrophysics, quantum physics, organic chemistry, psychology and design). In 2002, this philosophy also surfaced on the political platform.

Donald Rumsfeld (US Secretary of Defense, 2002) popularized the dimensions of (un)certainty in a speech that he made during a press conference at the North Atlantic Treaty Organization (NATO) Headquarters in Brussels:

“...There are things we know that we know. There are known unknowns. That is to say there are things that we now know we don't know. But there are also unknown unknowns. There are things we don't know we don't know. So when we do the best we can and we pull all this information together, and we then say well that's basically what we see as the situation, that is really only the known knowns and the known unknowns...”(Rumsfeld, 2002).

Slavoj Žižek (psychoanalyst and philosopher, 2015) further explains known knowns, known unknowns, unknown knowns and unknown unknowns. This analysis is best represented in a Punnett Square of knowns and unknowns (see Figure 4):

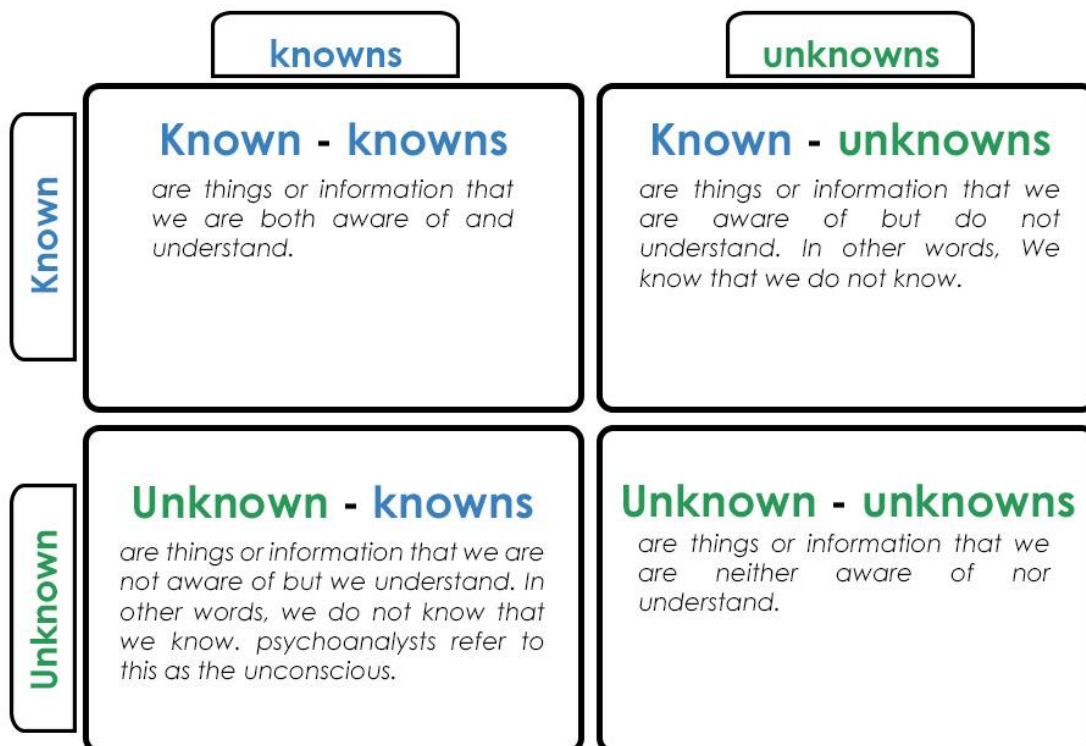


Figure 4: Punnett's Square of Knowns versus Unknowns (2015).

Known knowns refer to things that we are aware of and understand. For example, we know that Adobe Photoshop is required in order to utilize the case company's software. The case company's software is an add-on for Adobe Photoshop. In other words, Photoshop must exist and function in order for the add-on software to work. This is a known and understood certainty. **Known unknowns** refer to things that we are aware of, but do not understand. For example, we know that we do not know what the actual intent of a user would be. In other words, we are not totally certain about what a user is going to use Photoshop for. A user might be creating visual designs or even reverse programming the software to create a totally new software. It is not possible to know the actual intent, but we are well-aware that we do not know this information. We can make informed assumptions or even ask the users. However, since there is a possibility that a user could tell a lie, the level of awareness remains certain while understanding the actual intent remains ambiguous. **Unknown knowns** refer to things that we are not aware of, but we can understand. This is knowledge about an uncertainty that we inherently know. These [unknown knowns] are a part of our identity and determine our activity, but we are not aware that we know them. This is what psychoanalysts refer to as the unconscious. This is a subjective type of uncertainty and it is of my opinion that intuition (from a designer or behavioral expert) helps to clarify unknown knowns. **Unknown unknowns** refer to things that we are not aware of and do not understand. This is something totally unimaginable and completely unexpected (Rumsfeld 2002; Žižek, S. 2015).

2.2 Scope and Frame of Reference

The overall scope of this thesis is within the mobile-tech and start-up ecosystem. The target industry is software application development and the area of focus is utilizing service design as an agent for growth within the case company. The primary offering (by the case company) is a software add-on used as a tool for developing other software applications. Throughout this thesis, principles of service design include user-centric design, empathic design, design thinking, redesign thinking and co-creation. See Figure 5 for a visual frame of reference.

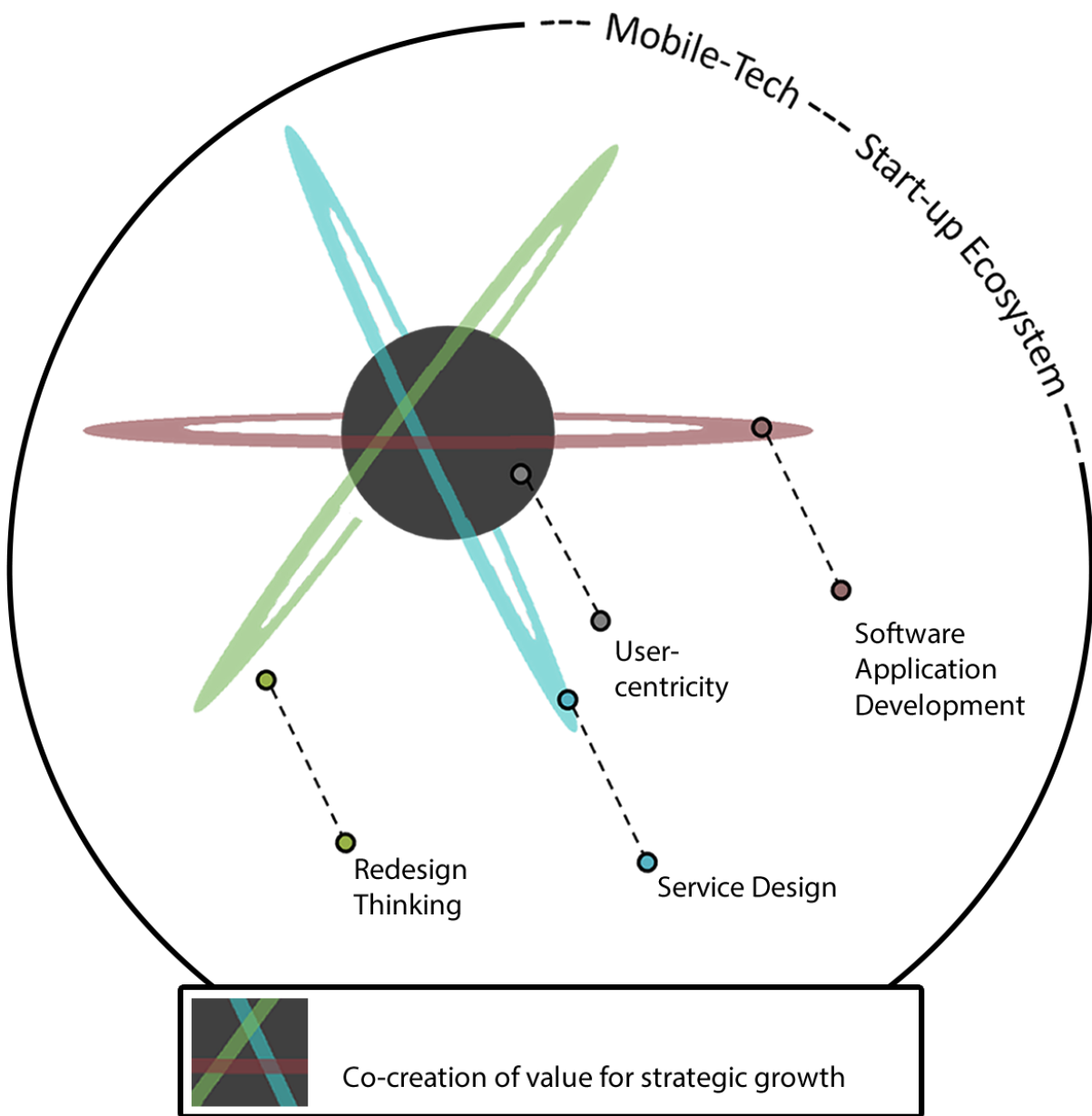


Figure 5: Visual Frame of Reference.

2.3 Purpose, Aim and Objectives

The grand purpose of this thesis is to offer theoretical and practical contributions to the field of service design. The motivating purpose of this thesis is to promote growth within a start-up company by applying service design strategies to develop a software as a service. It is intended to implement theories and methods related to service design in order to improve the overall relationship between the case company and target users. The most essential prerogative is to enhance users' total experience, thus, leading to growth within the case company. This research supports that service design strategies not only reveal disrupted conditions, but also offers highly viable (Hi-Vi) solutions in the form of service(s).

The aim of this research is to utilize principles of service design as an agent of growth within a start-up company. To focus the aim of this thesis, four main objectives are central throughout this research. The first objective is to collect true user insight. Methods of collecting user insight have been carefully selected and are heavily influenced by strategies in qualitative data collection (see Methods). The next objective is focused on analyzing information through an empathic perspective. Empathic analysis of user insight is critical to understanding problems and developing strategies for growth. The third objective is to foster the process of co-creating value. The last objective is to conceptualize highly viable (Hi-Vi) solutions in the form of service. An underlying theme throughout this thesis is to utilize a combination of skills in service design and behavioral studies to discover and understand unknown needs.

2.4 Research Questions

The original question that was proposed by the case company was, "*How can we [the case company] market low revenue content (i.e., \$1.00 - \$3.00)?*" It is important to mention that several months of research and benchmarking was conducted by the case company prior to introducing service design efforts. The original question served as a basis for further exploration through strategies in service design. To directly answer the original question, it was necessary to inquire and extract. In other words, ask more questions. A series of more precise questions followed and the simple reason for this is because more information was needed to answer the original question. The original question was ultimately focused on user behavior and the motivational questions that emerged were:

[1] What are the main influencing factors in the pricing of content?

[2] How can we enhance the relationship between content consumers and content creators?

Extensive benchmarking and user studies were co-conducted and notes were shared between the case company CEO and myself. The second research question emerged in the midst of conducting user studies. It was realized that there is a real disruptive condition within two prominent groups of specialists in software application development (see Results).

2.5 Methodological Overview and Theoretical Support

This section includes an overview of the methods used and theoretical support for the methods as common tools used in applied service design. Some methods are included from related fields like marketing. Other methods have been adapted from other fields like social sciences and psychology. The combination of these methods is supported by a multidisciplinary approach to collect information and develop a growth strategy for the case company. Table 5 displays the service design tools used as methods for information collection, analysis and conceptualization.

Methods of information collection (see Section 3.3)	
Method / Tool	Theoretical support & overview of use
User journey map (onboarding)	Customer journey maps provide vivid but structured visualization of a service (or part of a service in this case). The map indicates areas where the customer interacts with the service and connected components (Stickdorn & Schneider 2011, 80, 95; see Section 3.3, p. 43).
Ethnographic (desk) research	Ethnographic research is common social scientific method of data collection. This method is used to collect a significant amount of information about how a user typically performs/ behaves (see Section 3.3, p. 44). Desk research refers to secondary data collected from reviewing and monitoring web analytics.
Semi-structured user-views with probing	Personal experience as a behavioral specialist in a clinical setting supports this method as an objective approach to collect direct information with minimal influences and biases (see Section 3.3, p. 45).
Probing (interview technique)	Semi-structured interviews were supported by probing techniques (to gain a deeper understanding). Most probing questions encourage open response. Probing questions often begin with “how” or “what” and often avoid asking “why.” Previous and personal interviewing experiences has revealed that asking “why” often leads people to a closed or defensive mental state. Whereas, asking “how” or “what” can entice people to feel empowered and be more willing to explain (see Section 3.3, p. 45).
Persona Building	“Personas are used as vehicles for introducing a user perceptive and adds input from a wide selection of user-centric methods” (Stickdorn & Schneider 2011, 84; Curedale, R. 2013, 218; see Section 3.3, p. 46).

Table 5: Methodological Overview

Table 5 (continued)

Method / Tool	Theoretical support & overview of use
Archotyping	This is an extension to persona building. However, unlike personas, archetypes are generated using real-time data from sources like web analytics, demographics from actual interviews and user interaction (see Section 3.3, p. 46).
Thinking aloud	Thinking aloud is a popular method in cognitive behavioral therapy and it is used to reinforce an action or a non-action. This method is also used to bring attention to the thought process of a participant at a specific period of time (Curedale, R. 2013, 244; see Section 3.3, p. 47).
Method / Tool	Theoretical support & overview of use
Direct supportive observations (one-to-one)	Personal experience as a behavioral specialist in a clinical setting supports this method as an objective approach to collect direct information with minimal influences and biases (see Section 3.3, p. 47).
Comprehensive user study	Combined methods were used to directly observe, probe, encourage thinking aloud protocol and follow up with unstructured interviews. See appendix 1(1–5).
Methods of analysis (see Section 3.4)	
Method / Tool	Theoretical support & overview of use
Empathic overviewing	Empathy is a frequently mentioned construct in nearly all credible literature in the field of service design (Batson, D. C. 2011; Curedale, R. 2013, 100; Design Council 2015; Fjord 2017, Gerdes, K. E. & Segal, E. A. 2009; Gummesson, E. 2006; Lith, J. 2015; Matto, H., et. al. 2013; Mayou, G. 2017; Stickdorn, M., & Schneider, J. 2011).
Methods of conceptualization (see Section 3.5)	
Method / Tool	Theoretical support & overview of use
Visualization	To make intangible and complex concepts visible. Visualization helps to envision future ideas by visually illustrating how it would work (Moritz 2005, 92; Stickdorn, M., & Schneider, J. 2011). In this thesis, visualization is a critical component to implementing the practice of service design. Visualization is also used to provide a better understanding of concepts within this thesis.
Full-text design documentation	Full text proof of concept design documents were written and shared with the case company CEO. See Appendix 2(1–4).
Business model canvassing (as a concept)	The business model canvas (BMC) is described as a match between business strategy and service design. The BMC is a tool for describing, analyzing and designing business models. Using this method adds clarity, identifies potential strengths/ weaknesses and provides a general feel for how a business model would function (Stickdorn & Schneider 2011, 129; see Section 3.5, p. 50).
Parallel business Model comparison with abridged blueprint (as a concept)	Benchmarking and comparing company strategies to others in the field is common knowledge shared in most business practice. This method was used as a visualization to demonstrate how a new service concept could work. Blueprints are the standard method to illustrate service processes and evidences (Stickdorn & Schneider 2011, 80, 125). Blueprinting is the mapping of a service journey by identifying the processes that makes up the service. It isolates possible fail points and establishes the duration of various stages of the journey (Moritz 2005, 89; Curedale, R. 2013, 96).

Table 5: Methodological Overview (continued).

2.6 Limitations

Desynchronized agile development has a major influence on the growth and development of the case company. Even though the case company and the parent company utilize similar agile methods of software development, the timing of updates and releases is not well-known. Adobe has a track record of developing in an agile process. Even though it is not officially stated in plain text, it is easy to see that Adobe Systems Inc. makes several updates in rapid session that are not easy to predict. See Appendix 3 for version specific release notes by Adobe Creative Cloud between the years 2013–2016. Activity in Appendix 3 shows only a small fraction of the amount of updates that Adobe Systems releases without prior announcement. It can be deduced that agile methods are used in releasing this amount of developments. As a result, the case company has boundaries of development that cannot be changed at this time. Major updates (with advanced announcements) can also set boundaries on the development and growth of the case company. For example, one of the latest and major service modification in Adobe Systems was the shift from SaaS to SaaS. This transition is known as Adobe Creative Cloud (CC). The Creative Cloud is a software that functions as a service (SaaS) and Adobe integrated the Creative Cloud with Photoshop to deliver a Photoshop CC experience (SaaS platform). As a result, any potential users and current that are unhappy with Adobe will unlikely become case company users. This limiting factor significantly impacts the population size and target user.

2.7 Delimitations

Observation without the knowledge of the participant was not performed. Most of the observation activity occurred within participants' place of work or at home. It is highly unethical to observe participants at their home or place of work without consent. All observations were conducted as supportive and with verbal consent.

Service blueprints were not prepared. The reason for this was the undetermined identification of the software as a service (SaaS) or as a product (SaaS). Identifying and blueprinting SaaS and SaaS would have required more time and multidisciplinary collaboration with SaaS/P experts. However, an abridged blueprint as was generated as a visual to support a potential business model (see Appendix 5). Drafting detailed service blueprints of the AppTender concept would have been the next step in development.

User experience design in relation to user interface design (in other words, UX/UI) was not performed. This is a common misinterpretation of service design practice to include UX/UI design. The reality is that UX is not UI. Therefore, total user experience (including off-screen experience) was the main focus. User interface design does not fit in the scope of this thesis. UI design would be beneficial in future works.

Key performance indicators (KPIs) were not set. Measuring growth specific KPIs interfered with performing unbiased observations. The ability to observe and report without being influenced is in good practice for designing service. It was also determined that there were too many extraneous variables influencing known causes of actual growth. Because the case company is in early stages of start-up, it was not feasible to focus on any single KPI as a cause for growth. In addition, there was not a viable way to separate the effects of service design from previous performances by the case company. With more time, service design KPIs would be beneficial to establish.

A decorative background featuring a black line graph with five circular nodes. The graph starts with a horizontal line, then drops at an angle, and then continues horizontally. Below the graph are several overlapping, semi-transparent gray diamond shapes. The text '3.0' is positioned in the upper right area.

3.0

Applied Methods

3.1 Designing a Design Process

After understanding how the Double Diamond design process was formed and when to use it, it became clear that this model was a significant support to product-centric design principles. In other words, the Double Diamond supports product-dominant logic and the original model is well-suited for moving a product-centric project through the phases of design. During the development of this thesis, it was realized that the Double Diamond model, alone, would not be substantial to support the process of user-centric service design for a software (as a service or SaaS). To emphasize the focus of this thesis and include the user as a central part of design, it was necessary to complement the Double Diamond model with the Human-Centered Design model (see Figure 6).

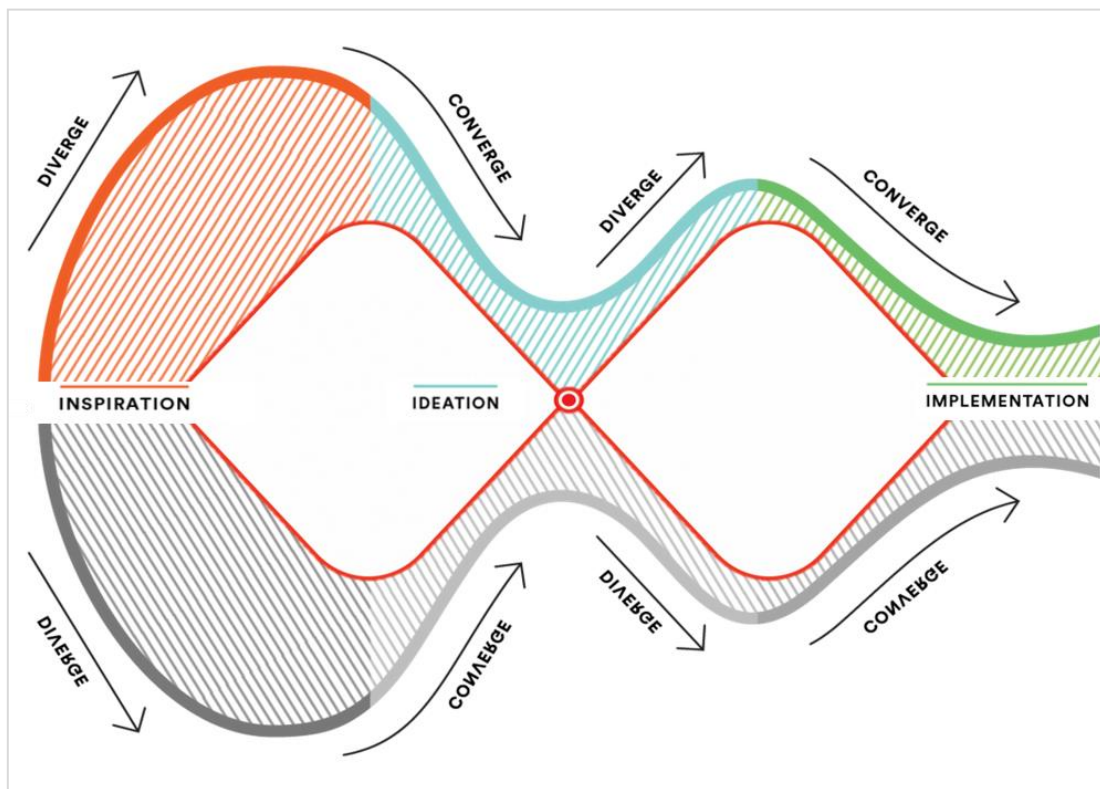


Figure 6: Merged Double Diamond Model with HCD Model.

Surface research through common Internet search engines revealed that dozens of different adaptations of the Double Diamond model exist. Many specialists that practice service design have analyzed the IDEO and Design Council approach.

Both of these models are linear types of design and an overwhelming majority of the adaptations follow the same linear structure. In the opinions of other specialists, including myself, it is necessary to form an adapted model that is unique and custom-tailored to fit needs. Merging Double Diamond with Human-Centered Design (see Figure 6) was the basis for developing a new design process (specific to this thesis). Merging these two models together helped to gain a new view for the design process used throughout this thesis. By mirroring IDEO's design process and superimposing Design Council's model, a redesign helps to understand that the core of most well-known models support the linear design process. The outcome of merging these two models has also helped to emphasize the importance of non-linear design.

3.1.1 Linear and Non-linear Process of Design

To better understand the process of design, it is necessary to mention the notion that a design process can be linear or non-linear. Linear movement can be thought of as movement along a linear plane or on a line. A linear design process moves forward in a sequence of stage (for example, film editing prior to 1990's). The above mentioned design processes are recognized as linear design. However, non-linear design indicates that the process of design does not progress in sequential micro-phases. Non-linear design supports the notion that the process of design sometimes has no clear direction. This is not to say that non-linear design is improvisation. It is to say that the stages are all well-known and carefully understood, but the direction or next course of action can occur outside the normal sequence. There is, of course, an end-goal but the objectives to achieve the end-goal are not aligned in sequence. Non-linear design often includes back-tracking, side-stepping and circular progression. It was through non-linear design that the Diminishing Double Diamond design process was designed (by the author of this thesis).

3.2 Development of Diminishing Double Diamond

The Diminishing Double Diamond (see Figure 7) is a conceptual design process that was developed in the writing of this thesis. This design process was developed and used as the as the primary design process for the remainder of this thesis.

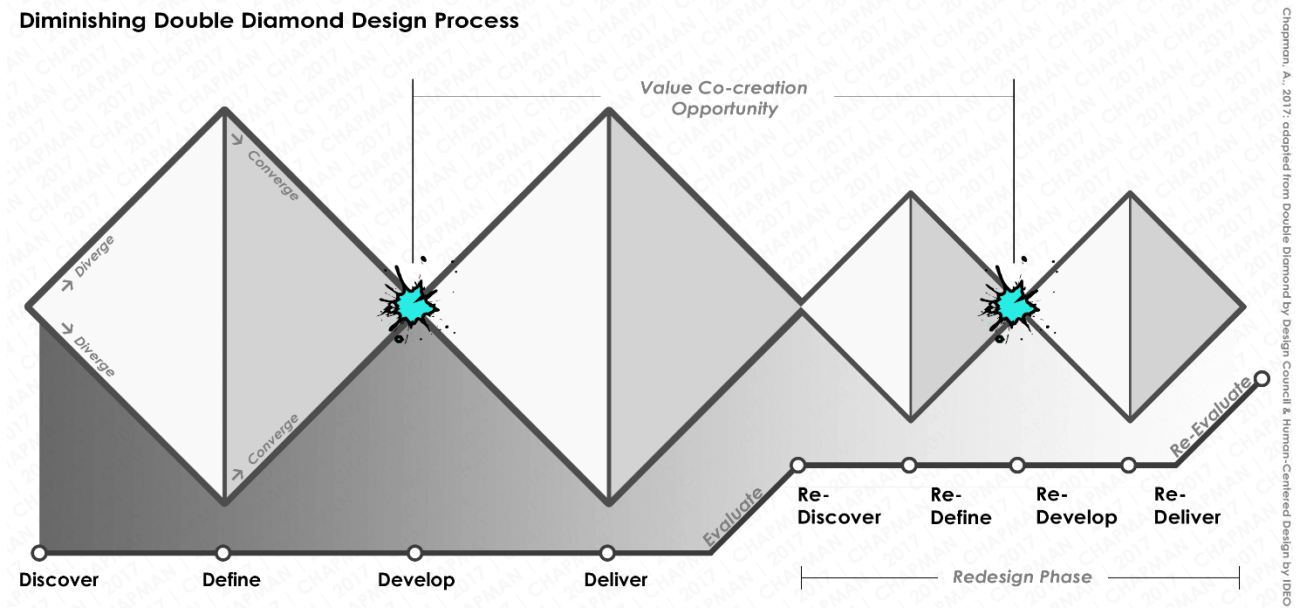


Figure 7: Diminishing Double Diamond Design Process.

The rationale behind the developing this model was based on the need to implement non-linear thinking to the process of designing services (for SaaS in app development). This process is still linear, but adding an emphasis on the redesign phase allows for some non-linear attributes to support meaningful development. It is noteworthy to mention that this is not the first time that an adaptation of the original Double Diamond model has been developed. However, it is new to add a repeat or **redesign phase** and identify areas that are optimal for **co-creation**. Table 6 describes each section and phase of the Diminishing Double Diamond design as the following:

Diminishing Double Diamond Design Process		
Phase & Stage		Description
Design Phase	Discover	This phase is a divergent phase. This indicates that the process begins with an initial idea or inspiration and spreads in an outward direction. Observations that lead to research is often the source of the discovery phase. With a user-centric approach, an attempt to identify users' needs occur in this phase.
	Define	This is a convergent phase. In this phase, critical filtering occurs.
	Develop * Value Co-creation	This phase is neither divergent phase, nor a convergent phase. This phase is a development and implementation phase. This is also the phase where value co-creation is optimal for meaningful development. Users and other key stakeholders are involved at this point. Prototypes become a deliverable. Financial and legal support allow for launch.
	Deliver	This phase is a divergent phase. Deliverables are launched, versions and updates are released.
	Evaluate	This is a convergent phase. Evaluation and careful analyses need to be conducted. Teams must possess the ability to make objective observation and analyze information with high empathic aptitude.
Redesign Phase	----- Re-discover	The entire redesign phase is a critical component to the diminishing design. This phase suggests that details from the design phase are refined and specific solutions to specific problems begin to emerge. In this phase, new concepts can be conceived, growth strategies are recognized and meaningful development occurs.
	----- Re-define	
	----- Re-develop	
	----- * Value Co-creation	
	----- Re-deliver	
	----- Re-evaluate	

Table 6: Diminishing Double Diamond Design Process.

The Diminishing Double Diamond design process was created to support the core principles of the *Agile Manifesto* methodologies in software development. At the same time, the design process emphasizes the user as the central focus to co-create value. The Agile Manifesto describes the core principles that underlie the agile vision (Beck, et. al. 2001; as cited by Coplien, J. & Bjørnvig, G. 2010, 7):

“We are uncovering better ways of developing software by doing it and helping others do it. Through this work we have come to value:

- *Individuals and interactions over processes and tools*
- *Working software over comprehensive documentation*
- *Customer collaboration over contract negotiation*
- *Responding to change over following a plan*

That is, while there is value in the items on the right, we value the items on the left more” (Beck, et. al. 2001; as cited by Coplien, J. & Bjørnvig, G. 2010, 7).

The Agile Manifesto is important throughout this thesis because the particular software in focus (being developed by the case company) is an extension to larger software that is agile-developed. Therefore, the principles of agile trickle-down to the development strategies used by the case company. During the process of developing this thesis, it was realized that software developed in an agile fashion occurs rapidly. There are often points of development that significantly enhance the functionality of the software but there are also points where development for the software becomes counter-productive to the user. Coplien, J. and Bjørnvig, G. (2010) explain that classic software architecture tends to embrace engineering concerns too strongly and too early. For this reason, the creation of a new design process was necessary to balance all the components of meaningful development.

3.2.1 Redesigning

The redesign process is a core component to this thesis. Redesign is a major challenge for designers (Edelman, J., Agarwal, A., Paterson, C. & Mark, S. 2014, 32). The act of redesigning provides a sound platform for meaningful development. Edelman (et. al., 2014) supports the notion that redesign is “by no means trivial to the professional design process.” According to Edelman (et. al.), the redesign process can be broken into two types: radical and incremental. **Incremental redesign** is the task of making incremental improvements to an existing design, in a linear, step-wise fashion (Edelman, J., et. al. 2014, 32).

It is further explained that the process of incremental design is a carefully calculated attempt to achieve optimization. Incremental redesign is practiced with meticulous intent and precision. An example of incremental redesign can be explained as a leading car brand that produces a slightly newer model or improvement each year. The new models undergo incremental improvements by design. “This type of design is a remarkable achievement for both industry and academy” (Edelman, J., et. al. 2014, 32). Incremental achievement is fixed to one end of the spectrum, whereas Radical redesign and achievement is fixed on the other end (see Figure 8).

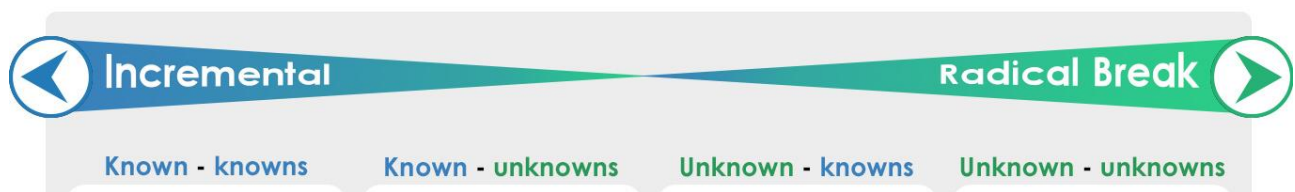


Figure 8: Spectrum of Achievement over Knowns and Unknowns.

Radical redesign is completely different. Edelman (et. al. 2014, 32) explains that the process of radical redesign is less understood than incremental redesign. It is rational to deduce that radical redesign is less understood because of the amount of uncertainties that generate results. Incremental redesign is propelled by certainties, whereas achieving a radical break by design is propelled by uncertainties. In this thesis, redesign serves as a strategy for meaningful development by embracing uncertainties.

3.2.2 Preparing for Unknowns and Radical Breaks

Meaningful development can occur in any phase of the design process. However, the areas of development with the largest impact typically occurs through incremental achievement or radical breaks. The concept of a **radical break** captures what is often thought of as *thinking outside the box*. It is easy to understand that unknowns and radical breaks are not always favored by company founders. From the unknown often comes more tasks that require more resources. Utilizing resources (for instance, time and energy) to create space for a potential occurrence is not always high on a company’s list of priorities. However, it is important to plan for radical breaks even if they do not occur. When radical breaks occur, “they [radical breaks] occur in the course of redesign when designers make a major departure from the task-at-hand” (Edelman, J., Agarwal, A., Paterson, C., & Mark, S. 2014). The ability to embrace radical breaks in the development of a project is comparable to preparing for the unknown. It is a strong belief that exploring what is unknown can lead to significant growth.

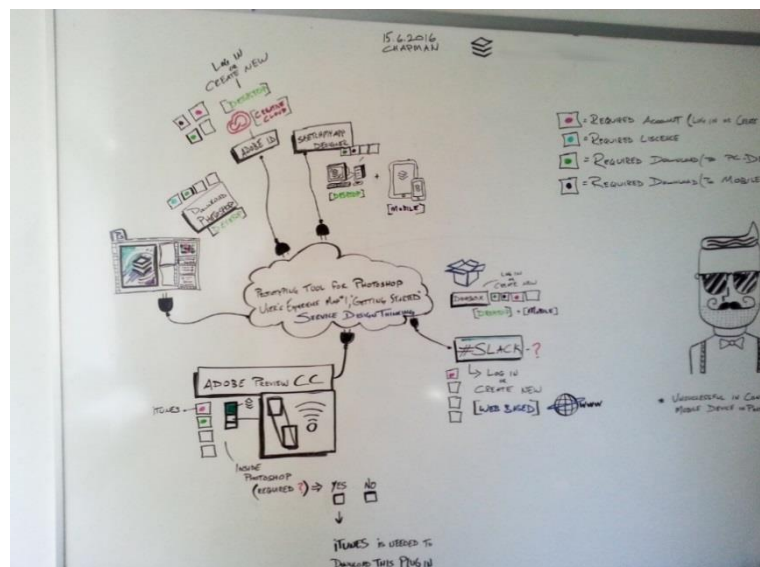
Radical breaks and unknowns in the mobile technology start-up ecosystem are often the key differentiator between a successful exit and a costly re-entry. The space to foster radical breaks is best suited in a redesign process; it is not uncommon to discover unknowns in this process. A team with the ability to use redesign thinking can take advantage of unknowns. Heikki Savonen and Mikko Jäppinen (2013: of Palmu at the time of reference) explain how embracing unknowns with radical design can create innovative service models and shut down the old models at the same time (Savonen, H. & Jäppinen, M. 2013; Davila, T., Epstein, M. & Manzoni, J. 2014). The notion of embracing unknowns through radical design is embedded in the redesign phase of the Diminishing Double Diamond.

3.3 Methods of Information Collection

The methods used to collect information were primarily qualitative user studies. The following section explains the data collection tools used, the approach and rationale. Refer to the aforementioned section (Section 2.5) and Table 5 for method description.

User journey mapping of the onboarding experience was completed. To better understand the users' total experience, a detailed onboarding process was mapped. It is noteworthy to mention that as the author and primary researcher of this thesis, it is safe to say that there was no prior training of or exposure to the case company's software. This allowed for an unbiased extraction of information and insight to occur. The purpose for understanding the user's onboarding journey was to further develop a tutorial service that would offer a combination of audio, visual and screen recorded assistance. Picture 2 depicts the onboarding journey and process.

Picture 2: Whiteboard User Journey Map of Onboarding Process (Chapman, 2016).



Ethnographic (desk) research is a common social scientific method of data collection. Desk research refers to secondary data collected from reviewing and monitoring web analytics. Analytic tools were provided by a web hosting panel. Anonymous website information was collected through free site traffic statistics (social media sites like Vimeo, YouTube, Slack and Google Analytics). Other basic ethnographic information was obtained through user studies like user-views/ interviews.

Semi-structured user-views were conducted as a portion of user studies. The terminology *user-view* was used to emphasize the central focus of the user. Our intents were to remind the users and ourselves that the information collected from the view point of the user should not be influenced by views of our own. It is noteworthy to mention that several structured interviews were initially conducted. However, it was realized that people were less likely to feel comfortable if they were asked to be interviewed. Changing techniques and vocabulary occurred during the development of this thesis. The term user-view was used after one participant mentioned they had practiced how to use the software beforehand, as not to “feel so stupid for the real thing.” The user-views were intentionally conducted at a semi-structured (in other words, informal level). The informality allowed potential users to feel as comfortable as possible and free from experiencing any pressure of persuasion. User-views were conducted online and face-to-face. All face-to-face interviewees were asked, “Is it okay that I take notes?” Notes were documented and all individuals shall remain anonymous. Face-to-face user-view locations occurred in Finland (Turku, Espoo and Helsinki) as well as USA (Central State of New York) and Netherlands (The Next Web, 2016, Amsterdam). The majority of the face-to-face interviews were conducted during The Next Web (TNW, 2016) Conference in Amsterdam. Each individual was given a personal introduction to myself and then the founder. Each individual was also given a brief explanation of the product and the service behind the product. Individuals that provided contact information received a follow-up email addressing any questions that could not be answered in person.

Other user-views occurred online. Time zones were considered favorable to the local times. The locations included the United States (Northern State of Vermont and Central State of Texas). Interviewees were contacted by a referral method. In other words, the contact information of a potential interviewee was provided by someone that believed he or she would be highly interested and proficient in Photoshop. Unstructured conversation allowed potential users to freely exchanged qualitative data/information that was later utilized to implement service-designed concepts (see Figure 9).

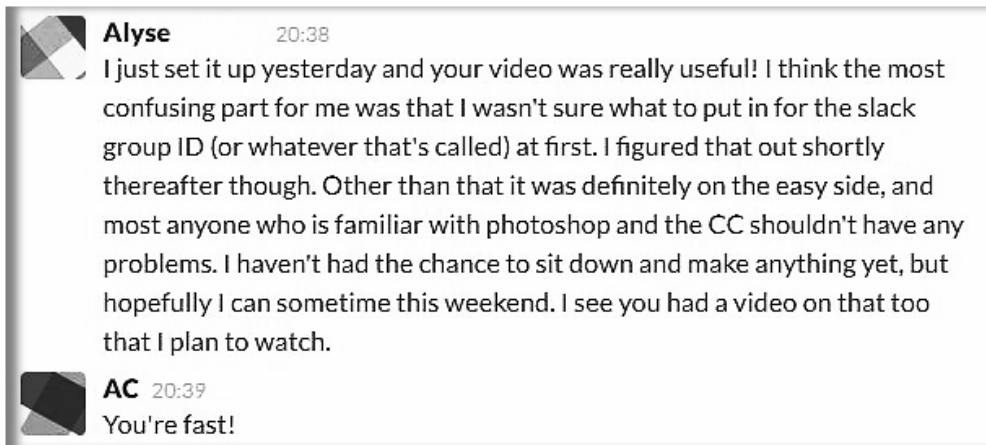


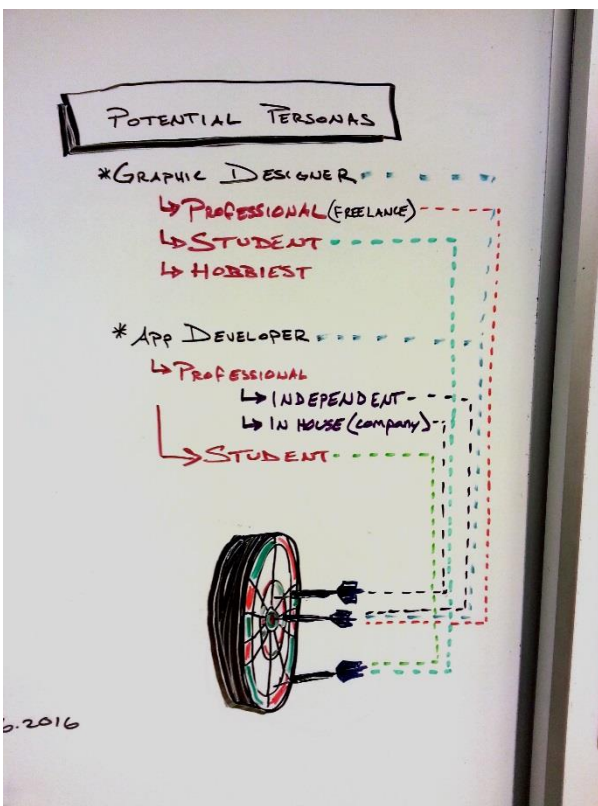
Figure 9: User-view Feedback (closed channel Slack communication, 2016).

Probing was used in all user-views (face-to-face and online). Probing is a common interviewing methods for extracting in-depth information without pressuring, pursuing or intentionally creating biases. It is also commonly known that probing in qualitative interviewing cannot be planned. It is impossible to predetermine what others might consider problematic. Therefore, unstructured interviews were supported by probing techniques (to gain a deeper understanding). Most probing questions encourage open response. Probing questions often begin with “how” or “what” and often avoid asking “why.” Previous and personal interviewing experiences in psychiatric/ therapeutic settings has revealed that asking “why” often leads people to a closed or defensive mental state. Whereas, asking “how” or “what” can entice a people to feel empowered and willing to explain.

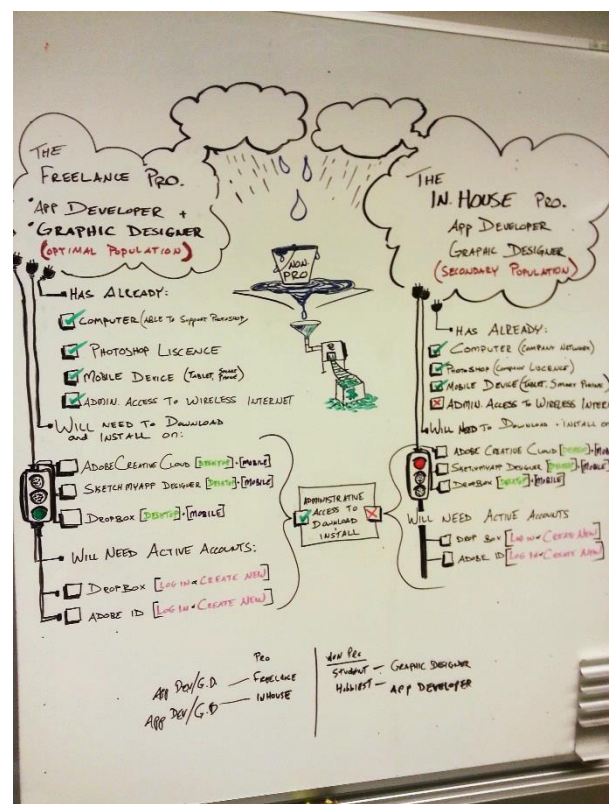
Probing questions were used to understand the individual’s potential need and use of the service without leading or priming answers. Interviewees were placed into categories as a content creator, developer or investor depending on their self-proclamation. Content creators consisted of mostly of digital graphic designers and other front-end, visual designers. Developers consisted mainly of computer programming experts, user interface (UI) experts and back-end software developers. Investors introduced themselves as an

investor and provided contact information. Undocumented user-views that took place online were conducted as networking conversations and forum posts. Online environments included LinkedIn, AngelList, Gust and Slack. It is noteworthy to mention that Slack was a closed channel of communication and operated by the case company CEO by invite only.

Persona Building and Archotyping: Information obtained through user-view analyses helped to shape non-real types of users. It is noteworthy to mention that this was a minor activity but regularly done to better understand possible shifts in target users. Personas were developed during a series of meetings (and unstructured interviews) between the case company founder and myself (See Picture 3 & Picture 4).



Picture 3: Persona Planning and User Target.



Picture 4: Archetypes with Potential New User Type.

Other experts included local artists, students in digital design, professionals in digital design, entrepreneurs that regularly use Adobe Photoshop and entrepreneurs in early stages of building apps. Archotyping was used to build realistic views of current users and users of similar software based on actual ethnographic data and qualitative data from unstructured user-views.

Thinking aloud was encouraged during user studies and supportive observations. It is noteworthy to mention that this method was added in the middle of developing this thesis. The reason being, information gathered through persona building and user archotyping

revealed that potential and current users often work isolated and regularly use self-talk. During observations and user studies, more encouragements were given and thinking aloud became a valuable method.

Direct supportive observations (one-to-one) were conducted at the user’s place of work or home studio. All observations that were conducted, occurred with knowledge of the subject being observed. It is highly unethical to make observations of users in their home or workspace without their consent. Users were observed at a supportive distance in order to study patterns of systematic self-discovery and allow for the users to feel as comfortable as possible. The home or work location was chosen to minimize the possibility of a participant reaching error due to unfamiliar equipment and environment. Support was minimally provided to simultaneously collect points of frustration and prevent the user from gaining a bad experience. This is important for the overall reputation of the developing software.

3.4 Methods of Analysis

The methods of analysis are immersive and heavily influenced by previous training in cognitive behavioral sciences. Qualitative information analysis includes elements of psychoanalytical interpretation. This mode of thinking is congruent throughout the entire thesis and is used to interpret all information. For example, Figure 10 shows an interpretative relationality of a user’s journey and known human needs.

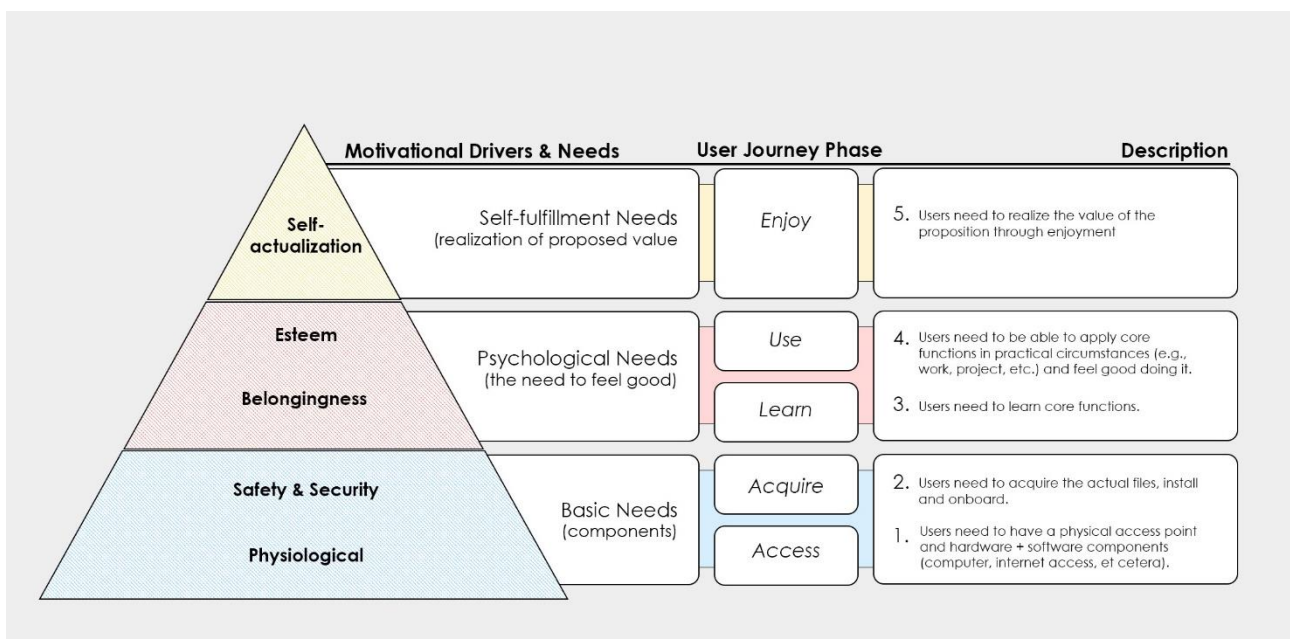


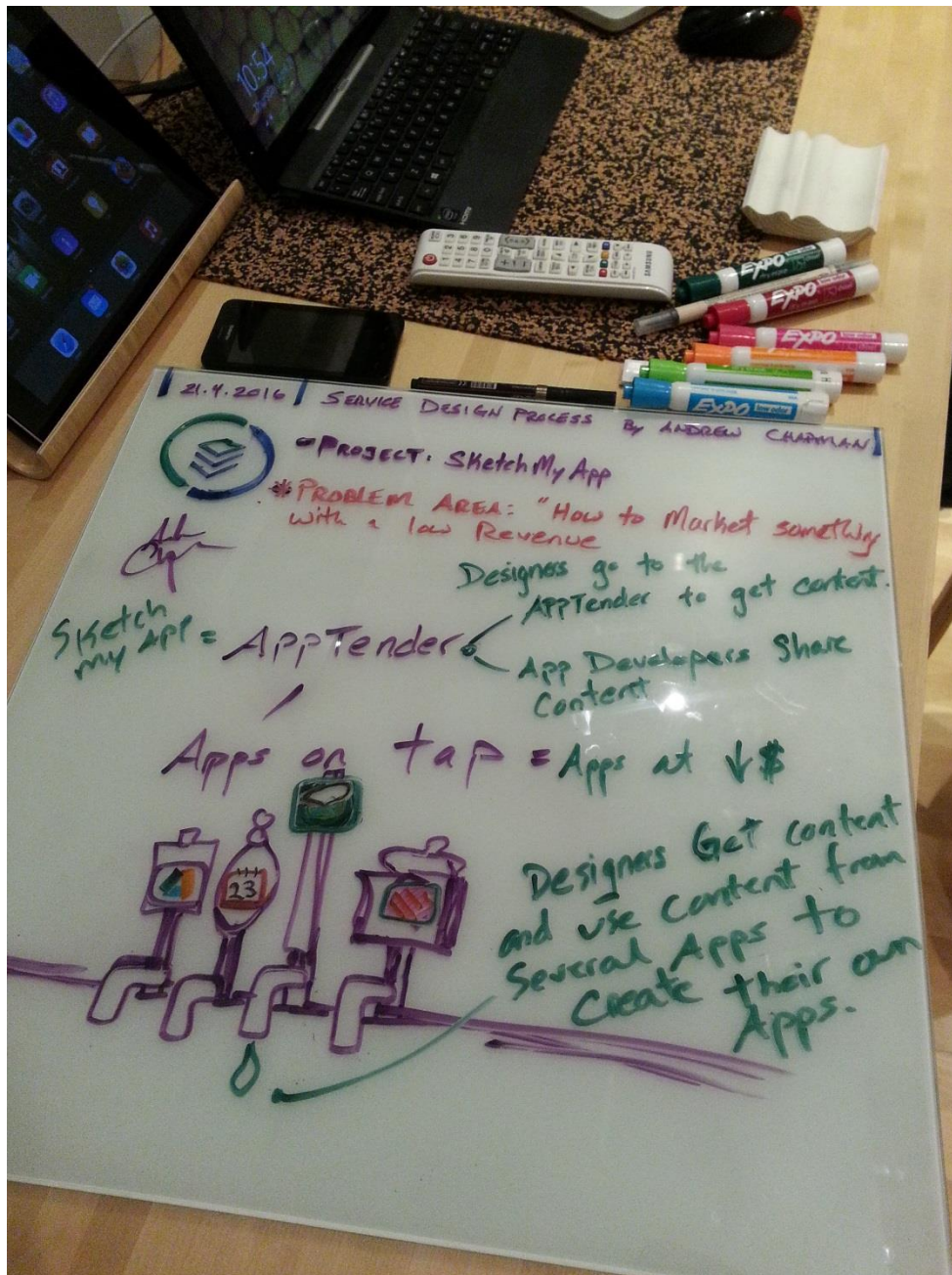
Figure 10: Maslow's Hierarchy of Needs (1954) alongside User Journey Phases.

... *“The physiological needs and the consummatory behavior involved with them serve as channels for all sorts of other needs as well. That is to say, the person who thinks he or she is hungry may actually be seeking more for comfort, or dependence, than for vitamins or proteins. Conversely, it is possible to satisfy the hunger need in part by other activities such as drinking water or smoking cigarettes. In other words, relatively isolable as these physiological needs are, they are not completely so. Undoubtedly these physiological needs are the most proponent of all needs. What this means specifically is that in the human being who is missing everything in life in an extreme fashion, it is most likely that the major motivation would be the physiological needs rather than any others. A person who is lacking food, safety, love, and esteem would most probably hunger for food more strongly than for anything else (Maslow, A. 1954, 16).*

The previous visualization helps to better understand user needs and it is easy to recognize small, yet critical details about the user’s behavior.

3.5 Methods of Conceptualization

One of the main efforts in practicing service design is to incorporate strong visualizations. **Visualizations** were used to make intangible and complex concepts visible. Visualization helps to envision future ideas by visually illustrating how it would work (Moritz 2005, 92; Stickdorn, M., & Schneider, J. 2011). Visualizations were generated regularly in the form of sketches, whiteboard illustrations, digital stills and video production. Picture 5 displays one whiteboard illustration to represent the first sketch of the AppTender service concept.



Picture 5: Whiteboard Visualization of AppTender Concept.

Further development of this concept included more visualizations to help organize and analyze information. A **business model canvas** (BMC) was used to visualize possible structure and general process flow (see Figure 11). BMC's are read from right to left beginning with front stage interaction.

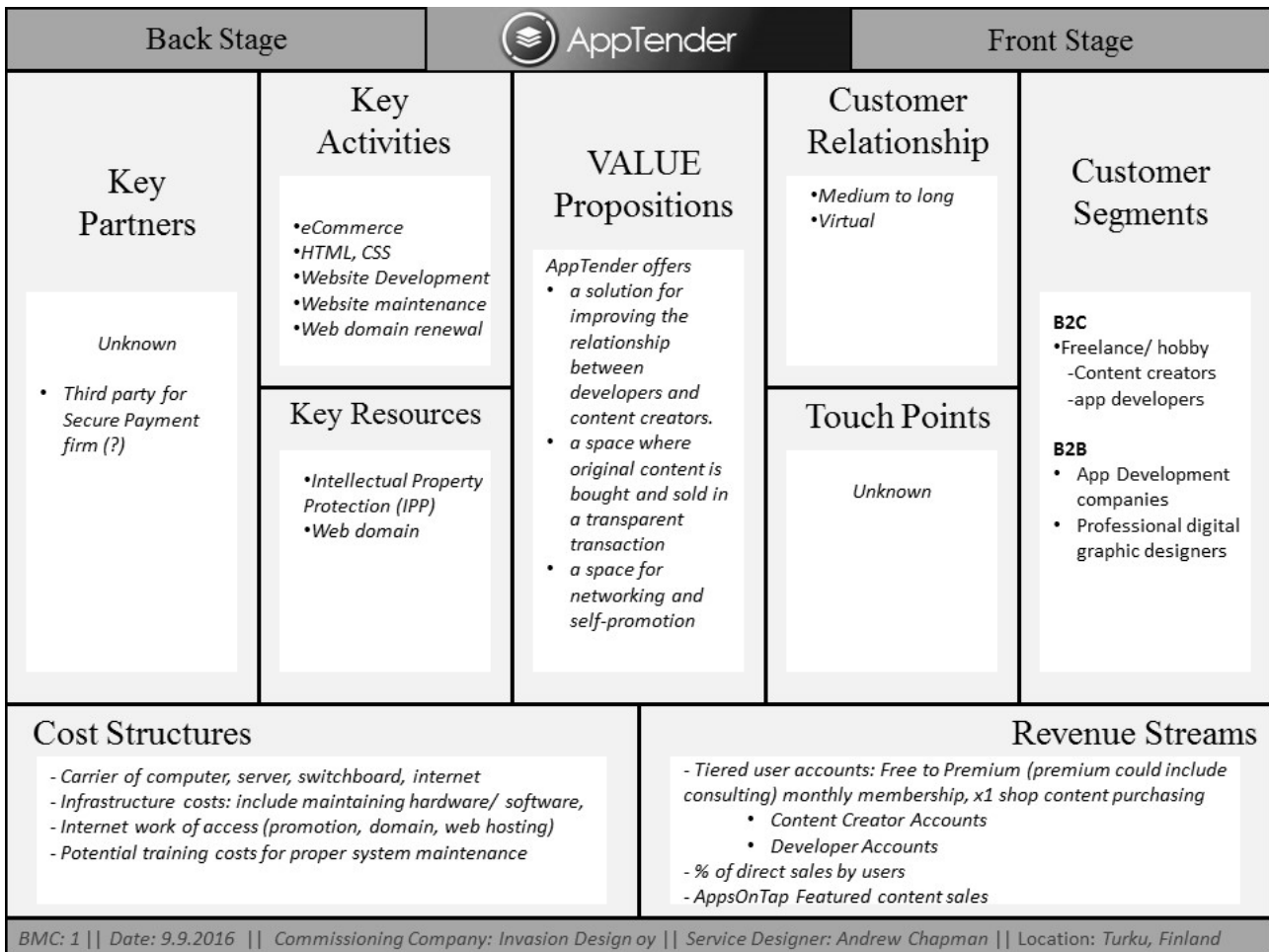


Figure 11: Business Model Canvas of AppTender Concept.

Customer segments include all potential business to customer (B2C) interaction. The customers would include freelancers and hobbyist involved in content creation. Other customer groups would include business to business (B2B) interaction. Businesses operating in software application development and professional user interface design are included in this group.

Touch points and channels are currently unknown and this area indicates strong recommendations for the case company to consider for next step development.

The **customer relationship** would be virtual and medium to long-lasting.

Value propositions indicate that AppTender would offer a solution for improving the relationship between content consumers and content creators. AppTender would offer a space where original content is bought and sold in a transparent transaction. AppTender would also provide a space for networking and self-promotion.

Key activities include E-commerce actions, website development, website maintenance, website domain renewal, hypertext markup (HTML) and cascading stylesheet (CSS) activities.

Key partners would include major third party secure payment services.

Key resources would include the protection of intellectual property rights and website domain security (web branding).

A **cost structure** would be indicative of payments for computer equipment, host server space, switchboard and connection to the Internet. Infrastructure costs would include maintaining hardware/ software and Internet work of access (promotion, domain, web hosting). Potential training costs are considered for proper system maintenance.

Revenue streams would include tiered user accounts Free to Premium (with added features like networking assistance and consulting). Monthly membership and x1 shop/ content purchasing option. AppTender would collect some percent of direct user sales and featured content sales (an additional concept to develop: AppsOnTap).

In addition, a **parallel business model comparison** with an abridged blueprint was generated to add a strong visual to support how the AppTender service concept would behave (see Figure 12). Full-text concept documentation was also developed (see Appendix 2).

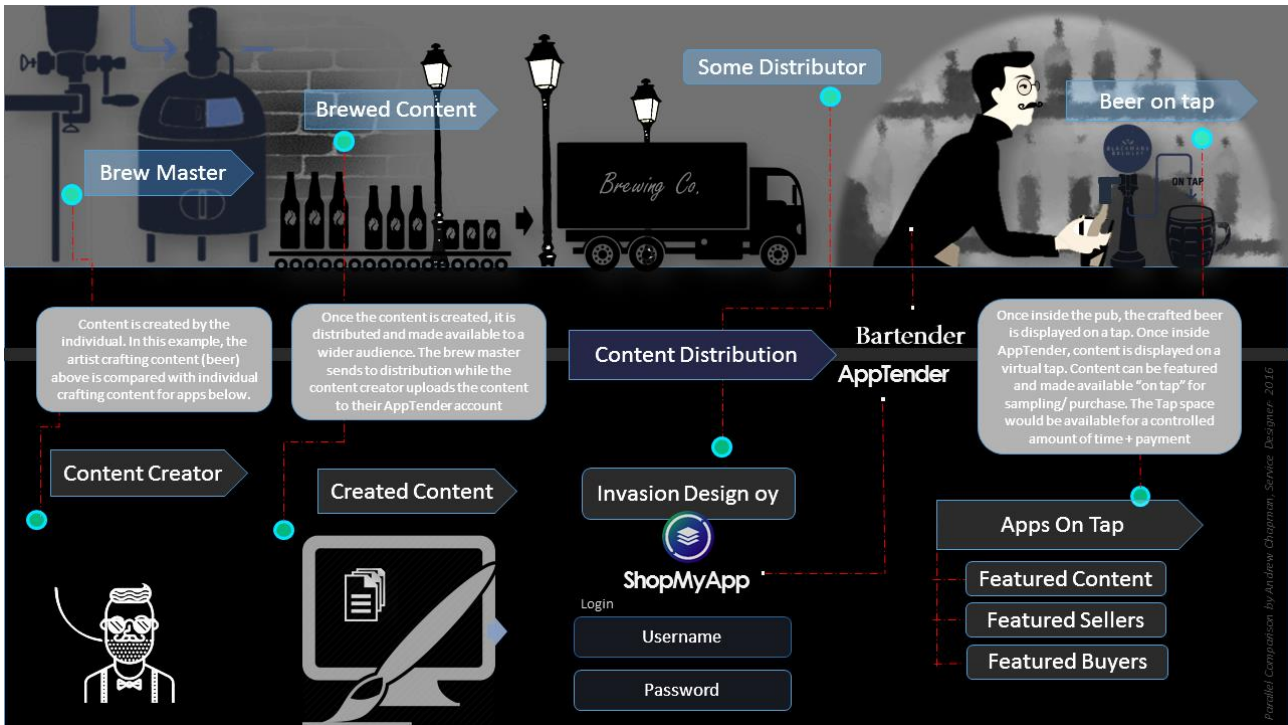


Figure 12: Parallel Business Model Comparison with Abridged Blueprint.

3.6 Practicing Service Design within the Case Company

The process of practicing service design was documented in a daily activity log (see Appendix 4). Practicing service design within the aforementioned case company and start-up ecosystem is described throughout the entire methods section of this thesis. The start-up ecosystem supports the practice of service design in several ways. One of the main motivations for practicing service design in the start-up ecosystem is to gain maximum value of available resources. Resources in the start-up ecosystem are often costly and extremely limited. It is within the core aim of this thesis to apply principles of service design with limited resources to achieve meaningful development.

This case study required initiating intensive and immersive strategies of service design within the case company. The practical implementation of service design included preliminary research based on previous benchmarking notes presented by the case company.

The process of applying service design began with preliminary research and benchmarking. It is noteworthy to mention that the case company conducted an extensive amount of benchmarking prior to introducing the efforts of service design. This information was utilized but not expanded upon. Part of the preliminary research also included fully understanding the case company's vocabulary of jargon. Jargon included terminologies, lingo, names of specific software already in use and common terminology related to the mobile-tech industry.

After gaining foundation knowledge, the next step was to incorporate a design process to organize and keep track of progress. Once the initial design process was chosen, the process was implemented (see Section 2.2: Research Framework and Design). The initial design process used was the Double Diamond design by Design Council (2005). Strategies for collecting information began to emerge and the majority of the information that was collected is qualitative (see Applied Methods: section 3.0).

The process of collecting this information involved attending major technology conferences (The Next Web 2016: Amsterdam, Netherlands and Slush 2016; Reaktor.D: Helsinki, Finland). Interacting with other experts and specialists in the case company's industry was a major part of building empathy throughout this thesis. In order to increase my empathic aptitude, it was also necessary engage in ongoing discussions with current users and potential users. Semi-structured interviews were conducted with people that expressed interest in the case company (see Methods of Information Collection: Semi-structured user-views).

The information collected was shared with the case company CEO. Information was shared through visualization. Service design methods used to convey gathered information included business model canvassing, parallel business model comparing and full-text design documentation. Information was filtered and analyzed with high empathic aptitude based on actual user insights (Appendices 1–2). Insights based on user-views were discussed and the process of physical development began. During the development stages, physical development of the software was implemented by the case company CEO. This was simply based on the fact that writing code and computing tasks are outside the scope and responsibilities of the service designer (in this case). The service designer carried out

responsibilities to utilize information gained, convey to that information to the CEO for development and then design services around assisting users to learn the software being developed (see Appendices 6–9; video files 1–4).

The process of building and implementing material for a learning service a main objective for this thesis. The material includes carefully planned audio (voice over), strong visualizations and precise displays of what new users would experience. Screen recordings of onboard action and installation were captured, edited (in Adobe Premiere Pro) and launched on the case company's active webpage.

3.6.1 Prototyping a Prototyping-tool

The main offering by the case company is a software tool that can be used for creating prototypes of other software. In other words, the case company provides a tool that others can use to create software. In software development, the process of creating and testing is known as prototyping. Most prototypes are designed to function as best as possible and be represented as close to the actual product or service as possible. The software offered by the case company also required early version testing and prototyping. It was beneficial for people in various disciplines to be involved during prototyping activities. The process of prototyping a prototyping tool was supported by various methods of service design throughout the entirety of this thesis. As mentioned earlier, there has no special instruction or training given while working to understand the case company's software. Part of gaining true user insight involved immersive methods of learning how the software functions. It is noteworthy to mention that other experts and specialists in related disciplines were also involved in the prototyping process.

3.6.2 Co-creation between Multiple Disciplines

Multidisciplinary co-creation occurred between peers (academic colleagues), industry professionals, students within software development, students within graphic design, professionals within digital graphic design and software application development. It was a high priority to engage with these individuals directly, however, this was not always the case. Because of the nature of this industry, many individuals with superior skills and knowledge on the subject were located within popular technology forums and discussion boards online. Active discussions with critics and potential users yielded valuable information that was used to generate results.

4.0 Results

THE CUSTOMER IS
ALWAYS ~~RIGHT~~
↳ EXPERIENCING

4.1 Summary of Results

A summary of results and findings for this particular study are revealed as the following:

Service design thinking and redesign thinking are highly effective in conceptualizing strategies for start-up company growth. A new design process was created and implemented (see Section 3.2: Development of Diminishing Double Diamond Process of Design). This result is a theoretical contribution to the overall practice of service design. It was necessary to adapt a design process for this thesis in order to connect user-centric design with principles of agile software development. The development of this design process occurred as a result of combining key phases of the Double Diamond model by Design Council (2005) with the phases of the Human-Centered Design model by IDEO.

Utilizing persona building and archotyping as service design methods revealed that users often work isolated and regularly engage in self-talk. This information is highly recommended to be utilized for future development.

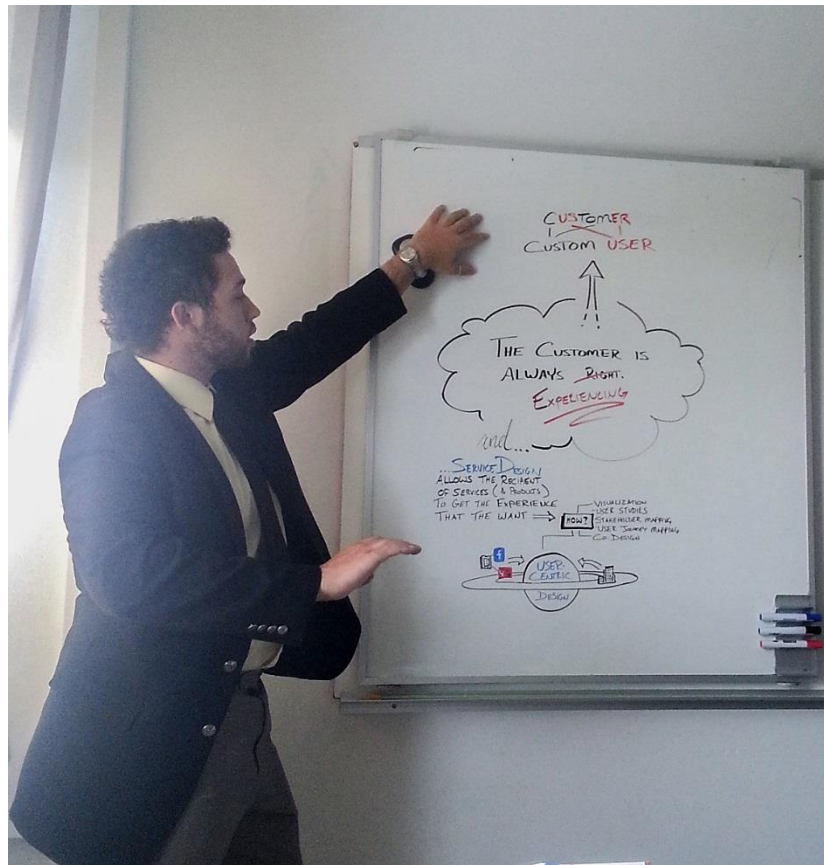
It was also discovered that the case company's software did not have a definite identification by the users. In other words, some users recognized the software as a service (SaaS) and others recognized the software as a product (SaaS). It is noteworthy to mention that this information lead to the design and development of a digital learning service.

A new online learning service was designed and implemented. The information leading to this production was a direct result of analyzing users' experience with a high empathic aptitude. The learning service was launched and made accessible through the case company's landing page. Guided tutorials were scripted and recorded (by the author of this thesis) according to users' most valued needs (see Appendices 6–9).

Service design efforts further revealed that there is a disrupted relationship between content creators and content consumers. Through applied methods of service design, a new concept for distributing content was delivered. This concept would serve as an opportunity for significant growth (within the case company) and also improve the dynamics between two prominent groups of specialists in the app development industry.

4.2 Additional Results Explained

Picture 6 indicates some insights that were shared in a small presentation where user-centric focus lead to the breakdown of the word *customer*. During the analysis of information gained through service design methods, two new views were realized about the customers.



Picture 6 (right): Photo of Andrew Chapman Presenting Insights (Chapman, 2016).

The first view comes from breaking down the word *customer* and using the available letters (or available resources) to generate new thinking (see Picture 7). This is also partly a result of not knowing what to actually call our users/ customers. The term *custom user* describes the users as a central focus and allowed for meaningful development to occur.



Picture 7 (left):
The Customer is a Custom User.

The second view was derived from analyzing information direct from user studies. It was made clear that even though user insight is important, software changes and development cannot always be based on user insight alone. The idea that “customers are always experiencing” was developed as a result of applied methods of service design and analyzing information with an empathic mindset (see Picture 8).



Picture 8: The Customer is Always Experiencing.

4.2.3 Discovering Dev-Opps

Development opportunities that were discovered. The term **Dev-Opps** (Development Opportunities) was created for the purpose of categorizing highly viable and practical opportunities for improvement (See Appendix 5). These types of improvements were identified through the practice of service design and careful analysis of information (including extraneous information) with high empathic aptitude.

4.2.4 Service(s) Developed and Implemented

The design and development of a digital learning service is a direct outcome of applied service design as a strategy for growth. Digital (audio and video) tutorials were created (by the author of this thesis) and launched live to the case company's "Learn" webpage (see Video files; Appendices 6–9; video files). Learning service tutorials include guides for the onboarding process, installation, basic operation, intermediate use and advanced features (like adding transitions and display scaling).

The development of service for the case company included the use of new jargon. The terminology *Dev-Opp* (abbreviated from development opportunity) was used to identify highly viable (Hi-Vi) concepts that should be supported and advanced forward. Hi-Vi solutions and Dev-Opps were derived from extensive user studies (and various methods; see Section 3.0). The term Dev-Opps was used in this case to describe a practical opportunity to develop software in a way that was considered critical to the users' experience. Suggestions for improvements were routinely introduced through regular testing. Even though user studies generated many improvement points, some changes suggested by users were unnecessary. This was due to the fact that some users lacked basic experience with Adobe Photoshop (as the main software). Therefore, some suggestions were not applicable. However, this information was analyzed with high empathic aptitude and therefore lead to further development of a digital learning service. Applying principles and methods in user-centric service design allowed for further analysis of information that would typically be considered irrelevant. Information was utilized to co-create useful material.

4.2.5 Target User Relationship Development

In conducting research for app development and content creation, it was easy to understand that there is a disruptive relationship between **content creators** and **content consumers**. The divided relationship between content creators and content consumers has formed as a secondary problem area in this thesis and is recommended for future works. Throughout the development of this thesis, it became easy to understand that there is indeed, a divide between content creators and content consumers. It was even further understood that this divide is problematic. It was only after participating in several workshops and team innovative activities (to create and consume content) that the complexity of this relationship was fully understood.

4.2.6 Concepts Developed

Through applying strategic service design methods, a new service concept was developed (see Appendix 2; see Figure 12). This service (concept) would offer a transparent marketplace where content creators can distribute their content, content consumers can search and purchase content and both groups of specialists can utilize the platform as a personal networking tool. This service (concept) is a direct result of applied empathic user studies and service design methodologies to strategically promote growth within the start-up case company.

4.2.7 Start-up Growth

The case company was successful in acquiring a significant amount of information and knowledge without exhausting many resources. Because resources are limited in early stages of start-up growth, it was a main objective to utilize service design as a means extract more resources (like knowledge and information), from the same starting amount. Through user-centric service design, the users' needs were better understood and a learning series that improved their [users] overall experience was successfully implemented. Growth was also recognized through conceptualizing and visualizing complex strategies to attract investors.

5.0

Future Works and Recommendations

Picture 9: Panel Discussion at Slush Conference (2016).



Marko Ahtisaari
(CEO & Co-Founder at Sync Project)

Olof Schybergson
(Founder & Co-Lead at Fjord)

Karri Saarinen
(Design Lead at Airbnb)

Anne Stenros
(CDO at City of Helsinki)

Recommendations for future works are derived from the insights gained during the development of this thesis. The following subsections introduce topics related to service design and leadership that should be explored in the near future.

5.1 Balance-centricity

Currently, companies that are not design-oriented often expect the role of a service designer to deliver “silver-bullet-solutions” on demand. At the moment, this is an unfortunate reality that many designers seem to experience. That is why balance-centricity is a highly recommended topic to explore. **Balance centricity** is an approach to development that supports equilibrium between user-oriented details and business-oriented details. Balance centricity is contrary to the customer-centric, human-centric and/or user-centric credo and suggests that satisfied customers are not the only drivers for success (Gummerson 2007, 24). Balance centricity is a viewpoint that removes the focus from designing under a total human-centric lens. A total human-centered approach can distort the perception of actual happenings in reality. Future works would emphasize the importance of balance centricity. Evert Gummerson frequently references this ideology in some of his earliest works.

A philosophical quote (known to have been circulating as anonymous before attributed to L. A. van de Snepscheut, Yogi Berra and still, to several others) from Don Norman’s book *The Design of Everyday Things*, adds tremendous emphasis on the importance of balance-centricity:

*“In theory, there is no difference between theory and practice.
In practice, there is.”*

Don Norman (2013) explains that, “The human-centered design process describes the ideal. But the reality of life within a business often forces people to behave quite differently from that ideal” (Norman, D., 2013, 236). Another influential work that uses the word *reciprocity* as a way to describe balance-centricity, is work by María Quero and Rafael Ventura (2015). The term **reciprocal-value-creation** is used to emphasize the importance of balance centricity in the co-creation of value (Quero, M. & Ventura, R. 2015). Future works and recommendations would include the exploration of service design under a balance centricity lens. This viewpoint acknowledges the entrepreneurial mind-set and suggests: satisfied customers are not the only drivers for success.

5.2 Starting Point of a Design Process

Many design processes have a beginning, but few discuss the act of getting started. Future works focused on the starting point of a design process (see Figure 13) is recommended.

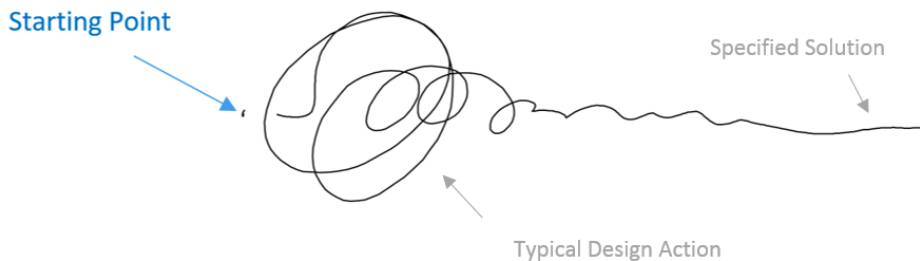


Figure 13: Starting Point as the Focus in a Design Process (adapted from Newman, 2010).

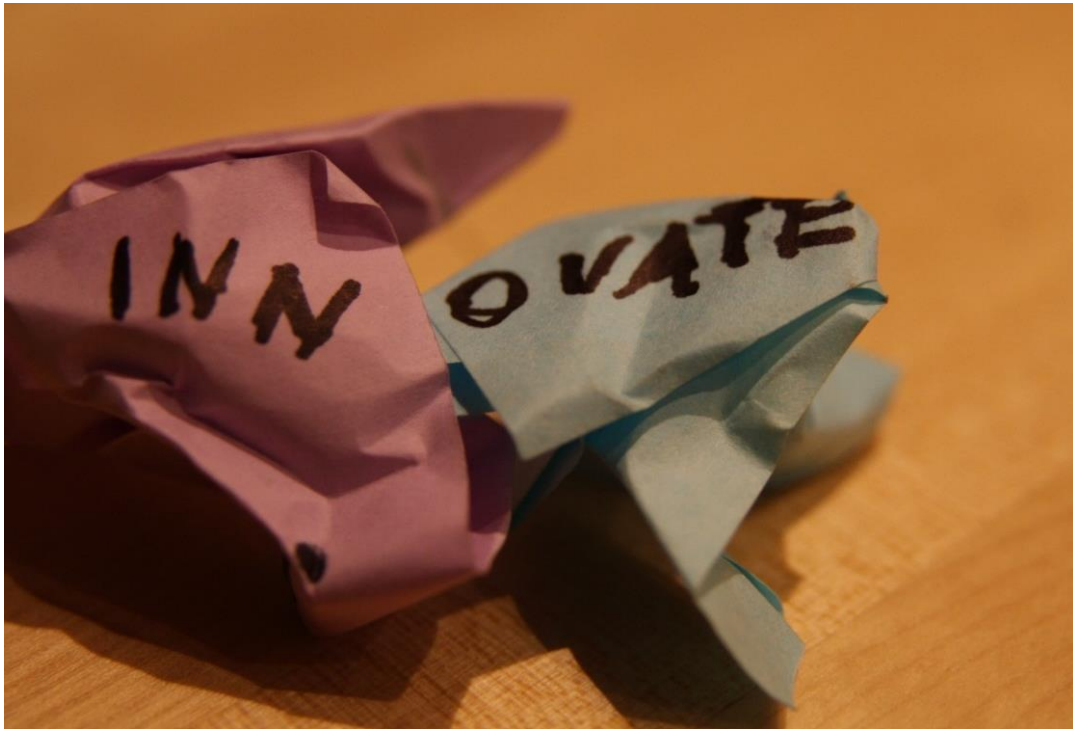
Figure 13 is a derivative model based on *The Design Squiggle* (Newman 2010). One topic that would add significant value to service design as a practice would be to examine the process of starting. Many design processes provide detailed instruction on how to move from one phase to the next, but the emphasis on the starting point is missing. *The Dot* by Peter Reynolds (2008) is an illustrated children's book that explores this complex process. It is strongly recommended to explore the starting point of a design process and implement the findings in future service design practices.

5.3 Measuring Frustration

It would be interesting to examine the balance between the amounts of questions that a typical user would ask before feeling foolish and totally frustrated. Multiple users reported that they "feel stupid" when they could not complete specific task. In many situations answers and solutions alleviate frustration. As a service designer, it is important to examine points of frustration carefully. It is helpful to collect answers from experts. However, expert insight does not always hold the same amount of value as users' experience and insight.

The reality is that users may not have the opportunity to ask a lot of questions. This might help explain why some users fail to achieve an optimal level of enjoyment. Maslow's hierarchy of needs supports that psychological needs like esteem (or feeling good) must be met in order to progress.

If users ask a lot of questions, then there becomes a point at which they begin to feel “stupid” (actual response from x2 different users). It would be interesting to continue user studies to examine the amount of questions that users would need ask before reaching maximum frustration. This type of study would help to understand what prevents users from reaching the fulfillment stage and realizing the company’s proposed value.



Picture 10: Innovation through Frustration.

5.4 Design in the C-Suite

The C-Suite is commonly known in business practice as the grouping of chief-level executives. The groupings within the C-suite often include titles like, Chief Executive Officer (CEO), Chief Financial Officer (CFO), Chief Operations Officer (COO) and Chief Design Officer (CDO), just a few. In a symposium discussion at Slush Conference (2016), Marko Ahtisaari (CEO and Co-Founder of Sync Project), Anne Stenros (CDO at City of Helsinki), Olof Schybergson (Founder & Co-Lead at Fjord) and Karri Saarinen (Design Lead at Airbnb) discussed the topic of "Why Is Design Moving Over to the C-suite?"

The future of design is evolving in a critical way to be relevant in the C-suite. Olof Schybergson explained that large companies are turning to design as a strategy to innovate. One of the biggest values added to the C-suite is designers' ability to actually visualize something that is often abstract and theoretical. Schybergson (2016) also pointed out that design has already moved to the center of strategic development in the technology and data industries. He further explained that the number of designers that are most engaged with business and business design is already growing (Schybergson, O. 2016). Anne Stenros (Chief Design Officer at City of Helsinki) explained that, "Designers don't want to just stay designers anymore; they want to influence and make an impact" (Stenros, 2016). Beyond business design, civil innovation and political design are on the frontier of design as a practice (Stenros, A. 2016; Schybergson, O. 2016; Ahtisaari, M. 2016).

6.0

Discussion

This thesis offers theoretical and practical contributions that support the practice of service design. Practical contributions include the implementation of well-known service designing strategies to design and launch services, visualize new concepts and stimulate growth within a start-up company. Theoretical contributions include the conceptualization of a Diminishing Double Diamond design process and an in-depth analysis of main ideologies related to design.

6.1 Research Questions Revisited

The original question that was proposed by the case company was, “How can we [the case company] market low revenue content (i.e., \$1.00 - \$3.00)?” A proof of concept (POC) was written (see Appendix 2) and a visual infographic was created to detail the business model concept (see Figure 12) of AppTender. AppTender is a direct solution to generate revenue from material that sells for \$1.00 to \$3.00. It is also a platform to develop a unique marketplace with profit potential. The development of this concept is a direct result of applied user-centric service design and answer to the originating research question. The remaining research questions are addressed as the following:

[1] *What influences the pricing of content (regarding app development)?* The practice of service design revealed that pricing of content is significantly influenced by the cost of acquiring resources. It was also revealed that software application developers are relying heavily on innovative strategies to do more with a finite amount of resources. This realization lead to further investigation (by means of user and empathy studies; see Section 3.0; see Appendix 1 & Appendix 2). It was also understood that there is a broken relationship between content consumers and content creators.

[2] *How can we enhance the relationship between content consumers and content creators?* The highest viable solution to this research question also developed in the form of a new service concept of AppTender (see Appendix 2; see Figure 12). AppTender would offer a transparent marketplace where content creators can distribute their content, content consumers can search and purchase content and both groups of specialists can utilize the platform as a personal networking tool. This concept is a direct result of applied empathic user studies and service design methodologies to strategically promote growth within the start-up case company.

6.2 Benefits of Service Design

Through applied theories and methodologies in service design, significant resources were co-discovered and used to co-optimize growth strategies. Although growth specific key performance indicators (KPIs) were not set, it was still realized by the case company that there were several benefits of applying service design methods to a start-up environment.

Service design thinking fostered the development of potential radical breakthroughs without using extra resources. One of the main motivations for practicing service design in the start-up ecosystem is to gain the maximum value of the resources that are available. Resources in start-up ecosystems are minimal. Through the practice of service design, a significant amount of resources that were already within reach were able to be reused. Service design thinking enabled the co-optimization of innovative growth strategies. Start-up growth is propelled by resources like information and knowledge. Implementing service design strategies inside a start-up company provided an advantageous acquisition of information. For example, as mentioned earlier, the case company viewed its software as both a product and a service. At the start of this thesis, it was unclear if the software should be delivered as a product (SaaP) or as a service (SaaS). It was revealed that applied service design helped to extract valuable information about users' viewpoints. Some users that had old versions of the host software recognized the case company's offering as a product. Others that utilized the later versions and the cloud-version of the host software recognized the case company's offering as a service. This type of information is critical for developing a growth strategy. This information can and should be shaped into actions that give a company its complete edge.

6.3 A Brief Message from the Founder

"I'm happy with what we've achieved. It has definitely been worth the time and money invested. You'll likely see your work as a production element in the near future" (Kiviniemi, M., CEO).

6.4 Closing Reflection

The possibilities to utilize service design extend beyond ordinary boundaries. When trying to list all of the possible needs for service design, it is more practical to identify the situations not to use service design. Outside of literature, service design is fully immersed in our daily lives. Anywhere that there is a need, there is a service; anywhere there is a service, there is a need for service design. Without service design, it is certain that service and product development suffers. After gaining first-hand knowledge, it is clear that applying service design methods and tools can significantly impact start-up company growth. Service design identifies meaningful interactions between what a recipient needs and what a company is offering. The possibilities of service design are ever-changing and rapidly expanding. Companies are quickly changing development methods to include creative thinking to diversify idea generation. The possibility for service design to exist in every company that provides a service is already happening. The service industry is becoming more accessible to a wider variety of people with many different needs. It is important to understand how to connect a company to a customer and those to other stakeholders. Service design has already begun to shift towards public service organizations as well as government agencies. It is a strong belief that social services and relief services will begin to rely heavily on professional service designers to provide sustainable solutions to a fast-changing societal structure. In my closing opinion, the possibilities of service design are as open as the imagination.

About the Author



Andrew P. Chapman is a native to upstate New York, USA. He has also lived in Finland, where he began practicing service design. In 2015, he attended a cooperative Finnish and Swedish University of Applied Sciences as a Master's scholar in leadership & service design. He is an alumnus to Syracuse University, Utica College. His previous training is structured on behavioral psychology and visual arts. He has worked as a specialist and service provider to

Favorite thing to do as a service designer:

"I like to do the things that I don't know how to do."

provide recipient-centered services throughout Central New York.

Why Service Design? I found this answer during the transition from service provider to service designer. Some services are just poorly designed and simply broken from the start. For me, it has become my mission to make a positive impact, early on. A well-designed service can do wonders for the people that make up an entire organization.

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Appendices



User Experience with Onboarding Process

A short qualitative heuristic study (observation, discussion and analysis)

Date of observation July 28, 2016

Date of analysis July 29, 2016; Revised August 9, 2016

Commissioning company: Invasion Design oy
Project: sketchmyapp
Project owner: Matias Kiviniemi
Service designer: Andrew Chapman
Central New York - USA || Turku, Finland 20100

Appendix 1(2): Comprehensive User Study (continued)

Introduction

This is an analysis of an observation conducted using heuristic methods for qualitative data collection. This analysis includes an observation and analysis of a new user's experience with the process for onboarding to SketchMyApp. Methods and rationale are provided along with results, discussion and suggestion for improvement. The purpose of this observation is to understand the areas of this software product/ service that can and should be improved to enhance the user's experience.

User Demographic and background:

The participant in this observation is also referred to the "user" or "participant." The user is a 31 year old female from the Central New York area, USA. She is a part-time professional photographer and digital designer. The user informed me that she uses Adobe Photoshop daily and her skill level with the Creative Suite 5 (CS5) is at an intermediate level. The user is a first time Adobe Creative Cloud subscriber and has not used the later version of Photoshop CC 2015. She has a previously existing account with Dropbox but is new to #Slack. The equipment that was used is a new machine purchased and set up x3 days prior. The machine is a personal workstation and the user has full administrative rights. The participant has future plans to build a website and would also like to have an app for her customers.

Method(s):

The participant was selected by methods of reference. She was referred by another professional in the area. A meeting time was agreed and the participant understood that there was no incentive other than providing information to develop a new service. Then, a qualitative heuristic evaluation was conducted at the user's place of work/ home studio. Heuristic studies were used to study user pattern and systematic self-discovery. The home location was chosen so that the participant could feel as comfortable as possible while using their own equipment. The participant was given minimal support during the process (as not to contaminate the value of self-discovery) and was instructed that, "There is no right or wrong way to proceed." On the day before this meeting, the participant was given a website link to www.sketchmyapp.com with a short description that explained:

"SketchMyApp is an extension that you can download. It is plugged into Adobe Photoshop and can be used to design samples of apps. You can test your app designs on your own tablet or smartphone to see exactly how it could look without having to code it yourself."

Appendix 1(3): Comprehensive User Study (continued)

I (the observer) was positioned next to the participant and took notes. A post-event interview was conducted to gain deeper insight to the user's experience.

Results:

The participant became frustrated and was unsuccessful with an independent onboard. The participant was unlikely to continue to use this tool without direct support. Onboarding was completed only with direct support. The total length of time was about 60 minutes. Independent onboard attempt time \approx 45. Assisted onboard time \approx 5 minutes. Direct observation time (in the same room) was 30 minutes. Indirect observation time was 20 minutes; it is important to note that I left the room after I noticed the participant becoming distracted by my notetaking. I left the screen open for the participant to see the notes and moved to another room. The length of the post-event discussion with the participant was about 10 minutes. The participant is currently following up with other comments and questions via email.

Discussion:

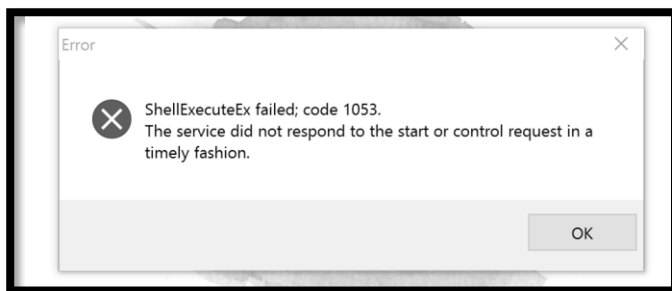
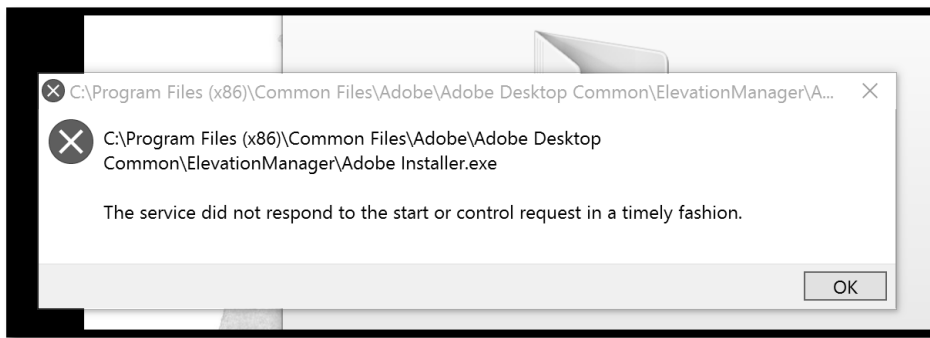
The participant accessed the SketchMyApp website without issue. It was noted that the participant seemed to scroll the entire page and clicked some of the icons before reading directives and made a comment, "Whoa, there's a lot happening here." I followed up with this and asked the participant to explain. It was explained that:

"There are a lot of things moving and really small pictures. It takes a little while to figure out what I'm supposed to do next."

The participant proceeded without assistance to *Get started*, selected to sign in with an already existing *Dropbox* account. The participant expressed that it was "annoying" and not clear what to do next after acquiring the add-on from Adobe official website. The participant expressed that this was where she "got lost." There was significant confusion immediately after linking the *Dropbox* account. It was not clear that the image on the website was a .GIF (see [Step 2: Photoshop Plugin .GIF](#)).

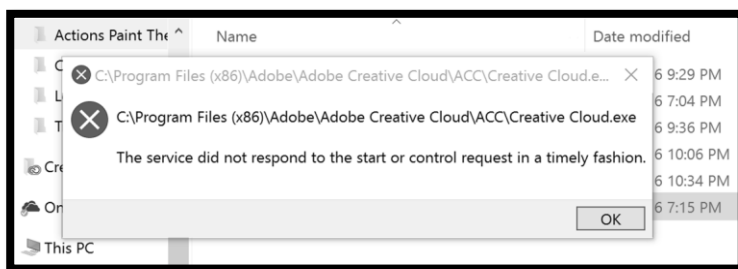
The participant referred to the troubleshoot text on the Adobe online page after acquiring the add-on. Several attempts were made to refresh Adobe Creative Cloud (desktop app) and each event failed. The participant received multiple error messages. Each message was captured, saved and can be found below (refer to figures below)

Appendix 1(4): Comprehensive User Study (continued)



The participant became apprehensive about the amount of error messages and began to express concern for her new computer. “Okay, I’m started to get worried now. I hope this won’t mess up my new computer.”

My presence and seat positioning could have interfered with the user’s performance. There were several occasions when the participant became frustrated, turned to me and said, “Oh, no! I feel stupid. What am I doing wrong?” or “what are you writing? Is it me? Why can’t I figure this out?” I noticed



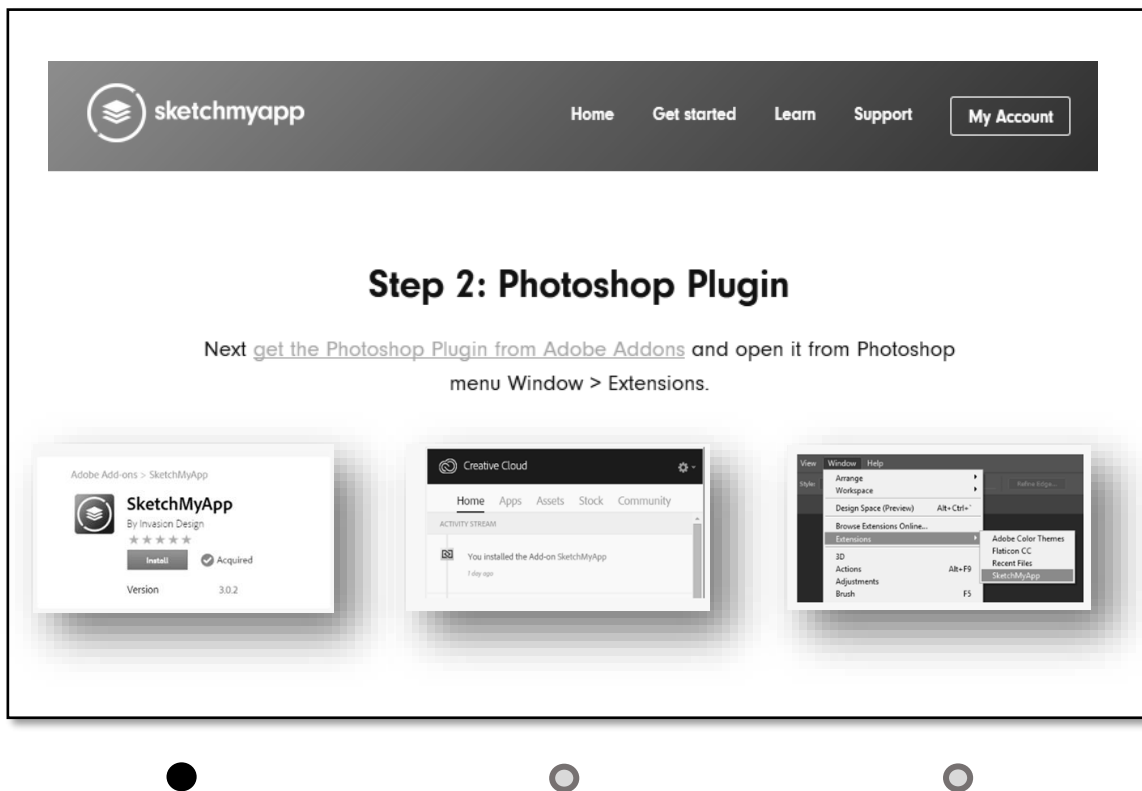
that just my presence was enough to interfere with heuristic methods so I left the room for 20 minutes. It was noted that the user frequently referred to error message boards and FAQ’s in the official Adobe website.

At this point, total assistance was provided for the remainder of the onboarding process. A cold reboot was required after the system froze and warm reboots (with keyboard commands) failed. It is noteworthy to mention that the participant is not in the profession of building apps. Professionals that build apps would be the optimal population sample for observation. Further efforts ought to be focused on targeting app developers. Challenges with seeking this target population might be that the sample size is small. Professionals that develop apps might be already using software and would be unwilling to start their projects from scratch.

Appendix 1(5): Comprehensive User Study (continued)

Improvement Proposal(s)

Add prompts to close programs and reboot. It is clear that the process for new users is a time consuming procedure. Prompts to close Photoshop and restart the computer are necessary in order to expedite the procedure in a timely manner. This will significantly reduce the level of frustration during the onboarding process. It is safe to say that users experiencing major frustrations during the onboarding process are likely to discontinue using service (even with continuous updates) and certainly not try it again. Change GIF tutorials to still frames with numbered steps (see Step 2: Photoshop Plugin .GIF).



Add tutorials with video and audio. This should significantly reduce the amount of confusion for onboarding. Tutorials should also increase the amount of reassurance that new users need to feel comfortable when installing software they are unfamiliar with. With the amount of additional software that is required to be installed, it is crucial that SketchMyApp provides as much support and information (about additional software) as possible. In addition to tutorials, adding user-friendly explanations of each software interaction that is required to run should significantly reduce apprehensiveness. In other words, SketchMyApp should deliver a short explanation as to why Dropbox, Slack and Adobe Creative Cloud are important. In this explanation, the user should be briefed about each program and how they interact with each other.

AppTender Proof of Concept Design Document

Date of origin: April 21, 2016
Revised: September 9, 2016

<p>Commissioning company: Invasion Design oy Project: AppTender Project owner: Matias Kiviniemi, CEO Document Author: Andrew Chapman, Service Designer</p>
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Document Brief:

Introducing, AppTender and AppsOnTap as a subsidiary service to SketchMyApp. This concept design document highlights the thought process and proof of concept development under the commission of Invasion Design oy.

Appendix 2(2): AppTender Proof of Concept Design Document (continued)

Company Background: The company in focus is a micro-sized start-up located in Finland. The company functions mainly in the industry of information and technologies.

Primary Service: The primary service that is offered by the company is a tool in the form of software. The tool is a type of software that can be “plugged-in” to creative design software like Photoshop. The add-on software functions as a prototyping tool intended to be used by content creators and app developers. Using this tool offers a rapid prototyping experience that saves time, reduces confusion in design documents and increases workflow within design teams. The rapid prototyping service allows content creators and app developers to build, test and share their designs live, without coding.

Relevant Proofs: Apps have become a common, if not, essential part of development in mobile technology. The majority of mobile devices operate with the use of apps. There is a fast growing market for a wide range of devices from watches to televisions that have adopted app technology. An overwhelming majority of people in general, on a daily basis use smartphones. Nearly all owners of smartphones and other mobile devices (e.g., tablets, laptops, etc.) use apps. It is clear that app development is large market with high demand.

App development has been a steadily growing industry since as early as 1970’s. John F. Clark (associate professor; University of Kentucky) explains in an online lecture that Nokia was among the first technology companies to use the app concept. Clark explains that Nokia is well-known in the technology community for putting the video game *Snake* on some of its earliest phones. Competitors followed, adding games like *Pong*, *Tetris* and *Tic-Tac-Toe* to phones. It was during this period that the first versions of apps began to appear. It was also shortly after, that a market for apps began to emerge. The rapid development of this market is made up of multiple disciplines ranging anywhere from digital graphic design to software engineering. It can be rational to attribute the wide spread of these disciplines to creating a fragmented market in app development.

App development has become one of the most fragmented markets on a global scale and the app developer community has become just as fragmented as the market. In a fragmented market like app development, developers typically collect content and small works from numerous content creators. This content is then used to develop a larger project. This is known as porting. Developers often port along a variety of platforms to get the material that they need to build an app. This is often costly and many times not straightforward.

This results in a clear divide between content creators and developers. This divide even further segments each of the groups. Content creators are segmented from other content creators competing for small works. On the same note, developers are segmented from other developers. Developers work inside different programming environments and often use different tools and programming languages in order to keep a competitive edge. In a rapid growing industry, developers often port along a variety of platforms to get the content they need for development.

With the demand for app development rising and trends varying, developers are often on a strict time budget. Fully developed apps often take 1 to 2 years to complete. This often leads to outsourcing and porting along platforms of other professionals. One platform that is a popular port in app development is content creating. This port is made up of people that provide creative content (e.g., artists & graphic

Appendix 2(3): AppTender Proof of Concept Design Document (continued)

designers). Digital graphic designers and user interface experts have become a large target group for app developers. There has been a growth in opportunities for graphic designers to produce work and even compete in events like a hack-a-thon.

After scanning discussion boards, conducting interviews and participating in hack-a-thon events, it is clear that the working relationship between developers and content creators is damaged. Numerous cases describe situations where content creators are coerced into providing sample or trial work. Some cases even describe how project interviews require content to be created without receiving any compensation. The relationship between content creators and developers is growing a strong divide. If the divide continues between these two disciplines, then the amount of innovative development and original content could significantly diminish. The market for app development will be controlled few and entry for truly innovative advancement will not be easy.

Introducing, AppTender: What is it? AppTender is a concept solution to improving the relationship between developers and content creators. AppTender would function as a subsidiary service to SketchMyApp (powered by Invasion Design oy). The concept is that AppTender would be an online environment where content creators and developers meet.

Who can use AppTender? Content creators that use SketchMyApp to create content also gain access the AppTender community. App developers can also join the community to purchase content, network with creators and explore trending content.

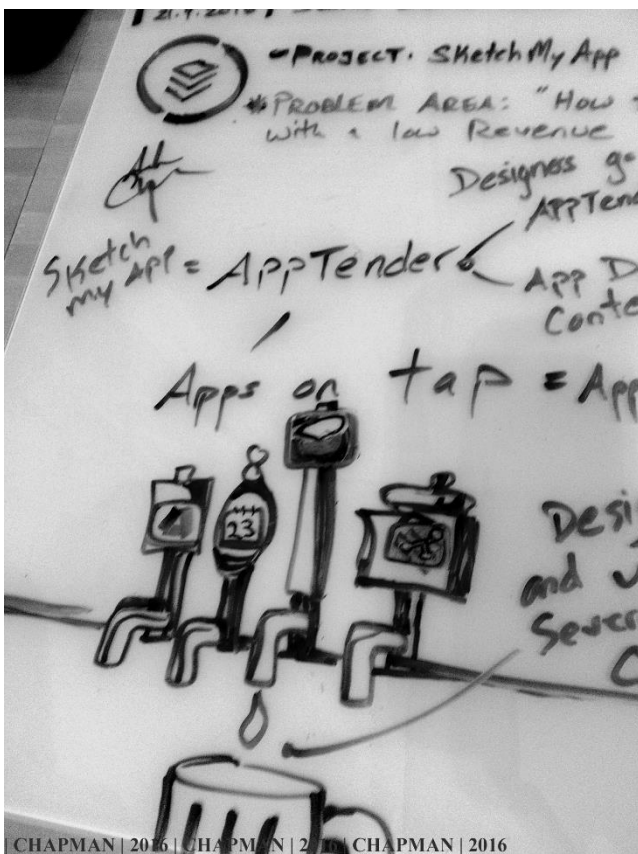
How does it work? The construct has a virtual comparison to that of a bar or a pub. For example, in a bar or a pub there is a bartender and a menu of items to select. The bartender serves customers by

suggesting items and delivering the order to the customer. In AppTender, content creators would be able to bring their content and offer it for sale or to sample. Developers and other creators can purchase a variety of content. Let's make a parallel comparison where:

- AppTender = Bar Tender
- Content = Beer
- Content Creators = Individual Breweries
- AppsOnTapp = draft beer on tap
- Developers and other creators = consumers
- Investors = Distributors

We can easily understand that content creators purchase space to sell their content to developers through AppTender.

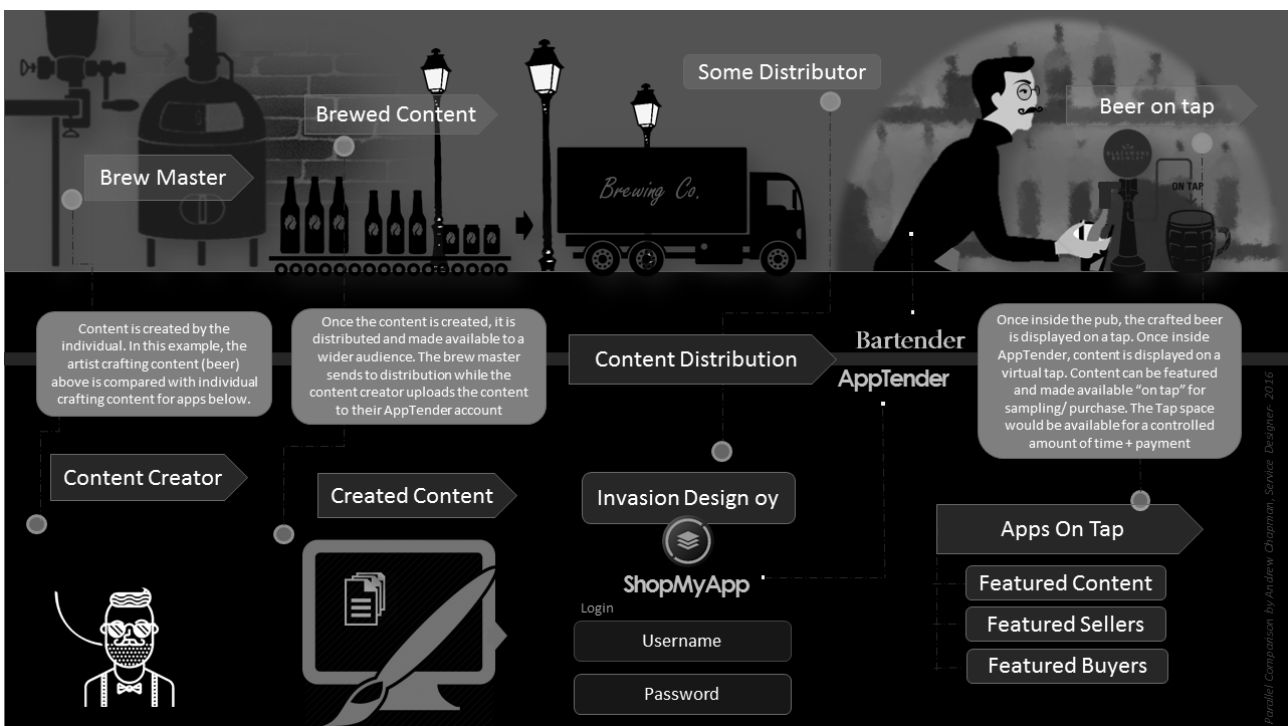
Why is AppTender necessary? AppTender is a direct solution to generate revenue from material that sells for \$1.00 to \$3.00. It is also a platform to develop a unique marketplace with a large profit potential. Like a bartender, AppTender



Appendix 2(4): AppTender Proof of Concept Design Document (continued)

would service customers with content they want and collect revenue from direct sales. AppTender also has opportunity to develop a unique marketplace and offer spaces for featured content. For example, a space called “AppsOnTap” could exist. This would provide a space where content can be featured. The name AppsOnTap is suitable for the reason that it has dual meaning. It refers to the action of tapping, which is common when using apps and also refers to a bar tap, which is used to control the release of beer (i.e., content). In a visual comparison with a bar/pub, one would see beverages featured on a tap. The same idea can be applied to the space that can be purchased by creators to have their content featured. The price for content “on tap” would be reduced to promote publicity. Invasion Design collects revenue by selling tap-space. A service like AppTender will continue to encourage the development of original content. It will also improve the relationship between at least two highly demanded disciplines.

Has this been done before? Probably, but not with these names. AppTender and AppsOnTap are unique and co-designed concepts that represent collaboration between developers and creators. Similar names exist but the service is focused on cloud-technologies like Adobe Creative Cloud and Microsoft App-V. Apps On Tap inc. is a registered organization in Ontario Canada that provides cloud-based services but does not offer an environment where content creators can sell their work for app designs. Platforms that offer a model for this type of service include Etsy, Ebay, Behance and other self-promoting virtual environments. These are all environments where creators can self-promote and network to form a customer base. None of these self-promoting eCommerce environments are purposely built to cater to the app building market. AppTender would operate as an eCommerce environment with the intention to bring developers and creators closer together.



Appendix 3(1): Version Specific Release Notes by Adobe Creative Cloud

#	Version & Release Date	Notes
36	Version 3.9.5.353 released on 12/14/2016	We've made experience improvements and bug fixes.
35	Version 3.9.1.335 released on 10/28/2016	Fixed an issue with Creative Cloud Sync on Mac OS where already synced files were getting synced again.
34	Version 3.9.0.334 released on 10/23/2016	We've made experience improvements and bug fixes.
33	Version 3.8.0.310 released on 08/30/2016	To ensure you do not miss any notification, Creative Cloud desktop app displays a red badge whenever you receive new notifications on the desktop. Click the app icon to launch Creative Cloud desktop app and view all notifications under the 'Home' tab. For more information, see Creative Cloud desktop app notification badge . This release of Creative Cloud desktop app will be the last version supported on Mac OS X 10.7 and OS X 10.8, and will not receive any further updates and security fixes on these operating systems. If you are on these operating systems, we strongly recommend to upgrade your OS so that you continue to have access to the latest versions of Creative Cloud desktop app. We've made experience improvements and bug fixes.
32	Version 3.7.5.291 released on 07/20/2016	We've made experience improvements and bug fixes.
31	Version 3.7.0.272 released on 06/13/2016	Notification for limited access to Adobe apps or services and help for fixing the issue. Other bug fixes.
30	Version 3.6.0.248 released on 04/12/2016	We've made performance improvements and bug fixes related to user experience and reliability. Acrobat DC download and installation is enhanced to support already-installed versions of Acrobat.
29	Version 3.5.1.209 released on 2/14/2016	Fixed an issue in the Creative Cloud for desktop app for Mac where in some scenarios the application may incorrectly remove files with user writeable permissions from the system root directory.
28	Version 3.5.0.206 released on 2/11/2016	A new Manage Account menu option allows you to access and manage your Adobe account easily. Other bug fixes.
27	Version 3.4.3.189 released on 12/21/2015	A bug that caused Creative Cloud for desktop to crash on launch was fixed. This update is not installed automatically. You can download it from https://creative.adobe.com/products/creative-cloud
26	Version 3.4.2.187 released on 12/11/2015	A bug in Creative Cloud processes was fixed to address a 100% CPU usage on Mac OS.
25	Version 3.4.1.181 released on 11/26/2015	A new Check for App Updates menu option retrieves the latest updates for your Creative Cloud applications without waiting to refresh Creative Cloud for desktop. We've made performance improvements and bug fixes related to user experience.
24	Version 2.3.0.151 released on 9/24/2015	This update brings in significant improvements in the installation experience: Processes that conflict with the installation of products are shown before the download starts. What's more, the notifications about the conflicting processes are much more helpful. Acrobat DC download and installation is enhanced to support already-installed versions of Acrobat. If you change your subscription, the Creative Cloud desktop app now displays your current entitlement status for each app. HiDPI support on Windows is added. Adobe Software integrity Service is integrated in this update. Other bug fixes.
23	Version 2.2.0.129 released on 7/27/2015	The Creative Cloud desktop app is now compatible with Windows 10. Note the following: Customers with Microsoft Enterprise Data Protection should use the CCE Public Encryption feature. Windows customers who are missing notification icons after updating can resolve the issue by restarting their system. An auto-update error was fixed. Additional bug fixes have improved the overall app experience.
22	Version 2.1.3.121 released on 7/7/2015	Creative Cloud desktop app no longer pops up in the middle of your workflow. The Exchange plugin will now correctly install Adobe Add-ons. Additional bug fixes have improved overall experience.
21	Version 2.1.1.110 released on 6/14/2015 and updated on 6/15/2015	The latest 2015 releases of Creative Cloud applications are now available. Creative Cloud for desktop now preserves preferences and settings when you install updates – and you can remove, keep or install current and previous releases of your applications. A new Adobe Stock panel has been added, giving you access to millions of high-quality, royalty-free photos and graphics. Individual panels, including the desktop applications panel, load even faster. We've made error messaging more self-evident. Bug fixes have improved overall experience.
20	Version 2.0.1.88 released on 5/7/2015	Reduced update log file size- Performance improvements
19	Version 2.0.0.74 was released on 4/21/2015	We've made performance improvements and bug fixes related to user experience.
18	Version 1.9.1.474 released on 4/02/2015	Creative Cloud for enterprise customers can now access Adobe Experience Manager Assets (Marketing Cloud) from within the Creative Cloud desktop app. We've made performance improvements and bug fixes related to accessibility, licensing, and more. This update is now mandatory for all customers.
17	Version 1.9.0.465 released on 1/13/2015	The Creative Cloud desktop manager app detects and downloads updates, automatically. Uncheck the box to turn it off. (Applies to only the Desktop Manager app.) Sync Files and Fonts faster and seamlessly—even when switching between Internet connections. The Typekit font service now defaults to "on", so your fonts sync easily and automatically without having to set Preferences. We've decreased average load time for the Apps panel so you can get to work faster. Employees can sign in conveniently and securely using their company's identity management system and an Enterprise ID. (Applies to Creative Cloud for enterprise customers.) To see what's new in the October 6, 2014 updates to Creative Cloud, visit the Creative Cloud site .
16	Version 1.8.0.447 released on 10/6/2014	Quickly launch apps with one click—and safely uninstall apps—from one central place in the Apps panel. Save battery life via improved app efficiency. Save Creative Cloud Market assets into our new multi-application Creative Cloud Libraries. Search Creative Cloud Market using Japanese keywords. Take advantage of OS X Yosemite compatibility. Troubleshoot file sync issues via more specific error messages. Mask services in the desktop app that aren't available to your users (applicable for Creative Cloud for enterprise customers). Japanese version only
15	Version 1.7.1.418 released on 7/24/2014	Reduced unnecessary internet requests during file sync failures. Fixed issue where paid members were seeing "Try" instead of "Install" when running for more than 24 hours.
14	Version 1.7.0.413 released on 7/3/2014	Introducing Creative Cloud Market – a selection of useful content licensed for paid Creative Cloud members, including vector objects, icons, patterns, and placement images. Restructured navigation with Fonts and Files now under the new Assets tab. Apps panel updates for simplified experience around Creative Cloud apps installation. File sync now turned on by default. Performance and stability improvements for file sync and collaboration, including the ability to manage separate identities on a single desktop. Latest build of Lightroom is now available to free members. Removed repetitive OS notifications that require admin privileges for Add Ons. Increased number of files supported in a given file sync folder. Improved error handling to show multiple OS notifications of file sync errors as a single notification. Fixed errors for pending file and font sync operations when quitting application. Eliminate erroneous file sync of .tmp files, including Adobe After Effects CC temporary files. Quicker file sync response to going back online after being offline on Mac. Improved error handling of virus infected files for file sync.
13	Version 1.6.0.393 released on 05/27/2014	You can now install older versions of Adobe products straight from Creative Cloud Desktop. These are installed side-by-side with existing versions. Improved performance when syncing a large number of files. Fixed scenarios where font sync would show perpetual spinner. Improved overall font sync stability. Improved error handling for file sync, including the addition of notifications when retrying can resolve an error. Batched notifications of file sync operations, limiting the number of notifications when a large number of files are synced in a short period of time. Redesigned Sign In experience. Increased types of enterprise identities accepted for licensing products.
12	Version 1.5.1.369 released on 3/21/2014	Fixed a bug in Creative Cloud desktop application install process on 64-bit Windows systems that resulted in a missing msvcp110.dll error message when launching some CC products.

Appendix 3(2): Version Specific Release Notes by Adobe Creative Cloud (continued)

#	Version & Release Date	Notes
11	Version 1.5.0.367 released on 3/19/2014	Fixed multiple Creative Cloud desktop app download failures. Updated installation error messages for better comprehension. Usability improvements to the Creative Cloud desktop app update workflow, including the ability to defer non-critical updates. You can also see what is included in an update before you install it. This version deploys these improvements, which will then appear for all future Creative Cloud desktop app updates. Made minor usability improvements for product update workflows and Home panel notifications. Improved reliability for file synchronization, including the ability to cancel upload or download operations until synchronization is complete. Also includes elimination of known memory leaks. Improved file synchronization error handling for full local disk drives and locked files. Implemented minor security enhancements.
10	Version 1.4.1.351 released on 2/12/2014	Fixed bug for non-administrator Mac OS X users that resulted in termination of various applications. Bridge CC, Edge Inspect CC, Adobe Media Encoder and Scout CC terminated upon launch. Premiere Pro CC terminated upon export of file. Correctly set access privileges on "~/Library/Preferences/Adobe" folder on Mac OS X so that the current user has read/write access.
9	Version 1.4.0.348 released on 2/03/2014	Enabled access to already synchronized Typekit fonts after going offline. Improved performance and reliability of file synchronization. Improved error handling when file synchronization fails. Fixed links to tutorials in unsupported languages so that users are directed to English version of tutorials.
8	Version 1.3.0.322 released on 12/19/2013	Improved performance of Typekit Font Sync. Enable/disable font sync in the Preferences Pane. Install latest feature updates at initial install time for free Creative Cloud members. Support for product names requiring two or more lines of text in the Apps panel- Links to product tutorials for CC Apps in the Home and Apps panel- Eliminate ACC install time conflicts with CEPServiceManager so that ACC updates and installs are more likely to succeed. Fixes to the install workflow when launched from Internet Explorer 11 on Windows 8.1. Fixes to the file synchronization workflow, including fixes for iWorks application crashes and crashes on the Mavericks OS.
7	Version 1.2.1.260 released on 11/6/2013	Bug fixes for critical licensing failures- Windows 8.1 critical compatibility fix
6	Version 1.2.0.248 released on 10/28/2013	Much higher reliability for file and font synchronization through improved handling of sign in tokens across panels. Paid users get the latest update of a product applied when first installing the product. Trial users have access to updates with features in them. Compatibility fixes for Windows 8.1 Ability to minimize ACC while in Window mode. Ability to download and install Lightroom 5.2 in previously unavailable locales. Fixed cases where Home panel spinner remained spinning indefinitely and CPU utilization was high resulting from having no notifications. Performance improvements in loading Behance panel. Improved error handling in multiple areas when the sign in credential's device token expires. Fixed errors when synchronizing Adelle Sans Italic font. Fixed case where font panel spinner remained spinning indefinitely due to turning on and off font sync while synchronizing a font. Windows 8.1 fix to properly restart Explorer after installing ACC. Fixed ACC install problems resulting from earlier version (AAM) update notification process running. Allow internet connection with Windows systems using a PAC file for automatic proxy configuration. Fixed case where illegal characters in a synchronized file name resulted in user being taken to incorrect cloud location. Fixed cases where product is shown as up to date after an update installation fails. Fixed translation problems in multiple languages by moving to newest Adobe Clean font. Fixed cases where error icon is displayed on the task bar when signed out after font synchronization error. Fixed incorrect version number in Mac's About dialog. Include link to customer support URL for system errors.
5	Version 1.1.2.232 released on 9/4/2013	Fixed errors during install of Adobe Creative Cloud desktop application due to OS locks on installer backup folders. Improvements to the Adobe Creative Cloud desktop application's install workflow, including performance optimizations and better handling of elevation to OS administrator privileges. Fixed memory leaks with OS notification activity. Improved performance for loading Behance panel content. Fix for synchronized fonts to correct some incomplete font activations scenarios that resulted in synchronized fonts being unavailable for use. Fix to disable fonts when no user is signed into the Adobe Creative Cloud desktop application.
4	Version 1.1.1.220 released on 8/20/2013	Fixed cases of unexpected conflict and copies created from previously synchronized files. Fixed cases of unexpected deletion of files previously synced from the Creative Cloud Connection Preview application. Fixed some cases of fonts synchronized when user is signed out later become unavailable.
3	Version 1.1.0.213 released on 8/8/2013	Adobe CEF Helper (used to display web content) no longer utilizes CPU when not in use. Enablement for Early Access release of Font and Typekit File Sync (learn more).
2	Version 1.0.2.189 released on 7/15/2013	You can access the Release Notes from Preferences > General > Account > Version #. The Creative Cloud application no longer shows a confirmation message when you shut down the app. (Mac OS only) App no longer opens when you switch between Spaces. (Windows only) By default the app now launches in Window mode instead of pinned to the System Tray.
1	Version 1.0.0.183, released on 6/24/2013	General performance improvements, including during sign in and authentication. Resolves an issue where some users encountered an "Unknown Server Error" when attempting to sign in.

Appendix 4(1): Service Design Activity and Project Log

Date	Task	Description
June 2016 12-18	software setup, account(s) set up, User Journey Map Doc., preliminary project planning, software trouble shoot *setup, user experience mapping, persona building, software trouble shoot *setup, document process (text), Successful launch to desktop, Unsuccessful connect to device	Troubleshoot with IT to install Creative Cloud (meeting with Toni 15.6.16 Create accounts with #Slack, Adobe ID, Dropbox Install sketchmyapp prototype app to mobile device (ipad). Continued troubleshooting with IT collected available tutorial information unsuccessful in installing Photoshop addon (adobe web page loads blank after install command) Begin mapping + Personas
June 2016 19-25	AppTender conceptualization, Develop PSD app design, Sketchmyapp Designer crash, user studies, forum prospecting, Benchmark tutorial methods, tutorial research, voice over / edits, pilot video sample rendered, Meeting, tutorial editing (0.1 1st tut.).	Concept visualization and text description draft begin PSD template conversion to SMA design for tutorial build layers for design trouble shoot SMA Designer crash. Plugged online discussion boards and linkedin group discussion- cold msg to profiles specific to graphic design, photoshop and app dev. photoshop art created, adobe premiere folders created, began creating material for tutorials (audio, graphics).
June 2016 26- July 2	download portable app launch & install screen recorder, capture 0.1 tutorial, 0.1 tutorial screen recording, Adobe Premiere editing, Document transition notes, re-capture transition steps, comparison btwn sample + live, Record audio, edit audio, Render + export clips, Upload to slack, troubleshoot adding transition, edit audio, edit video	Desk research to find programs for screen recording install portable app launcher to external drive, install app to external drive and run screen capture to collect footage from photoshop. capture steps- opening SMA, Opening SMA Designer Window, Displaying Designer Window, opening tutorial sample, selecting documents, refreshing Designer Window, adding basic transition Render + export. analysis of users' text language and interface for adding transitions record screen for tutorial (basic transitions)
July 2016 3-9	Tutorial material update, CEO Meeting, update psd, conversion, practice with adding transition	Journey mapping, result > discovered dead link to Slack (see https://sketchmyapp.slack.com/files/andrew/F1NGMDVC3/slack_dead_end.png). Meeting with CEO, discussed new UI for transitions, discussed current progress and received feedback for tutorial development
July 2016 10 - 16	sample psd conversion, document review, content design PSD, content design PSD cont.	Added new layers and groups for button transitions with micro interactions reviewed LEARN docs. available on SMA site. PSD sample conversion for tutorial material, screens 2,3,4 added new layers and groups for button transitions with micro interactions. Continued PSD sample conversion for tutorial material, screens 2,3,4 added new layers and groups for button transitions with micro interactions
July 2016 17-23	user studies	Attempted user interview, user stated they were proficient with Photoshop, however observation revealed that user demonstrated new to basic skill level.
July 2016 24-30	user studies, face to face, user studies report (full text doc)	Set up interview for observing real-time (face-to-face) onboarding process with new user. documented event and conducted post event interview to gain user's insight/ experience
Aug 2016 7-13	Report Doc. Qualitative analysis, user studies, meeting with IT, PSD edits Tutorial Scripting, transition learning, x2 Meeting with IT, user studies	see User Study REPORT met with IT to update software. Reviewed PSDs for updated tutorials made slight wording changes updated onboarding tutorial script, began voiceover recording. Continued to script and record tutorial voiceovers explored transitions and interactions. fished digital design forums and plugged questions about how to use SMA // followed up with participant testing onboard process, shared new updates and discussed others


Appendix 4(2) Service Design Activity and Project Log (continued)

Date	Task	Description
Aug 2016 14-20	Onboard Tutorial edit	Refined journey map and user process for onboard capture raw footage Adobe Premiere Pro visual edits, render and sample export. Adobe Premiere Pro visual edits, render and sample export. Build Intro, build Outro
Aug 2016 21-27	Meeting with CEO, adjust recording settings, total uninstall, capture raw footage, convert and import footage, build visuals. imported and converted new footage	Hardware set up discussed tutorial content and proceedings (10:00-10:40am) adjusted settings and uninstalled software for video recording. Captured and converted VP8 to MP4 for editing built tutorial menu art and foot text. Rough cuts and fine cuts for video edits including rendering and color enhancements. Live user testing with onboard and small group feedback.
Aug 2016 28- Sept 3	LinkedIn post, software research, search screen recorder, Find and install broadcaster, adjust sequence settings, capture raw footage, Isolated Audio, create content and visuals, import audio, match audio to video, render and export	Posted a discussion topic in UI/UX Design group asking what some favorite free and paid app dev. software Sampled screen recorders by uninstalling SMA package, Photoshop and Creative Cloud desktop app and capturing onboard process (repeat several times). Edit new raw footage from broadcaster screen recorder, added old audio at intro and outro, rendered, exported at max quality. Edit new audio and match to video max render depth and export with new edits File: 2-G170OnBoard_Tutorial_audio_incomplete. Onboard Tutorial 3.0 enhanced audio capture, re-record intro, linking account,
Sept 2016 4-10	PSD edits, Parallel comparison AppTender, Create parallel BM comparison AppTender concept	PSD conversion to AppTender visualization with SMA properties and values set (scrollable content). Concept visuals for POC doc image. PSD conversion to AppTender visualization with SMA properties and values set (scrollable content) + concept visuals for POC doc image v.2.
Sept 2016 18-24	User studies, 1:1 assistance with onboard, capture new footage small premiere edits, raw audio capture, isolated audio recordings, AppTender Doc writing	Small group discussion with digital design student volunteers to test onboard process. x2 students with tutorial, x2 students without. All students savvy with Photoshop. Follow up discussion from events yesterday. Students gave verbal feedback and reported that they think the video was a "huge help" but they still all agree the process is very long. Revised proof of concept (POC) doc
Oct 2016 2-8	write and record script for tutorial guides	Captured raw footage opening tutorial SMA in Ps and testing demo designer window. Multiple crashes with designer window and recorder
Oct 2016 9-16	tutorial edits audio + video, Ps Design content, Tutorial audio fix	uploaded and re-edited tutorial. Built information screens artwork in Ps for basic content and layer structure re-recorded audio clips.
Oct 2016 16-22	concept dev., UX visualization	Pitched Transition Library as software improvement and discussion with CEO via slack
Oct 2016 23-29	user onboard assistance, direct user contact / research	Onboarded user in Texas and discussed potential uses (user expressed interests in creating poetry in motion)
Oct 2016 30 - Nov 5	UX research, Text revisions	Doc. Text dissection (Actions and Events) made suggested improvements based on user suggestion (Texas)
Nov 2016 6-12	Ps content creating, edu. self on software jargon for tutorial vid.	Created photoshop content for information screens and recorded footage for info screen_Tutorial_adding micro interaction. ux breaking down events and global events.

Appendix 4(3): Service Design Activity and Project Log (continued)

Date	Task	Description
Nov 2016 13-19	user studies, Adobe Premiere editing, audio capture raw, Tutorial design, Tutorial edits, created Ps content, user studies, UX research	Discussed updates with x1 user, we discussed the learning curve and time being a constraint. Basic Move to page content, recorded footage, audio and created info screen stills for tutorial. Received referral for x2 interested users from Vermont-USA. x2 students enrolled in digital media and graphic design program
Nov 2016 20-26	Tutorial edits (audio), Began video edits, user studies, Tutorial edits (interactions)	Wrote and recorded scripts for Interaction Tutorial. Began video edits. Followed up with x1 new user from VT USA, introduced to main website, provided direct contact via andrew@sketchmyapp.com and extended invite to service design Slack
Nov 2016 27 - Dec 3	Attend Microsoft Accelerator Bootcamp, Attend Slush 2016, network and scout potential user interviews	lecture intensive topics covered: Validating your idea Finding your customers positioning for success, hiring A-team, startup ecosystems, finding and using local resources, Harnessing the power of social, Focusing on growth, Networking the force multiplier, setting target markets, Navigating legal world 60 second pitching. Spoke with MF CEO at Bryom may be interested in app dev software and LEAD for app dev company providing software for smartwatch alarm system.
Dec 2016 4 - 24	Tutorial edits	Place raw edits, cut and trim. Troubleshoot Tutorial PSD not loading. Scripting capturing audio and begin editing total tutorial v1.0, re-record audio start to finish, edit and update sections (scaling, adjusting designer window, optimal scaling). New tutorial, master tutorial segments from tutorial psd. Made contact with new users via slack. No response by slack and sent direct messages to x5 potential users (PS power users/ certified)
Jan 2017 15- 31	Total tutorial edits	Video capture New tutorial, total tutorial segments from tutorial psd. Trouble shoot settings for video capture, software update- New tutorial, master tutorial segments from tutorial psd. Video RE-capture total tutorial, total tutorial segments from tutorial psd. Trouble shoot and script Total Tutorial project. Learn and rebuild pages 1-5. Learn and build animations tutorial page 5 and 6. Capture raw footage on Total tutorial project. edit footage capture (40:40) of Total Tutorial project and begin voice over raw capture audio
Feb 2017 1-4	Scripting, Final export, render, distribute (to CEO)	Scripting editing total tutorial v1.0, re-record audio start to finish, edit and update sections (scaling, adjusting designer window, optimal scaling). Scripting editing total tutorial v1.0-smart content, adding smart content links, animation and web info explanation- captured and edited bonus micro interaction MTP ontap3. render, export, review and describe user insight dev opportunities
End Project		



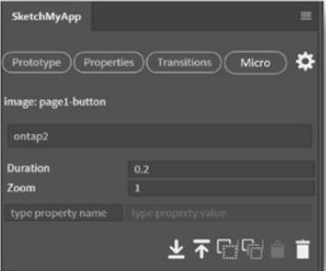

Appendix 5: Dev-Opps Document for Improved User Experience



sketchmyapp

Dev Opps based on user insights, design thinking strategy and user-centric service design. Doc author: Andrew Chapman, Service Designer

2.2.2017

Development Opportunities	Description								
<h3>Designer Window</h3> <p>Frustrated by having to restart the designer window every update in PS/ SketchMyApp. Cannot test recent current change, must begin from the beginning</p>	<p>Integrate keyboard controls and make them available to users. I discovered that ctrl+T resets the designer window and ctrl+R returns to the start but I'm not 100% sure what these keyboard shortcuts do</p> <p>Integrate small control menu with a back feature so users can repeat test</p>								
<h3>Micro-Interactions</h3> <p>Users cannot set a micro-interaction after setting a move to page tap action preset.</p> <p>Or add a "micro" tab</p> <p>To house all micro interaction presets</p>	<p>Allow element transitions to occur before move to page actions:</p> <div style="display: flex; align-items: flex-start;"> <div style="margin-right: 10px;"> <p>Element Transition</p> <p>1</p> </div>  </div> <div style="display: flex; align-items: flex-start; margin-top: 10px;"> <div style="margin-right: 10px;"> <p>Element Properties</p> <p>2</p> </div>  </div> <div style="margin-top: 20px;">  <div style="position: absolute; top: 0; right: 0; font-size: 2em; font-weight: bold;">NEW</div> </div>								
<h3>True & False</h3> <p>Design language vs. programming language</p> <table style="margin-left: auto; margin-right: auto; border: none;"> <tr> <td style="padding: 0 10px;">True</td> <td>False</td> </tr> <tr> <td style="padding: 0 10px;">Yes</td> <td>No</td> </tr> <tr> <td style="padding: 0 10px;">On</td> <td>Off</td> </tr> <tr> <td style="padding: 0 10px;">Let's do it.</td> <td>Let's not.</td> </tr> </table>	True	False	Yes	No	On	Off	Let's do it.	Let's not.	<p>Recommended to use alternatives to true and false to reduce confusion</p> 
True	False								
Yes	No								
On	Off								
Let's do it.	Let's not.								

Appendix 6: Implemented Learning Service [Video File 1]

- Video title: **3.1-Onboard tutorial.mp4**
- Length: 00:05:30
- Created: September 5, 2016

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Contact Andrew Chapman for access to this video file.
Please include appendix number and video title.
Email: andrew.chapman@edu.turkuamk.fi
Alt. email: andrew@apchapman.com

Appendix 7: Implemented Learning Service [Video File 2]

- Video title: **Build basic content with layer structure tutorial.mp4**
- Length: 00:04:41
- Created: November 16, 2016

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Alt. email: andrew@apchapman.com

Appendix 8: Implemented Learning Service [Video File 3]

- Video title: **Setting move to page action tutorial.mp4**
- Length: 00:05:04
- Created: November 17, 2016

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Alt. email: andrew@apchapman.com

Appendix 9: Implemented Learning Service [Video File 4]

- Video title: **Total tutorial v1.0.mp4**
- Length: 00:18:02
- Created: January 31, 2017

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Alt. email: andrew@apchapman.com