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Strategies That Improve UX (User Experience) Design Through Product Innovation

Jibing Zhao
Walden University

Walden University

College of Management and Technology

This is to certify that the doctoral study by

Jibing Zhao

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Review Committee
Dr. Diane Dusick, Committee Chairperson, Doctor of Business Administration Faculty

Dr. Kevin Davies, Committee Member, Doctor of Business Administration Faculty

Dr. Kim Critchlow, University Reviewer, Doctor of Business Administration Faculty

Chief Academic Officer and Provost
Sue Subocz, Ph.D.

Walden University
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Abstract

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Doctoral Study Proposal Submitted in Partial Fulfillment

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Abstract

User Experience (UX) design improvement can alter business results. Information technology (IT) company leaders are concerned with UX design improvement, as it is the number one indication of product innovation success and user satisfaction. Grounded in Christensen's disruptive innovation theory, the purpose of the qualitative single case study was to explore strategies IT company leaders and UX designers used to identify critical UX design elements that lead to improved product innovations. The participants were five IT company leaders and a focus group of four UX designers employed by a sizeable telecom organization in Beijing, China. The data were collected from five semistructured interviews and the focus group discussion. Through thematic analysis, five themes emerged: cultivate a user-centered company culture, improve UX design basic factors, focus on the users, measure UX design key performance indicators, and optimize the UX design process. The primary recommendation is for business leaders to cultivate a user-centered culture through building a user-centered belief across the organization and reaching support from the senior management. The implications for positive social change include the potential to develop useful products that may help users solve real-life problems and enhance their quality of life.

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Dedication

I dedicate this doctoral study to my parents, Hehui and Huaying.

Acknowledgments

This doctoral study would not have been possible without the continuous support that I received. First of all, I wish to thank my doctoral committee members for their specific and professional guidance and advice throughout this doctoral process. I extend my appreciation and thanks to my committee chairperson, Dr. Diane Dusick and my second committee members, Dr. Land Denise and Dr. Lisa Pearo, for their professional input including encouragement, mentorship, inspiring feedback, guidance, and support, which significantly contributed to my success. I also wish to thank Dr. Kim Critchlow, the university research reviewer, for reviewing my study and ensuring that it adhered to the university's requirements.

I wish to thank my other family members and course fellows for their kind support, assistance, and encouragement during my time at Walden University. To my course fellows, I wish all of you success in completing your own studies.

I also want to thank my friends who inspired and supported me along my DBA journey.

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Section 1: Foundation of the Study

In the first section, I explored the user experience (UX) design improvement strategies that IT company leaders used to improve product innovation by first presenting the background of the problem, the problem statement, and the purpose statement. I outlined the nature of the study by specifying the research and interview questions. I also explored the conceptual framework, the significance of the study, and reviewed the academic and professional literature pertaining to the disruptive innovation theory and the strategies for improving UX design for product innovation.

Background of the Problem

Improving UX design is the central focus for product innovation. UX design refers to the process that provides meaningful and relevant experiences to users by enhancing customer satisfaction and loyalty and improving the usability, ease, and pleasure in the interaction between the user and the product (Dove et al., 2017). Integrating UX design with product innovation continues to be the subject of academic studies and practitioner discussions (Kim et al., 2020). Over the past decade, UX design has surged rapid changes and socioeconomic transformations in consumer electronic domains (Lauer & Brumberger, 2016). According to Pugliese et al. (2018), Twitch's game platform designers focus on UX design in their video game live streaming, including esports events like massive competitions to improve customer satisfaction. At Duolingo, keeping everything simple by asking one question at a time is the principle of UX design to maintain clarity and reduce the cognitive load (Ballew et al., 2020). An online questionnaire given to 500 UX practitioners and their organizational leaders within

Europe, North America, and Northeastern Asia revealed that product development with the end-user in focus became the key to design success (Shin et al., 2017). Optimizing UX design for product innovation has become a critical design activity in attracting users (Lauer & Brumberger, 2016). The same was the case for IT companies. IT company leaders needed to augment the UX design through the UX design strategies as well.

As the users' satisfaction was the ultimate target of the product strategies, IT company leaders must improve proper UX design according to the users' needs. For example, IT company leaders emphasized the information architecture (IA) and the graphical user interface (GUI) of a product. Both IA and GUI design supported the look and feel of the product that the user interacts with to increase the usability (Maloney & Bracke, 2017). The strategies that IT company leaders used to improve UX design were increasingly important for product innovation success.

Professionals and experts in the UX field realized the importance of UX design strategies for product innovation. The effect of improving UX design in product strategies was so vital that the User Experience Professional Association (UXPA) and the Society of Technical Communication (STC) created a UX design committee to explore and examine UX design trends and how IT company leaders respond to those trends (Tullis, 2019). However, the existing research on the practical business application of UX design strategies was limited (Pennington et al., 2016). The purpose of this study was to explore this gap in research and practice on the strategies that an IT company's leaders use to improve UX design effectively in product innovation.

Problem Statement

Improving UX design is a pivotal enhancement for product innovation and user satisfaction (Dove et al., 2017). Murakami and Koyanagi (2017) noted that 100% of the delta design maps (14 of 14) with a focus on improving UX, function, behavior, and structure through product innovation fostered recognized value creation for end-users. The general business problem is product innovation proposals without a focus on critical UX design are less likely to satisfy users. The specific business problem is some IT company leaders lack strategies to identify the critical UX design elements for implementing effective UX design solutions to improve product innovations.

Purpose Statement

The purpose of the qualitative single case study was to explore what strategies the IT company leaders and UX designers used to identify the critical UX design elements and for implementing effective solutions to improve product innovations. The target population of the study was five IT leaders from a company in China whose departments use effective UX design strategies to improve product innovations. Also, selected from a different talent pool, I organized and conducted a focus group with four UX designers from different UX design teams in the same company to provide additional information for methodological triangulation. Implications for positive social change included the potential to increase the sustainability of businesses through eliminating unnecessary costs, reducing employee exhaustion, increasing job opportunities, incomes for employees' families, and tax revenues for communities. Further implications for positive

social change included fostering product usability, improved quality of life, and creating new products and new occupations for advancing the economic betterment of societies.

Nature of the Study

The three research methods I considered were qualitative, quantitative, and mixed methods (Yin, 2017). Qualitative researchers use open-ended questions to discover what is or has occurred (Spiers et al., 2018). Guetterman et al. (2015) indicated that the qualitative method leads to a high degree of subjectivity as researchers collect and analyze data from the knowledge and experience of participants. In contrast, quantitative researchers use closed-ended questions to test hypotheses about variables' relationships (Yin, 2017). Mixed methods research includes both a qualitative element and a quantitative element (Guetterman et al., 2015). I used the qualitative method to retrieve data to collect the participants' understanding of the research topic and address the research problem. I was not testing hypotheses through a quantitative study or the quantitative portion of a mixed-methods study to explore strategies used to improve UX design for product innovations.

I considered three qualitative research designs for identifying and exploring strategies the company uses to improve UX design innovations: (a) miniethnography, (b) narrative design, and (c) case study. Miniethnography involves the study of a group, a community, or a subculture for the information of the status quo (Fusch, & Ness, 2017). Because the purpose of the study was not to explore a community or culture, a miniethnographic design was not suitable for my research. A narrative design entails collection, analysis, and description of a person's life (McAlpine, 2016). I did not choose

the narrative design as collecting and analyzing personal stories are not the appropriate focus for this study. Researchers use phenomenology to describe and interpret the personal meanings of participants' lived experiences regarding a specific phenomenon (Guetterman et al., 2015). Because the personal meanings of participants' lived experiences are not related to the purpose of the study, phenomenology is not an appropriate design.

Researchers conduct an in-depth, detailed case study of a small group of individuals through interviews or questionnaires with secondary data such as supporting documentation review (Spiers et al., 2018). Researchers use a single case study to explore a real-life phenomenon in-depth, especially when the phenomenon boundaries and context are blurry (Yin, 2017). Multiple case study is a research design that includes at least two observations of the same phenomenon from different distinct cases (Gustafsson, 2017). I preferred a single case study over a multiple case study, as I had chosen to focus on a group of participants from one IT company in Beijing. Using the single case study allowed me to explore an in-depth understanding of what strategies the leaders use to improve UX design for product innovation in this company. I conducted a qualitative single case study for this research.

Research Question

What strategies do the company's IT company leaders and UX designers use to identify the critical UX design elements and implement effective solutions to improve product innovations?

Interview Questions - Leaders

1. How have you aided your organization in improving its UX design for product innovations?
2. How do you measure improvements in UX design?
3. How did your organization address the key barriers to improve your UX design elements for product innovations?
4. What strategies were least effective to improve your UX design for product innovations?
5. What, if any, modifications did you apply to any strategy to improve your products' UX innovation strategies?
6. Based upon your experience within your organization, what design strategies did you find worked best to improve your UX design for product innovations?
7. What else would you like to share with me about your organization's strategies for improving your UX design for product innovations?

Interview Questions – Designers

1. What was your feeling about implementing organizational strategies for improving UX design through product innovation?
2. How have you improved your UX design for product innovations in your work?
3. What design process modifications have fulfilled the need to implement UX design strategies?

4. Based on your experiences, what design methods or tools have worked best for improving UX design for product innovation?
5. During your assignment to implement the UX design strategies, how have you addressed the key barriers or problems in implementing the strategies?
6. What additional information would you like to share about the processes and tools you've employed for improving UX design for product innovation?

Conceptual Framework

The basis of the study was the disruptive innovation theory created by Christensen in 1997. Disruptive innovation theorists propose producing more straightforward products in moderate niche target markets and for limited gross margins (Christensen, 1997; Reinhardt & Gurtner, 2018). Disruptive innovation theory describes an innovation process for a product from an embryonic chosen market, steady growth in the market, and when the product eventually becomes the substitute for established market-leading competitors (Christensen, 1997). During the disruptive innovation process, a higher level of risk of misguidance from business leaders could affect product success (Christensen et al., 2016). Because the purpose of UX design is to innovate products to provide meaningful experiences for the product's users, including the product's branding, purpose, usefulness, and function (Pennington et al., 2016), leaders can misjudge the users' needs and incur new product design and development projects' failures. IT company leaders need appropriate strategies for mitigating misjudgments and ensuring the success of new design projects. The tenets of disruptive innovation theory coincide

with the goals of UX design, making it an appropriate framework for identifying the desired strategies for improving UX design for increasing product innovation success rates.

Operational Definitions

Graphical user interface (GUI): GUI is an interface through which a user interacts with electronic devices or applications, such as computers, hand-held devices, and software that runs on the hardware platforms (Kim et al., 2017).

Human-Computer Interaction (HCI): HCI is a methodology of a multidisciplinary field that focuses on the design of computer technology and the interaction between humans and computing devices, or with other forms of information technology design (Rautaray & Agrawal, 2015).

Information architecture (IA): IA is an important skill and discipline, such as content strategy, technical writing, graphical scheme, library science, and interaction design to concentrate the design for end-users, which contains the focuses on how to organize, structure, and present the understandable information to users (Maloney & Bracke, 2017).

Usability evaluation: Usability evaluation is the process of focusing on how users learn and use a product to achieve the intended goals (Deng et al., 2017).

User-Centered Design (UCD): UCD encompasses human interaction principles with the computer for end-users, and the UCD concept contains the usability evaluation and the information architecture (Deng et al., 2017; Sundt & Davis, 2017).

User Experience (UX) Design: UX design is a method to improve customer satisfaction and loyalty through the utility, usability, and pleasure provided in the interaction with a digitalized product or service (Dove et al., 2017)

Assumptions, Limitations, and Delimitations

Assumptions

An assumption refers to the researchers' beliefs of a study that are unexamined (Marshall & Rossman, 2016). Researchers must disclose the assumptions as the assumptions can affect research decisions and the reader's perception of the study (Bengtsson, 2016). This study contains several inherent assumptions. First, I assumed that the selected qualitative design would be appropriate for exploring the research questions. Second, I assumed that all IT company leaders or UX design experts would be actively involved in organizational UX design activities. Third, I would ensure the participants' privacy and confidentiality in the research, so I assumed that the participants would respond to all interview questions with honest and truthful answers.

Limitations

The researcher must identify the limitations of a study (Marshall & Rossman, 2016). The limitations are the obstacles of the study, which refer to the potential and uncontrollable weaknesses in the study (Bengtsson, 2016). Three primary limitations pertain to this study. First, the qualitative descriptive approach might limit the nature of the information shared by the participants during the interviews (McCusker & Gunaydin, 2015). As an example, the participants might choose to share only part of the information and hide other information that they considered to be easily identifiable by the

interviewers. Second, a qualitative interview is a creative method that includes open-ended questions to reach detailed responses. Several factors can influence the accuracy of the answers. For example, participants might choose to be dishonest to disclose information that they feel the interviewer desires to hear; therefore, the response would not be accurate. Third, the small sample size of IT company leaders and UX designers from a single company limits the generalization of this study. The findings may not apply to a larger population because the participants involved only a small population, within one company as the unit of study in a single industry.

Delimitations

Delimitations are factors that limit the scope of research, which is controllable by the researcher (Bengtsson, 2016). A primary delimitation for this study included the purposeful selection of the participants. To narrow the scope, participants must be IT company leaders or UX design experts, who must come from the Beijing economic region. The second delimitation was the small sample size of five IT company leaders and four UX designers who a sizeable telecom organization employed. The IT company leaders needed to create and use UX strategies for product innovation. The UX designers needed to be implementing the UX strategies for product innovation. Another delimitation of this study was that my personal interests might limit the scope of questions regarding UX design strategies for product innovation that I asked in the interviews.

Significance of the Study

The envisioned study contained implications for practical business strategies and social change. UX design for product innovation is one of the fastest-growing domains for understanding consumer behavior and achieving sales enhancements. IT company leaders need to identify critical UX design elements and implement effective solutions to improve product innovations (Dove et al., 2017).

Contribution to Business Practice

The users' experiences and satisfaction demonstrate the value of understanding the successful UX design in product innovation (Deng et al., 2017). IT company leaders and strategists must innovate user products or services through UX design (Shin et al., 2017). Findings from this study provided a more comprehensive understanding of successful product innovation strategies for IT company leaders to achieve product success. My study provided information to IT company leaders to identify and implement effective UX design to improve product innovation and thereby increase organizations' profitability.

Implications for Social Change

The implications for positive social change from the study were by helping IT company leaders to provide better products for improving product users' lives through enhanced product functions and features. The implications for positive social change also included the potential to increase the sustainability of businesses through increased revenues, eliminating unnecessary costs, reducing employee exhaustion, job opportunities, and augmentation of incomes for employees, families, and communities.

Further implications for positive social change included fostering product usability, improved quality of life, and creating new products and new occupations for ultimately advancing the economic betterment of societies.

A Review of the Professional and Academic Literature

The purpose of conducting this case study was to explore the product innovation strategies some IT company leaders use to improve UX design for product innovation. The general business problem was product innovation proposals without a focus on critical UX elements failed to satisfy users. The specific business problem was some IT company leaders lacked strategies to identify the critical UX design and implement effective UX design solutions to improve product innovation. The central question of this study was: What strategies did some IT company leaders and UX designers used to identify the critical UX design elements and implemented effective solutions to improve product innovation?

Strategies for improving UX design in product innovation were aligned with disruptive innovation theory (Huang, 2016; Kim et al., 2020). While some research findings revealed that strategies for improving UX design increased the budget through extra labor costs (Fleming-May et al., 2018; Pennington et al., 2016), several researchers found a significant relationship between improving UX design and disruptive innovation. Disruptive innovation theory describes an innovation process for a product from an embryonic stage, through steady market growth, to eventually challenging established market-leading competitors (Christensen, 1997). Because the purpose of UX design is to innovate products to provide meaningful experiences for the product's users, including

the product's branding, purpose, usefulness, and function (Pennington et al., 2016), leaders can misjudge the users' needs and incur new product design and development projects' failures. Adding a UX design strategy must include attaining more knowledge about the target audience, user behaviors, and user requirements before starting a product innovation (Deng et al., 2017; Maloney & Bracke, 2017). Fearns et al. (2015) and Hahn et al. (2017) identified that implementing strategies for improving UX design in product innovation also creates better living conditions for society. These recent studies had begun to provide insight into how strategies for improving UX design could benefit product innovation success and business profit. The study revealed efficacious strategies for IT company leaders to improve product innovation via enhanced UX design elements.

The literature review included a variety of resources from Walden University Library databases, including Emerald Insight, ABI/INFORM Complete, and SAGE Journals. The use of key terminologies in literature searches was vital in research on UX design for product innovation. I used several online search engines, including Microsoft Academic, Google, and Google Scholar. Searching for the following keywords aided in retrieving articles synthesized in this literature review: *user experience design, user experience, use cases, information architecture, user-centered design, human-computer interaction,* and *graphic user interface.*

I organized the literature review into several sections: (a) UX design, (b) user experience, (c) UX strategy, and (d) UX design process. I ensured at least 85% of the total references are peer-reviewed and published within 5 years. This doctoral study

consists of 153 references of which 91% are peer-reviewed articles. Publication of the reviewed journals, books, and websites primarily occurred between 2016 and 2021.

UX Design

UX design is the process that provides meaningful and relevant experiences to users by enhancing customer satisfaction and loyalty and improving the usability, ease, and pleasure in the interaction between the user and the product (Dove et al., 2017). The UX design involves the design of the entire process of acquiring and integrating the product from the users' perspective, including aspects of branding, design, usability, and function. Products with successful UX design require the entire process of acquiring, owning, interacting, and even troubleshooting (Lallemand et al., 2015). UX design experts focus on creating products that are usable and concentrate on pleasure, efficiency, and fun. A well-designed user experience is often one that meets users' needs in a specific context when users interact with the product (Kim, 2016).

Product designers must consider why, what, and how a product is used to fulfill users' needs (Fearns et al., 2015; Lauer & Brumberger, 2016). The why involves the users' motivations for acquiring a product, whether they relate to a task, values, or views associated with the ownership and use of the product. The what contains the activities or functions people can do with a product. The how relates to the design of the product in an accessible and aesthetically pleasant method. To gain meaningful experiences, UX designers carry the process from starting the why before determining the what and the how (Rose et al., 2020).

UX design encompasses the entire user journey. UX designers come from multidisciplinary fields of backgrounds (Gray, 2016). A designer can often have a background in visual design, information design, programming, technical writing, psychology, or interaction design (Lauer & Brumberger, 2016). Designing for human users demands heightened scope regarding accessibility and accommodation for potential users' physical limitations (Hokkanen et al., 2016). A UX designer's typical tasks vary but often include user research, personas, information architecting, skeleton designing, and interactive prototypes, as well as usability testing. All the tasks can contain different task definitions from one company to another, can always demand designers to be the users' advocates, and keep the users' needs at the center of all design and development efforts. All UX designers work in the user-centered work process and keep channeling the best-informed efforts until they optimally address all the relevant issues and user needs.

UX design is not the same as user interface (UI) design. UX design refers to the context of designing the user experience, while UI design stands for designing the graphical elements for the user interface (Mohammadi et al., 2017). Both the UX design and the UI design are designed to function together to improve the user experience. The UX design covers more analytical and technical factors for users to experience the product, where UI design is close to interface design or graphical design. UX designer and UI designer are different roles; both refer to different knowledge areas of the design process and the discipline. Compared to UX design, UI design is a multifaceted and demanding role that is responsible for the transference of a product's development,

research, content, and layout into an attractive, user-friendly, guiding, and responsive experience for users (Kim et al., 2017). Unlike UX, UI design is a strictly digital profession, means by which the user and a computer system interact with the use of input devices or software.

UX Basic Factors

The basic factors of UX design focus on the explanation and interpretation of a deep understanding of the users (Minhas, 2018). The primary functions of the basic factors include (a) what the users need, (b) what the users value from the product, (c) the users' abilities, and (c) the users' limitations in accessing the product. The UX teams and professionals serve the project targets and objectives through the designing of the basic factors (Lauer & Brumberger, 2016). The best practices of a UX design promote continual improvement in the quality of user interaction with and perceptions of a product through these basic factors (Minhas, 2018).

The honeycomb model framework of UX is the foundation for best practices among UX professionals to guide the efforts across multiple touchpoints with the user, and the honeycomb incorporates six factors that can contribute to UX design (Lauer & Brumberger, 2016). The six honeycomb model factors are usability, credibility, desirability, usefulness, value, accessibility, and findability (Fearns et al., 2015).

Usability means the content is useful. UX designers need to have courage and creativity, apply knowledge of the craft, and create innovative solutions to ensure the products or systems are useful. Credibility means the users must understand the design elements, trust

and believe what information the UX designers intend to convey. Desirability is part of the emotional design, which means the UX practitioners use images, animations, videos, identities, brands, and other design elements to evoke emotion and appreciation. Value of the UX means the product is valuable for buyers. The product or application must deliver value to users. From the user perspective, the content or the product needs to be original and fulfill at least one user's need (Fedele et al., 2017). Accessibility in UX fields means the content needs to be accessible for all users, including people with disabilities. Findability refers to whether users can find what they want through the navigation and locatable function, either on-site or off-site.

The honeycomb model framework provides many benefits for improving UX for end-users. The honeycomb model provides a method for advancing the conversation beyond usability for designers and helps them understand their needs to define experience priorities (Liu et al., 2016). As an example, product owners and UX designers often need to balance between desirability or accessibility for their web products. Product owners and UX designers need to consider if the product is usable or credible. The honeycomb model framework provides the methods for UX designers to balance the context, content, and users, and support the UX designers to make tradeoff decisions explicitly rather than unconsciously. Each factor of the user experience honeycomb model can serve as a standalone measurement tool that helps transform how users see what they do and enables them to explore beyond conventional boundaries in UX design (Liu et al., 2016). The honeycomb model framework supports a modular approach to product design, especially for a web-based product or mobile app (Jiang & Liu, 2018). For example,

provided a company leader intends to improve the App for his company but with a limited budget and time. The honeycomb model framework helps the leader to identify, categorize, and prioritize the factors that are the most important for the App users. The leader can then create an improvement plan and implement the improvements according to the factors.

Other areas for building a successful UX for end-users include the disciplines for the UX practitioners. UX is a growing domain that is still being defined by UX professionals. Creating a user-centered design encompasses the principles of human-computer interaction (HCI) and includes multiple disciplines (González-Pérez et al., 2018; Lauer & Brumberger, 2016).

1. Strategy design: The business managers need to have the capabilities to initiate and integrate UX strategy into product strategy (Lauer & Brumberger, 2016).
2. Project portfolio management: A project portfolio is a collection of projects and programs, and the project portfolio management is the process of analysis and optimization of the costs, resources, and technologies to achieve the portfolio goals. (Lauer & Brumberger, 2016).
3. Information architecture (IA): IA focuses on organizing, structuring, interpreting, and presenting information to users (Rojas &Macías, 2015).
4. User interface design or graphical user interface (GUI) design: The GUI design focuses on anticipating what users need to do and ensuring that the graphical components/interfaces provide the elements that are easy to

access, understand, and use to facilitate user interactions (Kuliga et al., 2015; Lauer & Brumberger, 2016). The GUI design also focuses on ensuring an aesthetically pleasing interface that is in line with brand goals (O'Donovan et al., 2015).

5. User study or user research: User study means understanding user behaviors, needs, and motivations through observation techniques, task analysis, and other feedback methodologies (Frishberg & Convertino, 2020).

Benefits of UX Design

The benefits of applying UX design to product innovation are invaluable. Company leaders have become more aware that a customer-centric approach is vital in the competition (Dove et al., 2017). Products with an improved UX design increase product performance (Bilgihan, 2016). Product managers deliver value to customers through the quality of customer products (Bilgihan et al., 2016). Improved customer relationship through products' UX innovation supports the product leadership in the market (Deng et al., 2017).

Improved UX design enhances product performance from multiple perspectives. An increased UX result ensures (a) greater customer satisfaction, (b) reduced cost of ownership, (c) increased sales, and (d) a competitive advantage (Perdomo et al., 2017; Shin et al., 2017). Customers with high levels of satisfaction will return to the brand (Bilgihan, 2016; Dove et al., 2017). Satisfied customers are also often the best brand ambassadors by providing word-of-mouth advertising (Bilgihan, 2016). Reducing the

cost of ownership is another essential benefit of adding UX design into product innovation (Pennington et al., 2016).

Product managers receive customer satisfaction through the quality of customer products. The typical preconditions for product managers to acknowledge the user scenario include the understanding of the user persona and the interactions between the products and the customers. Product managers gain benefits from optimizing the resources for production or simplifying the processes when they know how customers understand and use the product. Improved UX design helps build a product that efficiently meets the market needs (Pennington et al., 2016). As a result, product managers build a trustworthy relationship and deliver added value to customers through improved products (Bilgihan, 2016; Chen et al., 2016).

As the customer relationship increases, word of mouth marketing grows, and the product has an increased potential to become a market leader. Customers who have a satisfying feeling can possess an emotional and affective bond with the brand (Brostoff, 2017). This satisfied feeling contributes to engagement with and motivation to select future products of the same brand. According to Gray (2016), engaged consumers appreciate products that deliver a positive experience. Engaged customers are cognizant of the company and the product, and they often commit to the brand, making brand loyalty a part of their daily life (Brostoff, 2017). Engaged users seek more information by visiting the company's website, focusing on upcoming products, intending to try new products, or following the company on social media (Jiang & Liu, 2018). These engaged customers repeat purchases of the same brand (Gray, 2016).

Continued user understanding validates the product in the market and provides the company with tools to discover and expand the product features to customers (Gray, 2016). In turn, the company leaders grow and expand their business. Adding UX design into product innovation benefits the company through enhanced product performance with reduced production cost, improved customer satisfaction, and increased market sales. To achieve the advantages, company leaders and product owners must understand that adding UX concepts in product innovation and knowing the users´ interaction with the product is the critical path to product success.

Challenges of UX Design

Company leaders and product designers work to address product defects or improve features that meet specific needs identified by end-users, achieving satisfaction, and the best user experience possible with the minimum effort (Maloney & Bracke, 2017; Pennington et al., 2016). Many companies' managers face diverse challenges when introducing UX concepts into product innovation to increase product value. Company leaders and UX designers gain perks if they consider the following variables carefully.

Product Innovation Fails without UX Focus

Company leaders must align efforts and organizational functions with a UX focus (Pennington et al., 2016). Managers need to design and implement the strategy, analyze how customers interact with the product, and select the timing for organizing the effort to enhance UX design in product innovation. Before doing any research and design, the management team needs to prioritize the UX concept across the entire organization. The managers and the UX experts must serve the specific and measurable targets for UX

design systematically and elaborate process tracking criteria to ensure the cooperation among all company functions are effective and efficient (Shin et al., 2017). If necessary, managers can plan sufficient education for junior employees and even potential customers to explain the UX fundamentals and help them understand the landscape of UX research and design methodologies (Fleming-May, 2018).

Product Innovation Requires a Time Plan for UX Design

The timing for starting the UX research contributes to successful product innovation. In practice, the planning of user research must commence before the product design starts to avoid innovation failure (Deng et al., 2017; Lallemand et al., 2015). Studying the target audience, understanding the user behaviors, and determining the requirements are the critical steps in laying out the entire roadmap for starting a product innovation project (Deng et al., 2017; Maloney & Bracke, 2017). UX experts suggested that the company leaders should align all resources in the project planning phase and spend sufficient effort to understand users' interests and expectations to ensure the product innovation outcomes (Sundt & Davis, 2017). Aligning all the forces of the company can speed up the pace of UX innovation and enhance the effectiveness of the innovation effort.

User Interface Must Contain User Interests

The GUI or visual factors of the user interface need to fit the customers' interests (O'Donovan et al., 2015). User interface design is the look and feel, the presentation, and interactivity of a product (Maloney & Bracke, 2017). The interaction of the GUI is the first impression when an end-user starts to operate the product. Product managers should

emphasize the importance of GUI design in product innovation. Although the elements in GUI design and elements in UX are somehow different from each other, both concepts are crucial to a product and correlated closely together. Although UX Design belongs to a more analytical and technical field, where the GUI Design is closer to graphical design, UX designers must acknowledge the importance of offering impressive interaction channels to attract users and deliver a pleasant experience through the GUI (Maloney &Bracke, 2017). Getting a GUI that most people appreciate demands the designers to fully understand user personas (Gray, 2016). Using the new techniques in UX design can also attract attention (Zaefarian et al., 2017). As an example, for a mobile APP product, adding transitions, animations, and responsive designs often help in shoving the app's GUI presence and supporting users' interactions with the APP.

User Content Design Is Essential for Usability

The provision of information architecture (IA) is essential for user content design and must be high usability to supply powerful features and supply quality user content (Maloney & Bracke, 2017). The user content design must cover all the information that describes the users' behavior when interacting with the product, and the IA is the structure of the user content design (Picone et al., 2017). Company leaders and UX designers perform tests to discover the users' behavior when interacting with the product. As a result, the user study result must represent how they work in harmony to improve the use of a product (Gray, 2016; Sundt & Davis, 2017).

Designing the product for multiple platforms becomes fundamental for usability as users may have multiple devices with different screen sizes and operating systems.

Ensuring the product features operate on various devices and software platforms assists UX developers in attracting users with multiple purposes. User content, either built-in in the product, provided in the user manuals, or published on the website, is important for users to understand and use the product (Perdomo et al., 2017; Sundt & Davis, 2017). Content designers must follow the IA concepts and user feedback to improve the chances of a successful outcome.

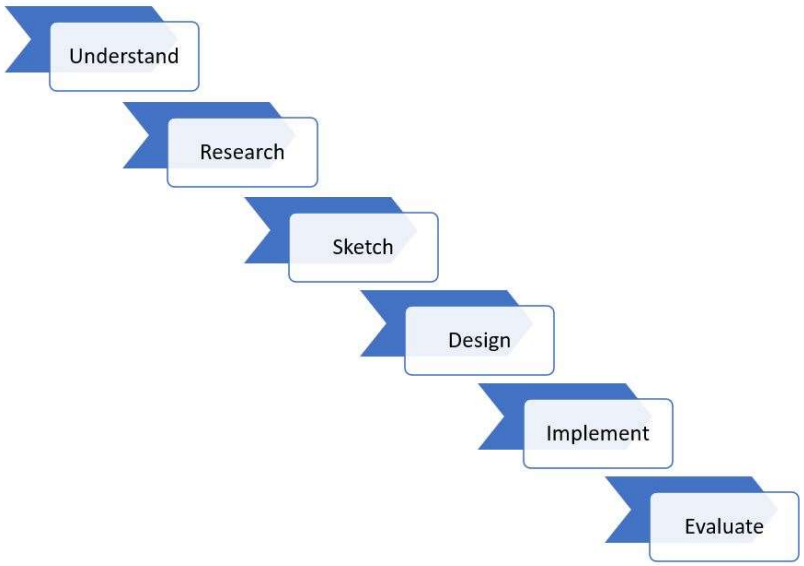
UX Design Process

The UX design process is an iterative method that continuously guides UX professionals and practitioners to improve and enhance product innovation activities (Dove et al., 2017). In the UX design process, business managers and UX teams repeatedly go through different stages to verify and validate the designs at each stage. Each stage of the design process must involve relevant decision-makers and stakeholders to ensure the products' feasibility and usability (Minhas, 2018).

As a part of the product design process, the UX design approach from Minhas (2018) includes the best practices to accomplish the UX design benefits. The process (see Figure 1) involves the following six stages: understand, research, sketch, design, implement, and evaluate (Minhas, 2018). Different companies from different industries can define different tasks slightly in each stage, but each stage's purpose remains the same.

Figure 1

UX Design Process



Stage 1: Understand. Product design needs to focus on solving a specific problem for customers. The product UX design team must understand the problem (Minhas, 2018; Shin et al., 2017). The product UX design team must understand the requirement and customer pains. The requirement specification and analysis are critical for business managers and the product UX design team to explicitly understand what the customer wants and needs. The stakeholders in this stage include the members of the design team, the business managers, and the product manager. Business managers need to work with the customer closely to analyze the requirements. The product UX design team needs to specify and delineate the requirement analysis result in design specifications (Sundt & Davis, 2017). The standard method for observing the requirements from the

customers is to interview them one-on-one through Skype, individually in the industry environment. Together with the product managers, the design team defines the user personas and use-cases based on the specified customer needs.

The outcome of the understanding stage is the approved user personas and the use cases or user stories. A persona is a representation of a user or a group of users with the same characteristics, typically based on the users' requirements, goals, and interests (Almaliki et al., 2015). Design personas focus on the following aspects: user goals, user needs, current behavior, and pain points. The persona, in general, relates closely to the buying or media preferences and behaviors of the users. A persona study must contain the base of field knowledge and real people (Minhas, 2018). Design personas are suitable for communicating research insights and user goals, understanding and focusing on certain types of users, defining a product or service, and avoiding the elastic user and self-referential design. The outcome of the understanding stage is the approved user personas and the use cases or user stories.

A use case, also called a user story or scenario, includes all the interactions between the target users and the product or service (Gebhardt et al., 2016). The use cases must describe the sequence of activities that the users accomplish goals through interacting with the interface of the product or service (Gebhardt et al., 2016; Minhas, 2018). The typical process for creating the use case includes task definition and task grouping, user steps, user expectations and possible failures, iteration and refinement, and the documentation of the use case (Gebhardt et al., 2016).

Stage 2: Research. In the research stage, UX design experts and the IAs research and explore the users and the use cases based on predefined UX design guidelines (Minhas, 2018). Among all stages, the research stage is the critical step to design the user experience. The primary targets for this phase include understanding the market, positioning the company in the competition, and learning from the competitors. The key stakeholders in this stage include the UX team.

The outcome of this stage is the specific predefined ideas and research results for building the actual UX design. Minhas (2018) explained that UX researchers need to understand market competition globally, learn and describe the market section, and obtain inspiration and thoughts from competitors. Another critical action in the research stage is to monitor the latest trends of graphical design, emerging user behavior or interests, principles for product design, the lessons learn from past products, and the existing UX guidelines (Hussain & Mkpojiogu, 2015; Rose et al., 2020).UX designers should conduct a prestudy of possible layouts and options for the product to provide the desired experience.

Stage 3: Sketch. UX design experts and IAs define the user interface elements for the design features in the sketch stages. Minhas (2018) suggested using paper sketches, whiteboard flows, and wireframes to exchange ideas with stakeholders. Sketching and wireframing are essential and useful for product conception and the creation and test of mockup design in a later phase within the stage. The key stakeholders in this stage include the UX experts, the design team, the IAs, and the information designers. As an interactive step, the product UX design team needs to test and validate the mockups in

this stage. Through sketching, the UX team receives the following benefits: (a) quickly eliminate the unwanted design features; (b) outline, define, and document the user interface elements in an engaging method; and (c) supply visual stimuli that help the mockup creation (Perdomo et al., 2017).

The typical outcome for this stage is the approved sketches and mockups. The mockup is a vital output in the whole UX design process, which is essential to keep the UX goal and user in mind and make the design useable and friendly to achieve end-user satisfaction (Minhas, 2018). In most cases, mockups are more than a middleware between wireframe sketches and prototypes. The output from the stage is wireframing and mockups for product prototyping, with variation infidelity.

Stage 4: Design. In the design stage, the product UX design team intake and apply the approved sketches and mockups to user-friendly images with themes and styles for the product (Minhas, 2018). The specification from the understand and research stages are also critical for the design phase (Maloney & Bracke, 2017). The design result must represent the defined principles, guidelines, colors, typography, and iconography for the product. The primary stakeholders in this stage include the design team and the technical experts. The product managers and the business managers play key roles in this stage as they control and approve the graphical elements for the user interface.

The design stage ends with user interface elements: icons, images, colors, style, theme, and guidelines. The design stage finishes with approved visual aspects from the UX experts' turning effort of the black and white wireframes or mockups into colorful interfaces. The achieved GUI elements must align with the brand's identity, theme, style,

design trends, user expectations, and user behavior (Minhas, 2018). After approval of the UI elements, the outcomes of the design stage are the input for development teams to implement in the product.

Stage 5: Implement. The development team and product UX design team create the coding to achieve back-end functions and integrate them with the user interface (Minhas, 2018). Typically, the development of the back-end functions can start with an overlap of the design stage. The development team can also give feedback with minor improvement suggestions for the product UX design team to enhance in the design stage.

The complete user interface with all features and experience is the result of the implementation stage. Before this stage, no input is available from the audience of the UX design until the test publishing for visitors or testers to gain complete access to the UI (Minhas, 2018). After the UI is ready and connects with functions, the UX team can retrieve preliminary data of feedback from designers to determine the effectiveness of the UX design and overall user experience at an early stage.

Stage 6: Evaluate. Tests and evaluations are the primary activities in this stage. Together with product managers and other stakeholders, the design team tests and validates the product according to use cases and experiences; verifying and identifying the product can include further improvements for the end-users (Fleming-May et al., 2018; Minhas, 2018). Testers experience the product and perform comparisons of implementation and user interface. The user feedback the test reports are the primary outcomes of this stage. The evaluation stage is an iterative step, which means the actions can go one round after another (Minhas, 2018). Once the UX team gathered enough data

from the tests of interactions, a product with the desired concept of user experience and satisfaction is ready for delivery.

User Experience

The purpose of UX is to solve problems in people's lives and assist users in attaining goals (Dove et al., 2017). UX designers maximize the consumers' feelings, pleasure, satisfaction, motivation, happiness, efficiency, and productivity when using a product or service (Gray, 2016). UX designers focus on enhancing user satisfaction by improving how people interact with the APPs, websites, applications, and electronic devices (Lallemand et al., 2015; Shin et al., 2017). UX designers simplify complex concepts and problems to make them easy for consumers to understand and use. UX experts determine consumers' concerns and problems with products, then design solutions to address them (González-Pérez et al., 2018). In 2016, product managers and UX designers of MI collected customer feedback from the online forum about the thick bezel of the mobile phone screens. They unscrambled customer concerns and started to develop bezel-less phones. Six months later, their first bezel-less phone MiX triggered great success in the market.

UX concepts encompass several fundamental elements. First, UX designers must acquire a deep understanding of the business problems they want to resolve by observing the way users interact with a product or service (González-Pérez et al., 2018). Understanding business objectives with a user focus allows the UX experts to discover more specific information about potential and actual problems within the program. According to Hussain and Mkpojiogu (2015), a product innovation proposal must always

solve one or more problems for end-users. For example, if a customer struggled to complete online ordering, a UX expert could discover the root cause as a payment method limitation or failure of the user to log into the account.

UX experts need to understand, serve, and engage the end-users (Kim, 2016; Maloney & Bracke, 2017). UX designers need to interview customer support and aftersales professionals to determine customer issues during online interactions and transform the product design accordingly. For a website, typical customer problems include long waiting time, broken links, poor navigation, and too many pop-ups. Product design with a UX focus supports user engagement (Kim, 2016). UX experts must understand the users' needs and desire to help improve UX design to engage the users (Dove et al., 2017). When company leaders use UX experts to gain knowledge about how to deal with the users' emotions, requirements, requests, and needs, the company leaders can provide better and more impactful solutions and target better results (Gray et al., 2015). The UX team must fully understand the benefits of the UX design and create easy-to-use products for users to interact with the brand (Gray, 2016; Rose et al., 2020). In many companies, the product innovation proposals must focus on the typographical factors of a company product, such as a website or software application (Gray, 2016).

Company leaders need to serve and educate the users to develop empathy to understand and share the experience. Meanwhile, comprehending and measuring user satisfaction provides greater clarity regarding positioning and competitive advantage (González-Pérez et al., 2018). Satisfied customers intend to buy more products and create

word-of-mouth influence on others, which increases sales revenue significantly and boosts profitability over time (Hussain & Mkpojiogu, 2015).

In UX practice, creating an effective user-centered design (UCD) encompasses the principles of HCI and includes usability evaluation and IA. Usability evaluation is the process of focusing on how users learn and use a product to achieve the intended result (Deng et al., 2017). The usability evaluation is a measure of user satisfaction as they advance through the process. Typical areas of usability include (a) ease of learning, (b) efficiency of use, (c) error frequency and severity, and (d) subjective satisfaction. Testing and evaluating usability provide the UX team with information on how to improve the UX design.

IA is the architect of all the information needed for users to interact with a product, which targets to present information in a clear and logical approach to help users navigate complex sets of information (Soomro et al., 2016). UX experts use IA to focus on how to organize, construct, and present comprehensible information to users (Maloney & Bracke, 2017). Within UX, IA is an important skill and discipline for UX practitioners. IA represents a knowledge group that covers content strategy, technical writing, graphical scheme, library science, and interaction design to concentrate the design for end-users (Soomro et al., 2016). IA is helpful for UX designers to support users to achieve a goal or comprehend information when interacting with the product (Perdomo et al., 2017; Picone et al., 2017). The UX designers must understand IA is vital for product owners and designers to concentrate on people factors and ergonomics to reach the perceptual and cognitive interactions between humans and machines. Content designers and graphic

design experts need to follow the IA concept, ensuring the user interface is easy to either learn or use, and the content is findable, understandable, and usable, regardless of the knowledge level and the device they are using (Perdomo et al., 2017; Rojas & Macías, 2015).

The distinctive advantages for UX improvements include a customer interaction gauge, establishing user goals, enhancing the user interface navigation, and IA design assistance. To complete the analysis, research practitioners must employ a variety of methods to gather feedback from users about an existing product or plans related to a new product. The UX experience encompasses all aspects of the end-users interactions with the company, its services, and its products. Considering UX in product design is vital for business success. Product managers and business owners need to appreciate the benefits of UX design before the start of new product innovation.

UX Strategy

A UX strategy requires a mix of business strategy and product strategy; the product strategy is a long-term plan to align every customer endeavor with the vision and mission of continuously improving UX for the products or services (Levy, 2015; Rosenberg, 2018). As part of the business strategy and a critical component of the product strategy, the UX strategy is a holistic approach that requires understanding, support, and alignment of effort across organizational functions (Levy, 2015). According to Rosenberg (2018), UX strategy reflects market megatrends and business constraints, meanwhile mitigating the tension of decision-making between product strategy and business strategy. The UX strategy includes a periodical review of the UX status, a vision

of UX improvement, a target of the UX improvement, the plan and Key Performance Indices (KPIs) for measurement of UX investment, and the process of UX development and improvement.

A UX strategy helps the managers determine the key features of a product (Kavanagh-Webb et al., 2016). Using a UX strategy, designers identify and discover the primary functionality that a user needs to complete the major tasks and goals while using the product. UX strategists identify the key features through storyboarding, user scenario generating, and benchmarking. The UX strategy can also help collaborative working among stakeholders and teammates, especially at the idea's inception phase (Nudelman, 2018).

The product manager and the product UX design team require innovative ideas to design product structure experiments. With the experiment result, the design team can test the success of the value innovation to customers using measurable results and design decisions. Furthermore, entrepreneurs need a UX strategy. Business leaders and product managers use the UX strategy to monitor and keep up with user behavioral patterns (Levy, 2015; Deng et al., 2017). With the advancement of technologies and social communication channels, user behavior changes accordingly to adopt new technologies, devices, and features. Following the trend of technology evolution and predicting user expectations are critical to delivering a positive experience for user products.

The UX strategy helps the managers to understand the predefined business targets of the product or service (Rosenberg, 2018). The objective of product innovation is to solve user problems (Levy, 2015). To understand the user problems and how the product

can satisfy the users, the managers need the UX strategy to go through the user problem, the market competition, and then specify the product improvement into actionable tasks.

The UX strategy helps to align all UX investment and effort towards a shared product vision within the organization (Christensen et al., 2020). The UX strategy contains the UX development and innovation process, which aligns all UX-related efforts to achieve the same goals. The UX development and innovation process can also guide the UX teams to maintain consistency across UX touchpoints, features, and devices to guarantee the experience of the product (Bazargan et al., 2017). Finally, the UX strategy ensures the success of UX improvement or innovation. The market megatrends and sales distribution channels are the primary factors that affect the UX strategy and business performance (Rosenberg, 2018). Managers can use the UX strategy to master the business and the market megatrend to measure and optimize the decision-making, ensuring a tactical approach to achieve the successes, or alter a possible failure.

Components of a UX Strategy

A UX strategy includes three essential components: vision, UX activity areas and processes, and KPIs（Levy, 2015）. A UX vision is part of the business vision, and it is an overall roadmap with instructions for employees to follow to improve the UX (Christensen et al., 2020; Rosenberg, 2018). Business leaders should be aware that aligning UX innovation into a product design vision helps give focus and direction for the organization and company culture development (Wong et al., 2016). A typical UX vision must answer the following questions for the company leaders:

1. What type of experience should your customers or users have?

2. What problems can your product help customers to solve in their life?
3. How will the product support the users in achieving their goals?
4. How can the product help your organization to build its brand image?

The UX vision needs to involve the analysis of the feedback from end-users, and the analysis supports the further improvement of the UX vision.

The UX activities and the process engage the managers to obtain and understand the status of the current user experience (Levy, 2015). To create unique, differentiated, and compelling products among the competition, business leaders must create the space and dedicate time and resources, and a plan for the team's workflow for the UX activities. The company leader must follow a proper UX strategy design process that is suitable for his organization to develop a UX strategy (Bazargan et al., 2017).

UX KPIs

Company leaders and UX design experts use the KPIs to review the UX status and steer the improvement of UX for product innovation so that they can create and adjust the UX strategy accordingly (MacDonald, 2019). UX KPIs translate the success factors of the project portfolio and UX innovation achievements into numbers and bring successes and failures to light (Hinderks et al., 2019). In many companies, KPIs help the managers communicate the UX tasks and the associated strategic targets to the decision-makers. A well-defined KPI matrix leads to satisfied employees, fewer mistakes, reduced product cost, and increased revenue (Rozhdestvenskaya et al., 2017).

UX KPI includes two categories: behavioral and attitudinal. Behavioral KPIs represent what a user is effectively doing and how they interact with a product

(Rozhdestvenskaya et al., 2017; Sluis-Theischeffer et al., 2009). The task success rate (TSR), time-on-task, search vs. navigation, user error rate (UER) are typical behavioral KPIs. The TSR is an efficient tool to measure the number of correctly executed user tasks (Park et al., 2019). Statistically, the higher the success rate, the better the user experience. The time-on-task describes the time a user needs to complete a task(Wallach et al., 2017). In general, the shorter the processing time a user spends, the better the user experience.

Users often turn to the search function when they cannot locate the information through the navigation bar (Hinderks et al., 2019). The fewer the users go to the search function, the better the customer experience. The UER is the number of occasions a user failed to access the intended task or function (Wallach et al., 2017). The fact of UER is the clearance and user-friendly of the product (Hinderks et al.,2019).

The attitudinal UX KPI measures the UX efficiency through how users feel or what they say before, during, or after purchasing and interacting with a product (Sluis-Theischefferet al., 2009). Typical attitudinal UX KPIs include System Usability Scale (SUS), Customer Satisfaction (CSAT), and Net Promoter Score (NPS). SUS is one of the most popular and widely accepted equipment for evaluating the usability of a product (Widén & Johansson, 2016). The SUS is part of a usability test, and it requires user participation and comments. UX practitioners carry user surveys to access the SUS data. Researchers use the SUS to quantify the qualitative data of users' feedback and satisfaction for the product. The CSAT is an attitudinal tool that expresses customer satisfaction, which represents the measure of how well a product or service experience meets customer expectations (Zhou et al., 2018). The UX experts intend to evaluate

prospective customer beliefs, ideas, and opinions by measuring the attitudinal KPIs. One benefit of using CSAT is that researchers can track customer satisfaction at different points of interaction with a customer. The CSAT track results help indicate and determine at which point in the interaction funnel the customer stuck with the product (Zhou et al., 2018).

The NPS illustrates customer satisfaction and loyalty by measuring the willingness of customers to recommend a company's products or services to others (Fedeleet, 2017). As a core metric method, NPS contains measurements for three users groups: promoters, passives, and detractors. Researchers use NPS to measure customer experience and predict business performance (Park et al., 2019). NPS is statistically relevant and correlates with a company's development and growth (Fedeleet, 2017). Company leaders use NPS as a proxy for gauging the customers' satisfaction with the product and the customers' loyalty to the brand (Fedeleet.,2017). Using the customer survey is sufficient for getting NPS data (Zhou et al., 2018). In the customer survey, research designers ask the participants for the rate of satisfaction for a specific product. According to the feedback, the researchers categorize the participants into multiple groups: product lover with loyalty to the brand; the promoters group, who have satisfaction but not loyal to the brand; the passives group who have no interest in the product; and the detractors' group (Fedele et al., 2017). Based on the statistics, the NPS calculation is to subtract the detractors from the promoters (Fedele et al., 2017).

Company leaders and UX managers have an interest in measuring and benchmarking the financial aspects of UX design activities (Hinderks et al., 2019).

Tracing and tracking UX activities through UX metrics helps measure the return on investment (ROI) for UX efforts and optimize the conversion funnel. Rozhdestvenskaya et al. (2017) explained that the impact of investment in user experience projects must be measurable, as it links to business performance and revenues. An organization owner invests in UX only if the financial figures add up. Managers must know how to measure and present the ROI of UX efforts before approving the investment. The ROI is the key to introducing and kicking off innovation activities.

A product that lacks the incorporation of user experience in the design is costly. Organizational leaders should consider UX strategy in a product strategy to avoid product failures (Charette, 2005; Talha, 2018). According to Charette (2005), 25% of software failures are related to poor UX strategies such as (a) improper definition of system requirements; (b) misalignment among stakeholders, including customers, development teams, and end-users; and (c) conflicts of interest. By contrast, a product with a well-designed UX could maximize profits and minimize product loss. Product innovation with the integration of UX from the development and design process leads to a demonstrable investment return (Charette, 2005). Van der Werf and Rundqvist (2018) discovered improving UX design factors cause an indirect effect on revenue growth through fewer calls to support centers and fewer complaints among social networks contribute to product success. Product success often represents a sales increase and revenue growth. A calculation of ROI brings quantified numbers for product success. Calculating the ROI helps business managers to steer the UX effort and measure the return on the UX activities.

Development of UX Strategy

The enterprise UX strategy is subject to an ongoing review of the status quo and validation of user requirements. Company strategists and UX design experts require an extended period to understand the UX status and the user's desires to create and implement a UX strategy within a large enterprise (Peres & Meira, 2015; Rose et al., 2020). The UX strategy must cover all the fundamental components: vision, UX activity areas and processes, and KPIs (Levy, 2015).

According to Naji (2016), the development of a UX strategy for an enterprise occurs in several stages: discovery and learning, contextual research and planning, strategy implementation and rollout, and validation and review. In the discovery and learning stage, the target of an enterprise UX strategy is to understand users' needs so that a product roadmap is created that best fits user requirements. UX strategists locate the UX strategy from the user researchers (Naji, 2016). The stakeholder assumptions, the context of the enterprise's strengths and weaknesses, and the market competitions are vital for creating a UX strategy (Rosenberg, 2018). In the contextual research and planning stage, UX strategists study the previous lessons learns and value the innovations within the competitive marketplace (Naji, 2016). UX strategists must differentiate between user experience successes and failures to support the planning (Park et al., 2019). Contextual research helps UX strategists to accurately fine-tune the decision-making process for planning a user-centered UX strategy.

The strategy implementation and rollout stage started when the UX strategists established a UX strategy plan (Rosenberg,2018). The stakeholders review and

incorporate the UX strategy plan into work, enable, and visualize it for the enterprise. In the last stage, all stakeholders and the UX strategists validate and optimize the UX strategy together. A ferocious and efficient UX strategy requires continuous review, feedback, and improvement (Dopp et al., 2019).

Several tools are available to support the UX strategists in creating a user-friendly UX strategy throughout the UX strategy-making process. A user study is an essential tool that a UX strategist needs to create personas, describing the aspect of someone's character presented to or perceived by others (Lin & Cheng, 2017). The data of persona from user study are rather valuable than any assumptions for the users (Park et al., 2019). A wireframe is the graphic representation of an app or a website, and the wireframe contains most of the essential elements and content for the app or website (Levy, 2015). Planning a wireframe within the UX strategy brings many benefits for product innovation, as it is inexpensive and easy to make. Many UX strategists intend to introduce mockups in the UX strategy. The wireframe shows how the app or website is structured, and the mockup presents how the app or website looks. A mockup supplies visual style, elements, and typography of the app or website, and UX experts use it to experiment with the visual aspects of the product (Levy, 2015). The prototype is another powerful tool for reaching an efficient UX strategy. A prototype helps to simulate user interactions, helps to refine the understanding of the requirements, and allows the stakeholders to provide feedback. Because the prototype is clickable and allows the user to experience content and interactions in the interface, the prototype is almost the desired product, but not complete yet.

Transition

In Section 1, I reviewed information regarding the background of the problem statement, purpose statement, nature of the study, and conceptual framework. I included information regarding the research question, definitions, assumptions, limitations, and delimitations. I identified the interview questions for both IT leaders and UX designers. I provided a review of the literature exploring the foundation of UX design, user experience, UX strategy, and UX design process that help IT company leaders to identify the critical UX design elements, create, and implement effective UX design solutions to improve product innovation.

Section 2: The Project

The goal of this study was to explore the user experience design improvement strategies that IT company leaders use to improve product innovation. This section included detailed information concerning the researcher, the research method and design, population, and data collection procedures, and analysis techniques. In this section, I also included a discussion of the study's validity and reliability.

Purpose Statement

The purpose of the qualitative single case study was to explore what strategies the IT company leaders and UX designers use to identify the critical UX design elements and for implement effective solutions to improve product innovations. The target population of the study was five IT leaders from a company in China, whose departments use effective UX design strategies to improve product innovations. I organized and conducted a focus group with four UX designers in the same company to provide additional information for method triangulation. The implications for positive social change included the potential to increase the sustainability of businesses through eliminating unnecessary costs, reducing employee exhaustion, increasing job opportunities, incomes for employees' families, and tax revenues for communities. Further implications for positive social change included fostering product usability, improved quality of life, and creating new products and new occupations, for ultimately advancing the economic betterment of societies.

Role of the Researcher

In a qualitative study, the researcher plays a prominent and distinguished role to ensure integrity, reduce bias, collect and analyze data, and present the findings (Saxena, 2017). My role in this qualitative doctoral study is to select a suitable method and design, collect and analyze data, interpret the findings, then present the investigation results in an unbiased way. Personal characteristics, attitudes, or biases in the research might affect the outcomes (Bero, 2017). A human being acting as the research instrument could potentially lead to an uncertain level of bias due to the unpredictable interaction with the participants (Roulston & Shelton, 2015). My goal is to be aware of and mitigate any personal biases I may bring to the study.

As the researcher in this study, part of my role involved my personal interest in improving UX design for product innovation. Improving UX design was the central focus for product innovation, and I had an interest in business strategies for improving UX design. I worked in the technical communication domain, and I was familiar with user interactions with products; so, UX design was a focus in my daily work. I conducted this research to explore business strategies that IT company leaders use to improve UX design through product innovation.

Another part of the role I had in this study was the interviewer of the participants. The Belmont Report outlined ethical principles that apply to research with human subjects (Miracle, 2016). A typical interview is a one-on-one conversation for gathering information (Kumar & Cavallaro, 2018; Yin, 2017). An interviewer coordinates the process of the conversation and asks questions, and participants respond to those

questions. The interviewer is required to conduct ethical interviews to ensure the respect, beneficence, and justice of the participants (Miracle, 2016). I complied with the standards of Walden University's Institutional Review Board (IRB) concerning ethics on human subjects. As a framework for Walden's IRB, the Belmont Report outlined ethical principles that applied to research with human subjects (Miracle, 2016; National Institute of Health, 2014). I reviewed and followed all the ethical principles and guidelines while conducting my research in the Belmont Report. I ensured all participants were treated ethically and protected during the entire process of my study. I protected all participants' personal information, treated participants in an ethical and respectful manner, and eliminated any possible harm to the participants.

In my interviews of the company leaders and the UX design professionals, I complied with the principles through (a) choosing safe and comfortable time slots, (b) clearly explaining the purpose of the interview before starting, (c) creating a safe environment of the interview, (d) ensuring confidentiality and get permission to use the information provided, and (e) assuring participants that no personal information was disclosed and their anonymity was protected.

An interview protocol serves as a guide and checklist for the researcher to organize the interview questions and discussions (Castillo-Montoya, 2016). Arsel (2017) commented that researchers who develop interview protocols remain focused during the interview. Qualitative researchers use interview protocols to improve the quality of the data that they collect through interviews (Bahrami et al., 2016; Castillo-Montoya, 2016; Yin, 2017). I developed an interview protocol (see Appendix B). The interview protocol

guided the participants and me throughout the whole interview process. I did not influence the feedback from the interviewees' opinions through my questions and interactions. I helped all participants sign confidentiality agreements, and I constantly reminded the IT company leaders and focus group members that I would maintain confidentiality, and they should also keep their information confidential.

Qualitative researchers must minimize error and researcher bias (Yin, 2017). In my study, I understood bias could negatively affect the result, so I tried to mitigate bias as much as possible. Bias in research is a deviation from the truth in planning, data collection, analysis, interpretation, and presentation, which may cause unexpected modification in the conclusions (Roulston & Shelton, 2015). The presence of bias in qualitative studies often connects to a lack of trustworthiness in terms of the researcher's competence, guiding or questioning techniques, or the findings and recommendations provided by the researcher. Bias can also happen if the researcher has a direct association with one or more of the interviewees (Miracle, 2016). I mitigated bias by recording all discussions and maintaining a research journal. I electronically recorded all interviews and maintained detailed interview journals during observations to reduce research errors and misinterpretation of data. I used open-ended questions and semistructured interviews. Qualitative researchers use open-ended questions in semistructured interviews to help them minimize bias and gain an in-depth understanding of the participants' experiences (Yin, 2017).

Participants

Researchers must establish the eligibility criteria to select participants, strategies to recruit participants, and develop relationships to work with participants (Spiers et al., 2018). Selecting participants is an essential decision for researchers, and the method of sampling is critical in qualitative research. Case study research includes individuals or groups who have experienced a phenomenon of interest; purposeful sampling is appropriate (Yin, 2017). Participants would be employees of an IT company in the greater Beijing area that uses UX strategies for product innovation. In this study, interview participants would be five leaders who are involved in creating the strategies and steering the implementation of UX strategies and four UX designers who are involved in the implementation of the UX strategies for the focus group from the same company.

To ensure successful contact with participants, researchers must guarantee accessibility to the participants, the researcher's comfort level, and the establishment of rapport (Luo & Bu, 2016). To gain access to appropriate participants, researchers can contact informants directly or with the help of managers, employees, or personal contacts to gain access to qualified participants (Peticca-Harris et al., 2016). To locate the leaders and UX designers who have implemented strategies for UX design, I contacted the business area director and the design program owners and asked for suitable candidates who meet the criteria for inclusion. I contacted one business area director and two design program owners, introduced myself, explained the purpose of the study, and asked them for candidates who were suitable for the study. In case of not enough

candidates were available, I tried to contact more business area directors. Also, I reached the head of the Product Portfolio Office for User Success for recommendations. The nominations from the business area director and the design program owners increased the probabilities to locate candidates who obtain the required experience in UX design strategy implementation. I contacted five leaders to serve as my interviewees and four UX designers to participate in a focus group from the target organization where I had no affiliation for this study. After receiving verbal confirmation, I sent a written request to outline the timeline. To protect the participants' privacy, I also informed the prospective participants regarding the privacy and confidentiality of the obtained data. I guaranteed participants' identities would remain 100% anonymous.

Researchers need to establish a good working relationship with the participants to ensure data collection. The success of qualitative interviews depends in part on the interpersonal skills of the researcher (Marshall & Rossman, 2016). Building trust, proper consideration of ethical issues, and caring for the politics of organizations are the primary factors in the relationship between the researcher and the participants (Marshall & Rossman, 2016). I did not provide compensatory incentives to participants. The compensatory incentives refer to money or item offered to the participant that acknowledges the time and effort they contribute to the research (Yin, 2017). Researchers noted both positive and negative connotations for offering incentives. Using noncoercive strategies is efficient when selecting participants (Peticca-Harris et al., 2016). Polacsek et al.(2016) reported that offering incentives to participants can trigger coercion. One of the disadvantages of providing incentives to participants include the possibility of

participation rate reduction (Zutlevics, 2016). I included a statement in the introductory email that I did not provide any compensatory incentives in this research. Informed consent is necessary for a study, and the informed respondents would participate in an ongoing consent process (Yin, 2017). The informed consent explains the research and presents the risks and benefits of being involved in the study. The informed consent also includes the expectations and requirements of participation in the qualitative study (Roulet et al., 2017).

In my study, I sent a written request to outline the timeline and explain the purpose of the research, which is to explore successful strategies for UX improvement for product innovation. I also made sure that the participants understood that their contribution would be to talk about their personal experience regarding the successful UX improvement for product innovation. I prepared for the interviews by reviewing background data about the interviewees. The interview process included a rapport-building phase that contained a couple of warm-up questions before data collection, and the interview could enhance rapport between interviewer and interviewee to increase engagement and trust (Luo & Bu, 2016). I anticipated the participants would be willing to continue the interview process, attend further interview sessions, and provide their ideas and viewpoints for the interview questions.

As my secondary source of data, I conducted a focus group of four UX designers. I located the focus group members from the communication with one business area director and two design program owners, and I chose 4 UX designers out of 6 candidates suggested by them. The selection criteria for the focus group members included the

designers from the product UX design team who implemented the UX design improvement strategies for more than two years in the target organization.

The participants for the focus group were members of the product design team at the organization. The product design team consists of UX designers from the organization. The product design team implements the UX improvement strategies in daily work for product development and provides feedback to the organization about how the strategies work in improving UX for product innovation. My contact at the case study organization stated that the product design team had more than 5500 members. I held a focus group interview with four UX designers based on the selection criteria. I asked the participants in the focus group to share their responses regarding additional experiences surrounding the strategies for UX improvement, as well as outcomes of implementing the strategies for UX improvement. As focus group serves a different purpose than the individual interviews, I hoped to gain richer and further in-depth responses based on the knowledge and experience from the members of the product design team, which provides oversight surrounding the phenomenon being studied.

Research Method and Design

Research Method

I used a qualitative research method to explore strategies IT company leaders use to improve UX design for product innovation. Researchers use the qualitative method to gain a deeper understanding of a phenomenon through open discourse with participants, discovery, and investigation to achieve a detailed description of the research question

(Dongre & Sankaran, 2016). Three primary qualitative data collection methods include interviews, focus groups, and document review.

Qualitative researchers facilitate an inductive approach of inquiry to gain an in-depth knowledge of the phenomenon from the participants in their natural environment (Spiers et al., 2018). The differences between qualitative and quantitative research methods involve philosophical assumptions, research questions, methods, data analysis, and presentation of the results (Yin, 2017). The method of choice for a specific study depends on the research question and the purpose of the study. The research questions and purpose of this study of exploring strategies for improving UX design for product innovation align with the qualitative method more than the quantitative method. I selected the qualitative method to discover the in-depth meaning of a phenomenon through open dialog with participants, as I try to gain insight from the knowledge and experience of the participants and gather rich textural data for analysis.

Qualitative research is appropriate when used for data collection and analysis that involves identifying and exploring facts associated with the phenomenon of the study. Researchers use a qualitative case study to facilitate an inductive inquiry into how and why a phenomenon occurs (Yin, 2017). Using a qualitative method facilitates an understanding of a phenomenon occurring in a complex environment where difficulty exists in measuring information experiences, feelings, or knowledge numerically. Quantitative and mixed-method research methods involve sampling strategies based on probability theory to ensure that the collected data represents the population (Guetterman et al., 2015).

Quantitative researchers use a deductive approach with established standardized methods of inquiry to examine a phenomenon. Quantitative researchers examine variables in a controlled environment by using hypotheses to test theories and collect objective data through surveys and questionnaires (Yin, 2017). Researchers use a mixed-method to combine qualitative and quantitative methods and collect data using open dialog with participants and numeric data for statistical testing of hypotheses (Dongre & Sankaran, 2016). Researchers use mixed-method as a means for researchers to analyze quantitative and qualitative data to understand an issue (Guetterman et al., 2015). A qualitative study is more appropriate for this study than a quantitative or mixed-method because I aim to explore the meaning of the experiences of a small group of IT managers. Because the purpose of the study did not entail testing hypotheses, and I would not use a combination of the qualitative and quantitative methods to answer the research question for this study, I rejected both the quantitative method and mixed-method for my study.

Research Design

A case study design is suitable for my research. Researchers use the case study design to collect the evidence based on the angle of the research question and examine the case through multiple lenses, which facilitates an in-depth understanding of the phenomenon (Yin, 2017). A case study design involves demonstrating how interviewees are engaged as vital members of the research process (Spiers et al., 2018). Yin (2017) also noted case studies facilitate the collection of rich data, promoting a greater understanding of the real-life event. In the case study design, subjectivity and researcher bias are prevalent (Fusch & Ness, 2017). McAlpine (2016) indicated that relationships

between researchers and research participants that emphasize dialogic, reciprocal, ethical, and self-awareness on the part of the researcher help mitigate bias and subjectivity. The case study design is also a valid means of studying a phenomenon to determine what happened and why it happened (Wilson, 2016).

Researchers gather multiple perspectives from various sources to complete a picture of the phenomena portrayed in a case study (Wilson, 2016). A single case study includes a comprehensive description and analysis of an individual case and is about determining what the investigated case may be (Yin, 2017). A multiple case study is a research methodology that includes at least two observations of the same phenomenon (Gustafsson, 2017). I used a single case study over a multiple case study to focus on a group of participants from one IT company in Beijing. I conducted this single case study at one IT organization to review its UX improvement strategies and processes. The organizations in the IT industry demonstrate many of the commonly shared interests explained by the literature.

The single case study allowed me to explore an in-depth understanding of what strategies the leaders use to improve UX design for product innovation in this company. I conducted a qualitative single case study for this research. In this single case study, I used a focus group as a secondary data collection method to achieve data saturation and ensure the quality of collected data. I asked questions of the participants until no new concepts or ideas from the responses emerged. A researcher improves the credibility of the data by reaching data saturation (Peticca-Harris et al., 2016). Researchers can use focus group research as a stand-alone design, or in conjunction with other qualitative methods and

designs to reach a valid source for data collection, comparison, and the focus group can also function as a source for data saturation (Spiers et al., 2018). The focus group consists of participants who have experienced the same phenomenon of selection and assignment to a cross-functional business team (O Nyumba et al., 2018).In this study, the context of the focus group was centered on the group members' experiences relative to their selection and assignment to the cross-functional teams and their team experience within a chosen company.

I also considered and rejected two other qualitative designs: miniethnography and narrative design. Miniethnography involves the study of a group, a community, or a subculture for information regarding the status quo (Fusch, & Ness, 2017). The purpose of the proposed study is not to explore a community or culture, so a miniethnographic design is not suitable for my research.

Researchers conduct narrative design to collect, analyze, and describe a person's life (McAlpine, 2016). I did not choose the narrative design, as collecting personal stories was not the appropriate content to analyze UX design. Researchers use narrative design to describe and interpret the personal meanings of participants' lived experiences regarding a specific phenomenon (Guetterman et al., 2015). Because the personal meanings of participants' lived experiences are not related to the purpose of the study, phenomenology is not an appropriate design. Researchers conduct an in-depth, detailed case study of a small group of individuals through interviews or questionnaires with secondary data such as supporting documentation reviews (Spiers et al., 2018).

Population and Sampling

Sampling in research incorporates the number of participants, the process of sample selection, the number of contacts with each participant, and the length of each contact (Marshall & Rossman, 2016). Purposeful sampling in qualitative research is useful for the identification and selection of information-rich cases related to the phenomenon of interest (Malterud et al., 2016; Yin, 2017). Mayorga-Gallo and Hordge-Freeman (2016) noted researchers use a purposeful strategy qualitative studies when they seek to achieve in-depth information regarding the research phenomenon. Purposive sampling is a sampling technique where the researchers rely on their own judgment when choosing members of the population to participate in the study (Etikan & Bala, 2017).

The number of participants differs from one case to another in qualitative studies (Yin, 2107). Researchers determine the sample size by having a large sample to provide accuracy (Fusch et al., 2018). A study with large samples is costly, and it may not be possible to have large samples for some case studies (Watkins, 2017). Yin (2017) explained that the researchers should consider the sample size based on the analysis. Denzin (2012) discussed that the number of participants could range from five to 50 in a qualitative study to reach data saturation.

Researchers believe they can obtain a representative sample by using sound judgment to save time and cost. According to Yin (2017), the purposive sampling method is effective when a limited number of participants can serve as primary data sources due to the nature of research design and aims and objectives. When using purposive sampling to obtain expert participants, smaller sample sizes are sufficient to attain rich, insightful

data (Etikan & Bala, 2017). I used a purposive sampling technique to select the interview and focus group participants for this research. The target population of the study consisted five IT leaders from a company in China whose departments use effective UX design strategies to improve product innovations. I organized and conducted a focus group with four UX designers in the same company to provide additional information for method triangulation. I determine that the sampling sizes are appropriate for this study. Yin (2017) indicated that using small sample size, such as two or three participants, to explore a phenomenon is suitable for a qualitative study. The number of participants allowed me to reach data saturation and answer my research question.

I expected to reach data saturation after interviewing five leaders from the target company and four UX designers for the focus group from the same company. However, if by the fifth leader, I continue to collect new information, I would add additional leaders until no new information is forthcoming. Using a focus group of four UX designers contributed to data saturation, as the focus group was organized after completing the leader interviews. The focus group method in a qualitative study helps the researchers to gain an in-depth understanding of social issues (Hennink et al., 2019). The focus group method allows the researcher to obtain data from a purposely selected group of individuals rather than from a statistically representative sample of a broader population (O Nyumba et al., 2018). There are two benefits of using a focus group to support data saturation. First, the research method of focus groups enables the researcher to examine what and how participants think and why they think about a phenomenon (Yin, 2017). Second, a focus group enables the researcher to interact with the participants on a direct

basis, which provides opportunities for the clarification of responses (Hennink et al., 2019). Both benefits enable me to use the data from the focus group to validate and verify the data collected from the interviews with the target company leaders.

Ethical Research

I conducted this research by following ethical practices during data collection and analysis to minimize harm to all participants. The researcher must protect participants from any harm and ensure there are no possible risks from participation (Yin, 2017). Patten and Newhart (2017) noted that researchers encourage participants' responses in the interview and use informed consent as a means of emboldening ethical values. I contacted potential participants with an introductory e-mail (see Appendix A) to confirm participation. After receiving confirmation, I provided all participants an informed consent letter detailing the informed consent process and serving as a confidentiality agreement by e-mail. Before the start of the interview, I asked all participants to sign the informed consent that described the target of the study, the process, the ethical considerations, and the agreement to participate after I received approval from the Walden IRB (Approval number: 04-07-21-0543083). I also completed the National Institutes of Health Certificate (NIH) certification training course to ensure my compliance with ethical and moral standards for this study.

Following the guidelines of the Belmont Report prepared me to ensure transparency and adherence to ethical practices. The Belmont Report provides an outline of the ethical principles, including respect of persons, beneficence, and justice, that researchers must follow to protect human subjects (Anabo et al., 2019; National

Commission for the Protection of Human Services of Biomedical and Behavioral Research, 1979). I used the Belmont Report as an ethical guideline to respect the interview participants and the focus group members and reduce the risk of harm by involving them in reading, signing, and returning the consent form before conducting the interviews and the focus group.

The informed consent process informs voluntary disclosure, voluntary participation, and discuss confidentiality for the participants in the study. I was honest with all participants in the informed consent process and ethically disclosed all necessary information regarding their responses to the questions for the study. Based on the process, after signing an informed consent form, the participant agrees to legally participate based on the voluntary nature of the study (Patten & Newhart, 2017). Voluntary participant consent is a fundamental standard of ethical research, and all participants were voluntarily joined this study. The informed consent form also details the participants' right to withdraw from the study at any time. I disclosed the option for participants that they could withdraw from the study at any time without penalty. I also notified the participants that they could refuse to answer any questions they felt uncomfortable. Participants might choose to terminate participation at any time by informing me verbally or in writing. I assured participants there would be no consequences for withdrawing from the study.

I ensured the protection of the confidentiality of all participants in this study. Participants' confidentiality is necessary for the data collection process. The protection of participant confidentiality is critical to ethical research (Marshall & Rossman, 2016).

Researchers must reassure participants of their confidentiality to promote honest responses to interview questions (Kawar et al., 2016). I did not include other identifying information of individuals or organizations in this study. All participants selected their pseudonyms to protect each participant's identity in all study materials. I stored all study materials on my personal, password-protected external hard drive in my home office, and only I have access to them. Study materials include the email communications, interview questions, interview recordings and transcripts, the study of the target organization's UX improvement strategies, and any other analysis-related documentation. Walden University requires the storage of all research data for 5 years. After 5 years, I will destroy all study materials, including online, offline, digital, or hard copies.

Data Collection Instruments

I acted as the primary instrument for this study as I collected the data through both open-ended interviews and a focus group. The researcher is the instrument for data collection in qualitative research, because the researcher can adapt the interview through careful listening to and interacting with the participants (Bahrami et al., 2016). In qualitative research, the researcher's biases and preconceptions can distort the data collection, so the researchers must work on mitigating the researcher's biases (Yin, 2017). Using multiple sources of data can help to mitigate the bias of the study. In a qualitative study, using at least two sources of data collection support the research to reach data credibility (Fusch et al., 2018). In this study, I collected data from two sources: the one-on-one interview and internal documents of the target company. The primary source for

this study is the semistructured interviews with five leaders from the target company and four UX designers for the focus group from the same company.

Qualitative interviews are one of the most effective and most common approaches for data collection for qualitative researchers to understand and interpret themes (Kozleski, 2017). Researchers conduct one-on-one interviews to insert themselves into the interviewee's contextual environment (Damsa & Ugelvik, 2017). I gathered data from semistructured one-on-one interviews with organizational leaders. I used open-ended questions during the interview process that allowed the participants to share the UX strategies that IT leaders and UX designers use to increase UX innovation. A one-on-one interview helps the researchers to engage participants in the recording process and establish trust and professional relationships with participants (Andreae et al., 2017). semistructured interviews allow researchers to ask open-ended questions and act at the closest position to the data than doing remote semistructured interviews (Yin, 2017). Open-ended interview allows participants to communicate their lived experiences for a specific phenomenon (Bahrami et al., 2016). I also logged the participants' verbal and nonverbal expressions to digital files to provide in-depth responses.

I created an interview protocol for all participants to ensure the alignment of all interviews (see Appendix B). The interview protocol for this study includes the process and script for me to guide interviews. An interview protocol ensures a common approach to each interview in a qualitative study (Mason, 2017). My interview protocol began with an explanation of the research process, the purpose of the study, informed consent, and participants' rights and responsibilities. Each interview will last approximately 45

minutes, and I got permission from each participant to record the interview prior to beginning.

I worked with the participants to schedule the date, time, and location of the interview with each of them after receiving the response to the introductory email. I began the interview when the participant had signed the consent form and agreed to start. The tool I used for recording is the Voice Recorder from the Windows 10 system. I also used Notepad++ as a note-taking tool to log the key points and the questions from the interviewee. To conduct a successful semistructured qualitative interview, the interviewer must (a) not dominate the interview, (b) not guide or lead the participant, (c) be objective, (d) follow the prescribed interview protocol, and (e) ask follow-up questions as warranted by the participants' responses (Yin, 2017).

To enhance reliability and validity of the data collection process, I encouraged the participants to express their views or experiences about the topic. After each interview, I reviewed the voice recording and my log to ensure the data collection was accurate. I conducted a member-checking process and asked participants to review their responses. During the member-checking process, I provided all participants (both leaders and focus group members) an opportunity to review and revise their responses before analyzing the data collected. All participants were fluent in English as they use English as their only working language. I am fluent in Chinese, and I am able to provide explanations in detail if any participants need clarification, but all formal communications and journals were in English.

I further enhanced validity and reliability through data triangulation. Source data triangulation is one of the best practices to ensure reliability standards in qualitative studies (Turner et al., 2017). Triangulation refers to using multiple data collection equipment, sources, and theories to verify the validity of research findings (Yin, 2017). Data collection from multiple sources supports triangulation through the use of different methods to collect data on the same topic, which involves different types of samples and methods of data collection (Fusch & Ness, 2015). I used two sources to reach data triangulation for my study. First, I collected data from five leaders for individual reviews. Second, I conducted a focus group with four UX designers.

The leaders responded to one set of questions, and the focus group responded to similar questions but from a different perspective. The questions for the leaders focused on the strategies that the company used to improve the UX design. The questions for the UX designers focused on how the strategies supported the UX design improvement. Both sets of data represented the status of the strategies for UX improvement in the company. According to Yin (2017), qualitative researchers attempt to merge multiple sources of data by comparing or synthesizing the separate results or by transforming one data type into the other type to facilitate relating the two data types. I validated my findings when patterns from two different sets of data coincided. I captured additional information throughout the interviews, such as body language and nonverbal expressions in field notes. Taking field notes helps the researcher to reach evidence and details to produce meaning and an understanding of the culture, social situation, or phenomenon being studied (Marshall & Rossman, 2016).

Data Collection Technique

For this study, I will use semistructured interviews through Skype as the primary data collection technique. Semistructured interview techniques support the researchers in conducting the interviews and contribute to the trustworthiness of research findings (Bahrami et al., 2016). I outlined an interview protocol to guide all the semistructured interviews in the data collection process. The interview protocol covers the relevant topics in my interviews, such as the study overview, the study procedures, and the data collection questions (Appendix B). As a secondary data collection technique, I included a focus group and triangulated the data from the interviews and the focus group. Data triangulation facilitates a comparison of the information collected and ensures the credibility of the study findings, and a deeper understanding of the research phenomenon (Fusch & Ness, 2015; Yin, 2017). I obtained a signed consent form from each participant of the focus group before conducting the focus group data collection. I also used the interview protocol to guide the relevant topics and the data collection questions (Appendix B).

There are both advantages and disadvantages in conducting semistructured interviews and focus group discussions through an online method. The semistructured interviews address the research question of this study, and the focus group interview is expected to verify the data collected from the interviews. Researchers use interviews as an important source of data collection in qualitative studies (Yin, 2017). Khodyakov et al. (2017) noted that gaining trust from the participants increased participation, and therefore the research quality, leading to greater efficiency of the research process. Other

advantages of using interviews and focus groups for data collection include the ability to note the participants' nonverbal clues, receive nonsolicited spontaneous responses from participants, and collect data in a timely and cost-effective manner (Marshall & Rossman, 2016). Also, interviewing multiple interviewees provides benefits that include increased organization, interview systematization, and developed a framework provided by the interview protocol. In this study, I interviewed both the leaders and the UX designers, and I consulted the internal documents of the target company to reach data triangulation. So that I benefited from increasing the understanding of the research phenomenon and increasing the validity of the findings.

Interviews and focus groups also present disadvantages. The one-to-one semistructured interviews with open-ended questions can be difficult for participants to make time and prepare for the interviews. The semistructured interview can also be challenging for researchers to accommodate participants' schedules (Rahman, 2015). Because the participants are leaders of the target company, finding appropriate time frames for the interview is difficult. Accommodating a meeting time that fits all focus group members is challenging. I tried to organize the interviews for the leaders at least one month earlier, so they could prepare and make time for the conversations. I also tried to find a meeting timeslot that accommodates all focus group members, booking a time slot right after an internal project meeting when every UX designer is present. The interviews for the leaders and the focus group study of the UX designers allow me to acquire rich data set for exploring the UX improvement strategies at the organization.

The challenge is the researcher must contribute extra effort to data collection to ensure data accuracy.

I used open-ended questions in this study so that the participants could relate their experiences in their work. Asking open-ended questions is a friendly way to engage participants in a conversation, and open-ended interviews allow participants to have a sense of trust and freedom to express their views (Andreae et al., 2017). Participants may feel more comfortable answering questions in a friendly environment and with a well-designed protocol (Patten & Newhart, 2017). A researcher can develop a deeper understanding of the participants' experiences through semistructured interviews (Mason, 2017). The interview protocol covers (a) the research overview, (b) the data collection procedures, (c) the interview and focus group questions, and (d) data presentation. Researchers can ask follow-up questions to encourage participants to provide in-depth responses (Fusch& Ness, 2015). However, the interview process can result in a time-consuming challenge for researchers (Kristensen & Ravn, 2015).

Conducting one-on-one virtual interviews through the online method provides multiple benefits, including cost-saving, time-saving, and less pressure on interviewees (Jones & Abdelfattah, 2020). In this study, I also benefitted from the virtual interview as I could screen remote candidates without traveling. The disadvantages also present as the internet connection and the video quality during the interview are not always reliable (Chandler et al., 2019). Interviewees may need special IT skills to use the online interview tool is a potential disadvantage (Arsel, 2017). I encouraged the participants to select a suitable time and a comfortable and uninterrupted location for the virtual

interview. I went through the informed consent and obtained the participants' signatures before I commenced the interview. Also, I informed the participants that I would conduct the online interview via Skype and use Voice Recorder to capture the interview conversation, and I would use handwritten notes during the interview. I notified the participants that they could quit the interview any time they wanted. I would conduct each interview for approximately 45-60 minutes. I would not extend the time unless the participant has additional information on the questions.

When the interview was complete, I transcribed the data. To ensure the accuracy of data collection, I conducted member-checking by asking participants to review the interpretation of the responses. The member-checking process allows participants to review, correct, and reflect upon the responses (Iivari, 2018; Thomas, 2017). I conducted member-checking by providing all participants (both leaders and focus group members) an opportunity to review and revise their responses. I asked each participant to review and confirm the validity and accuracy of the collected answers. I made any corrections and confirmed with participants that the revisions accurately reflect their thoughts.

Data Organization Technique

The data organization technique includes labeling each participant's audio-recorded interview and storing all researcher notes with each interview (Watkins, 2017). Leaders will be coded as L1, L2, etc., and focus group participants were coded as G1, G2, etc. One of the most common methods for storing data is through computer-aided software and hardware (Bishop & Kuula-Luumi, 2017). Researchers have been increasingly using computer-based software for qualitative research since the 1980s

(Woods et al., 2016). In my study, I used the same computer and the same software, Voice Recorder, to record the interviews. I used NVivo 12 to organize my research data. Using digital software facilitates sorting, labeling, organizing, coding, and classifying the data to enable an accurate data interpretation to answer the research question (Bishop & Kuula-Luumi, 2017). NVivo is useful for organizing data for analysis because it allows me to assign searchable labels, flag text, and create data clusters. NVivo is also useful in uncovering common themes among the data (Woods et al., 2016). Although NVivo does not perform the data analysis, NVivo helps researchers identify categories and themes of the data, and organize clusters of information. In my study, I uploaded data collection through NVivo to organize, code, and label the collected data into different themes before using thematic techniques to analyze the information.

I stored all data following Walden University IRB requirements to protect the confidentiality of the participants. Researchers must ensure confidentiality in handling participants' data (Reed et al., 2016). Ethical researchers must maintain a secure chain of custody for research records (Yin, 2017). To protect confidentiality properly, I will store all digital data on an external hard drive with an encrypted password. I also will store all physical data like paper format materials and physical findings, and the external hard drive in a locked file cabinet in my home. I will keep the physical data and the external hard drive safe from fire, hackers, and any other natural hazards. I will store both the digital data and physical data for 5 years. As recommended by Walden University's IRB, I will permanently delete digital data from the external hard drive and shred all paper format data after 5 years.

Data Analysis

Data analysis means the researchers use a set of processes to understand the deeper meaning of raw data in a qualitative study (Watkins, 2017). In this study, I collected two sets of data from two sources: (a)semistructured interviews with five leaders and (b) a focus group of four UX designers who implemented strategies for UX improvement in their organization. Yin (2017) asserted qualitative case study researchers must embark on a rigorous and thorough process to ensure the dependability and credibility of the findings. Many researchers use methodological triangulation to ensure the dependability and validity of a study. The methodological triangulation allows researchers to verify one set of data from another set of data (Fusch et al., 2018). I used Yin's (2017) five-phase data analysis process as well as method triangulation to support the dependability and validity of the data. The five-phase data analysis process consists of (a) compiling, (b) disassembling, (c) reassembling, (d) interpreting, and (e) concluding.

Compile

Data compilation involves collecting and arranging all research data into a particular order (Yin, 2017). The purpose of the data compilation phase is for the researcher to place the raw data into an organized database (Zhang & Wildemuth, 2015). I started the data compilation phrase after transcribing the recordings of the interviews and focus group, engaging the participants in member-checking, and reviewing organizational documents. I transcribed the interviews to guarantee privacy and confidentiality.

Disassemble

Disassembling in data analysis means the researchers break down the compiled data into smaller fragments or nodes for labeling or coding (Yin, 2017). After transcribing the interviews, I used NVivo to code the data and group the codes into themes. I stored the participant database on an external hard drive and used a password to encrypt the data. I divided the compiled data into smaller fragments or nodes so that I could assign labels or codes. I used qualitative content analysis to analyze the interpretations from the interviews to reveal the participants' responses and thoughts. I analyzed the results of member-checking to ensure the compiled data represented the participants' opinions. The development of core themes occurs during the grouping of data fragments, and the assigned label or code must represent a core theme. Coding encompasses the identification of similar and different topics from the narratives of the participants (Zhang & Wildemuth, 2015).

Reassemble

Reassembling is the process of thematically organizing, clustering, and categorizing the coded data into different groups in the format of lists, graphics, or tables (Yin, 2017). I organized the disassembled data fragments and nodes into thematic groupings as I started the data reassemble phase. I continued to structure the data in an iterative manner to reassemble the data. I rearranged the codes and labels and observed emerging themes and patterns. Researchers use the qualitative content investigation to group data based on patterns and themes to observe and develop a deeper understanding of the phenomenon (Tuapawa, 2017). The analysis of qualitative data

depends on the knowledge and experience of the researcher in identifying themes and patterns (Zhang & Wildemuth, 2015). Researchers must use a logical and consistent data reassemble process to maintain data order and not comingle themes and patterns (Yin, 2017). I used a logical and consistent coding process, confirmed the codes and labels, and worked to ensure correct themes and patterns to prepare the data interpretation.

Interpret

Data interpretation means the researcher uses the reassembled data to create a description that reflects the meaning of the data (Yin, 2017). I discussed and interpreted the data by creating a new narrative that describes the reassembled data in data interpretation. A researcher must understand and explore the collected data in creating a meaningful interpretation for data analysis (Watkins, 2017). A good interpretation is complete, accurate, credible, fair, and new, which provides the reader with a clear indication of the overall trustworthiness of the study (Zhang & Wildemuth, 2015). I avoided subjective interpretation in creating narratives and allowed new possible themes to emanate.

Conclude

The researcher formulates strong conclusions with key statements about the findings from the interpreted data (Yin, 2017). The researcher assesses the data and makes connections to the research question (Bishop & Kuula-Luumi, 2017). I monitored and documented the processes and procedures to ensure accurate and truthful conclusions, thereby ensuring the dependability and credibility of the findings. I

connected my conclusions to answer the research questions. I provided future research topics to cover the gaps uncovered in this study.

The data analysis process is both recursive and iterative, cyclic but not linear (Yin, 2017). The researcher could move back and forth between different phases to search for data patterns. As an example, a data grouping needs additional disassembling or reassembling, so I might return to previous phases to ensure an accurate and complete conclusion of data analysis. I used methodological triangulation in data analysis, and I used internal document review data to validate the interview data. Methodological triangulation helps researchers to improve the credibility of the data (Hennink et al., 2019).

Researchers can use computer-assisted qualitative data analysis software (CAQDAS) to organize the research data (Yin, 2017). Bengtsson (2016) indicated that researchers could use CAQDAS software to easily transform data expressed as words instead of numbers into meaningful qualitative analyses. Although a CAQDAS can save time and effort, the researcher still needs to do decision-making by themselves in the data analysis processes (Yin, 2017). I used NVivo to create a database to organize participants' responses from the interviews, the results from member-checking, and the data collected from document reviews. I used NVivo in all the various phases of data handling, including data storing, grouping, coding, theme identifying, and interpreting.

Reliability and Validity

Researchers incorporate methodological strategies to settle reliability and validity for qualitative research findings (Assarroudi et al., 2018).In qualitative studies,

researchers use reliability and validity to ensure the accuracy, exactness, and trustworthiness of a study (Yin, 2017). Researchers seek rigor and validity in quantitative studies. Qualitative researchers view credibility and validity through dependability, creditability, transferability, and confirmability of a study (Bradshaw et al., 2017). Researchers use methodological triangulation by exploring different levels and perspectives of a phenomenon to ensure a study is reliable and valid (Assarroudi et al., 2018). I demonstrated validity and reliability through dependability, creditability, transferability, and confirmability. I used methodological triangulation to ensure the accuracy, exactness, and trustworthiness of this study.

Reliability

Reliability is the possibility of reaching the same conclusions when another researcher replicates the research using the same procedures (Yin, 2017). Cypress (2017) argued that reliability is a component that researchers must consider when designing a study and analyzing the results. Qualitative researchers can use the following strategies to achieve reliability: transcript review, member-checking, thick description, and coding system (Morse, 2015). Castillo-Montoya (2016) inserted that qualitative researchers could use interview protocols to improve data quality. Yin (2017) suggested using a case study protocol and developing a case study database to improve reliability. Incorporating methodological triangulation in a qualitative study improves the data accuracy and data consistency of a study (Morgan et al., 2016). Researchers include multiple methods of data collection and use multiple sources of reliable data to gain a clear, comprehensive view of a phenomenon (Fusch et al., 2018).

I ensured the reliability of this study through several methods. I developed and used interview protocols. And I adhered to consistent interview protocols to improve the reliability of my study. I used a software called Voice Recorder to record the semistructured interviews and the focus group interview. I used a journal throughout the study to ensure a consistent process so that other researchers could repeat and reach similar conclusions. I used methodological triangulation in collecting and analyzing the data to ensure reliability. I collected data from two different sources: interview data from the leaders and the focus group. I also used member-checking to allow participants' consent of data analysis and interpretation.

Validity

Validity of a qualitative research addresses the soundness of the study. The validity of a study needs to reflect the environment investigated (Cypress, 2017). Ensuring credibility, transferability, and confirmability contribute to the validity of qualitative research (Yin, 2017).

Credibility

Credibility in a qualitative study refers to the level of objectivity and impartiality of findings (Bradshaw et al., 2017). Credibility is an evaluative criterion to assess the truthfulness of the collected data and the interpretation of the findings. Hammarberg, Kirkman, and de Lacey (2016) argued that credibility represents the truthfulness or internal validity of the data, and the accuracy of the researcher's interpretations of the information presented by the participants. Researchers can choose different strategies to establish credibility in studies. Yin (2017) suggested researchers could reach credibility

through recruiting and interviewing experienced participants. Iivari (2018) indicated that member-checking is an important process that a qualitative researcher could use to improve the credibility of the data and the findings.

I established credibility by using member-checking to validate my research findings. Member-checking involves asking the participant to check the transcribed interviews to enhance the accuracy of the collected data (Fusch et al., 2018). The participants for this study are credible informaticists within the UX team of the target organization. I used member-checking for the individual in-depth interviews as well as the focus group in this study. To ensure integrity and trustworthiness, I provided the participants with the transcribed data after each interview session. I ensured the participants had the opportunity to correct any discrepancies in the interview data.

Transferability

Transferability refers to how applicable the research findings are to others in a similar setting (Bengtsson, 2016). Transferability is the level to which the qualitative findings of an investigation can be applied or transferred across the context boundaries (Cypress, 2017). To increase transferability, researchers provide a systematic description of the population and the data collection process for readers to apply in their context (Morse, 2015). In my study, I collected rich and in-depth data through multiple sources and ensured an in-depth description of the phenomenon. I provided a detailed description of the data collection methods and procedures to make sure my findings were transferable to different settings.

Confirmability

Confirmability is how the research remains objective in the interpretation of the data, which involves findings that represent the respondents' point of view (Yin, 2017). Researchers must ensure the findings include authentic, nonbiased data and nonbiased interpretations of the collected data (Yates & Leggett, 2016). Bradshaw et al. (2017) suggested that researchers connect the research findings to the collected data and attain data saturation to accomplish confirmability in a qualitative study. Researchers need to uphold a logical, clear, precise, and organized journal during the study to ensure confirmability (Marshall & Rossman, 2016).

I ensured my study was objective, so that I could demonstrate truthfulness in the collected data and the research findings to prove that my personal bias did not influence the data collection or research findings. Yin (2017) inserted that researchers developed a strict scientific process to conduct case studies and adopt a rigorous approach to remove personal biases. I ensured the data accuracy by following the scientific process and using triangulation methods to support confirmable findings from multiple data sources. Furthermore, I maintained a reflective journal that was logical, clear, precise, and organized to promote transparency and reduce personal biases.

Transition and Summary

Section 2 included a restatement of the study's purpose and covers the role of the researcher in a qualitative case study. I included the process for selecting potential participants, the research method, and discussed ethical research. I provided a rationale for my selected design of a single case study. I also included the techniques for

collecting, storing, organizing the data as well as a discussion of the strategies and tools I will use in the analysis process to identify themes and codes. I discussed the reliability and validity of this study. Section 2 also contains strategies for establishing the reliability and validity of the study, including triangulation, member-checking, and journaling. In Section 3, I will present the findings from my research study, describe applications for professional practice, address implications for social change. I will provide recommendations for future work and offer reflections.

Section 3: Application for Professional Practice and Implications for Change

Introduction

The purpose of this qualitative single case study was to explore the product innovation strategies some IT company leaders use to improve UX design. I gathered data via five IT company leaders and a focus group of four UX designers employed by a sizeable telecom organization in Beijing. The primary data came from five semistructured interviews, while the secondary data came from the focus group discussion. The primary and secondary data analysis revealed five main themes about the strategies to improve UX design for product innovation. The five themes are (a) cultivate a user-centered company culture, (b) improve UX design basic factors, (c) focus on the users, (d) measure UX design KPIs, and (e) optimize the UX design process. Both the interviews and the focus group discussion were conducted online. This section contains a thematic presentation about the research findings represented through the five themes, the application of the findings to professional practice, the implications for social change, and recommendations for action and future research. The study concludes with my reflections and conclusions.

Presentation of the Findings

One central question guided this study: What strategies do the company's IT leaders and UX designers use to identify the critical UX design needs and implement effective solutions to improve product innovations? I conducted semistructured interviews with five IT company leaders from the target organization. Each interview lasted between 30 minutes and 45 minutes. For triangulation, I collected secondary data

to gain a contextual understanding of the UX strategies for product innovation used by IT company managers. The focus group discussion was 45 minutes. I audio-recorded all five interviews and the focus group discussion. After transcribing the interviews, I performed member checking by sharing the recordings with each of the five participants respectively. I also performed member checking by sharing the recording with each of the focus group members. I transcribed and coded the text separately from both the interviews and the focus group discussion during the data analysis.

Theme 1: Cultivate a User-Centered Company Culture

Cultivate a user-centered company culture was a prominent theme that emerged. Driving changes to achieve a user-centered company culture contributes to user satisfaction and company profit (Hastall et al., 2017). Companies with UX-centric development teams and processes can often achieve their organizational goals (Shammout, 2020). Hastall et al. (2017) added that company cultures with a focus on user changes the mindset of the employees and changes the ordinary way of working. The subthemes include user-centered belief and senior management support (see Table 1).

Table 1

Subthemes for Theme 1

Subthemes	Subtheme Descriptions	No. of IT Company Leaders	No. of UX Designers
Subtheme 1	User-Centered Belief	5	4
Subtheme 2	Senior Management Support	5	3

User-Centered Belief

All employees in the company must believe the user is the center of reaching the target. All interview participants discussed a company culture with a focus on the end-users is critical for UX design success. And all focus group participants stressed that a user-centered culture significantly influences the UX design results. Company culture refers to attitudes, behaviors, beliefs, and, most importantly, employees (Shammout, 2020). IT company leader L2 stated,

> Hiring and collaborating with people who know the users is the first step. We noticed the easiest way to effect change and enhance our UX result is to bring on board those directly affected by our customer experience and genuinely care for the customers. To create a user-centered culture, we tried to integrate the UX team and all other teams, including the marketing team, sales team, and customer support team.

IT company leader L3 added that they initiated a human resource process to hire new team members with the end-users mindset. He stated, "To keep a user-centered focus, we only look for potential candidates with similar views towards users. The newly hired team members must closely align with our team's espoused user-centered opinions to continue working with them." All employees need to align the same vision to focus on end-users. A user-centered culture requires a user-focused team within the company (Frishberg & Convertino, 2020). A user-centered culture encourages all people to

continuously be open about feedback and expand their horizons when the user needs change (Lucchi & Delera, 2020).

Focus group participants agreed with similar viewpoints. Focus group participant G3 noted,

> All team members must all have a similar user-centered view towards the users. We hope the team members, including the new hires, have a similar user-centered mindset from the team's perspective. Therefore, we can engage all team members in solving the design problems at the same pace.

All teams must be conscious about the problems they are solving, for whom and why, and actively share user study results, personas, and use cases to support the user-centered culture (Lucchi & Delera, 2020). Focus group participant G3 also inserted that solving the problems in a user-centered method allowed the team members to consider the big-picture about how designers can use their skills to propel large-scale change in small actions. Cultivating a user-centered company culture requires all the team to believe in a user-centric organizational setup. However, the leaders must ensure the teams have the same standpoint. And all the team members need to possess the user insights and engage in the user-centered belief.

Scholars revealed that creating user-centered beliefs supports cultural change and benefits product innovation. Pennington et al. (2016) indicated that with the user-centric organizational setup engagement from all the teams, IT company leaders could develop appropriate UX design improvement strategies to mitigate misjudgments. Similarly,

Dopp et al.(2019) denoted that creating user-centered belief help ensure the success of UX design efforts for product innovation.

Building a user-centered belief supports interruption of the typical product design progress and prove it to be disruptive. One form of disruptive innovation often refers to interrupting regular design progress or activity (Alberti-Alhtaybat et al., 2019). Creating user-centered beliefs contributes to design process improvement that aligns with the disruptive innovation theory. Business owners enhance the user-centric concept and alter the regular UX design process to make products less expensive and more accessible (Dopp et al., 2019). IT company leaders adjust the design process by introducing user-centered beliefs. Therefore, the UX design teams can understand the users' pain points and create less expensive products that fit users' needs.

Senior Management Support

Support from senior management and key stakeholders is necessary for building a user-centered company culture. All interview participants discussed cultural reform that requires support from senior management. And three out of four focus group participants (G1, G2, and G4) stressed that support from the management influences cultural reform. IT company leader L3 stressed,

> Cultural change is often inherently unsettling for all the people within an organization. When the change emerges, everyone will turn to the management team for help, guidance, and direction. The senior managers must embrace user-centered cultural changes. Then, challenge the status quo, identify and create the tactics, and motivate the staff to pursue the change.

IT company leader L4 added,

> We need to review the effect on each department and how it cascades through the organizational structure to the individual level once we decide to build a user-centered culture. To mitigate the impacts, we realized that training and providing all kinds of support are the best solutions.

Driving a user-centered cultural change requires senior management support. All managers and key stakeholders must speak with one voice during a cultural change and model the desired behaviors (Boström et al., 2017; Gumay et al., 2020). The managers must understand that while building a cultural shift, all company individuals going through the changes need sufficient support (Teixeira et al., 2021). Throughout the change management process, managers need to initialize multiple support to measure the impact of the changes and ensure that continued reinforcement opportunities exist to build proficiencies for employees (Boström et al., 2017).

The focus group discussions supported that building cultural change requires support from senior management. Focus group participant G1 indicated that "We want to see a change management plan that agreed by all senior managers, which supports a smooth cultural transition." He noted that employees tend to know that they will receive information and guidance through the change journey. He mentioned, "It is also important that we know we will receive training and other support to teach us the skills and knowledge for the change." Focus group participant G4 inserted, "Integrating multidimensional support during the cultural change is essential to assist employees in

adjusting themselves to the change. Employees can build the proficiency of behaviors and technical skills needed to achieve the change targets."

The emergent theme of cultivating a user-centered company culture is consistent with prior studies. Lucchi and Delera (2020) suggested creating an effective user-centered company culture is to have everyone agree in principle to highlight the product design needs to fulfill the users' needs in the end. Creating and promoting a user-centered company culture steeped in understanding the user is undeniably difficult without stakeholders' support (Frishberg & Convertino, 2020). The results also were linked to Christensen's disruptive innovation theory. Cultivating a user-centered company culture brings advantages to the firm among competitors who do not implement a similar strategy. With a user-centered company culture, IT company leaders can improve design results, create user desired products, and generate room for higher performance and productivity, resulting in more market share.

Theme 2: Improve UX Design Basic Factors

Participants revealed improving the company's UX design basic factors are necessary for product innovation. The theme of improving the companies' UX Design basic factors emerged from Interview Questions 3, 5, 6, and 7. The subthemes of UX design basic factors are (a) usability and usefulness, (b) desirability and credibility, and (c) accessibility. All interview participants, including the IT company leaders and the focus group members, agreed on improving the companies' UX design basic factors that can enhance product innovation (see Table 2).

Table 2

Subthemes for Theme 2

Subthemes	Subtheme Descriptions	IT Company Leaders	Focus Group
Subtheme 1	Usability and Usefulness	5	4
Subtheme 2	Desirability and Credibility	5	4
Subtheme 3	Accessibility	5	4

Usability and Usefulness

Participants depicted that user products need to be usable and useful. A product must be useful and usable to fulfill users' needs and create value. The IT company leader L1 suggested that,

> Product innovation design strategy must focus on creating a useful and usable product. If a product is not useful or usable to the users, why would a company want to make it and sell it to the market? Therefore, the product must achieve the user's goal.

IT company leader L4 commented that "a successful product or service must be useful and usable, filling one or more customer needs. The product has no real purpose if the product or service is not useful or fulfilling the end-users requirements." Product innovation must incorporate added values through creating useful products for users (Dove et al., 2017). The focus group members agreed that a useful and usable product would serve a purpose for target customers. Focus group member G3 indicated that,

> The product needs to embody a purpose and bring value to the customer so that it can compete for attention alongside a market full of purposeful and useful products. As UX practitioners, we must have the courage and creativity to ask whether our products and systems are usable and useful. We must apply our knowledge and skills during the UX design to maximize the innovative solutions that create more usable and useful products for our customers.

Design for users is the primary goal for IT company leaders and UX designers. A product must be useful and usable to fit the purpose of the users (Demuth et al., 2020). If the UX designers achieve no innovative goals, the product will contain no point and means, and the product will never be successful. A product with increased usability and usefulness can increase the chances of user adoption. According to Kivimaa et al. (2021), new businesses innovate and develop useful and usable products to appeal to their demanding customers during disruptive innovation. The more useful and usable a product is, the more enjoyable it can be and more straightforward to attract others to adopt it. Creating useful and usable products align with disruptive innovation theory. New entrants intend to attract the incumbent business's mainstream customers by providing better usability and usefulness (Cho et al., 2020; Krishna & Reddy, 2020). Si and Chen (2016) noted that disruptors often introduce new technology to increase product usability.

Desirability and Credibility

User products need to be desirable and trustworthy. Entrepreneurs tend to improve users' quality of life by supplying better design with improved desirability and credibility of the product. IT company leader L3 contended,

> We intended to create a product that users desire and trust. We must always ask questions like, Do users want to use the product to achieve their goal? Is our product a pleasing thing to have? Does the product make people feel good in their hands? Does the product look good and to the touch? Does it come in pretty colors? Is using it enjoyable? The aesthetics and user's emotional answers matter. Users must believe that they will achieve their goals when they reach the end of their user journey.

Understanding and exploiting the emotional responses regarding desirability and credibility help designers to influence users appropriately (MacDonald, 2019). IT company leader L5 inserted, "We need to maintain quality of the product over time and treat our clients well, simply because our products need to be trustworthy. Reputation and good quality are essential for building customer desirability and credibility."

The feedback from focus group members reflects the same viewpoints. Both the IT company leader participants and focus group participants agreed that the products need to be desirable and trustworthy. Focus group participant G2 stated,

> We are on the right track to building trust for customers. Nowadays, most companies have online web pages for customers to review their products. Adding comments to these dedicated review sites makes users' lives clear social proof to the digital age. Customer feedback builds confidence and helps others make their decision on whether or not to choose our product.

Desirability and credibility are located at the center of UX design that gauges how a brand and its products attract users (Frishberg & Convertino, 2020). Designers keep

users engaged by attracting them to interact with the product and fulfill their targets. Failure to design a desirable and creditable product can lead to user adoption drop, users leave, and sales and market share decrease (Crompton et al., 2020). New entrants can benefit from achieving a better understanding of disruption. A decent understanding of disruption helps the IT company leaders and the UX designers to create user desired products in the target market that is left alone by incumbents. New entrants target the intended market segment and gain traction and credit by providing users with desired products at a reduced cost during disruptive innovation (Alberti-Alhtaybat et al., 2019; Christensen et al., 2016).

Accessibility

IT company leaders and UX designers improve product accessibility to ensure UX design success. A UX-optimized product must be easy for customers to find and provide better access and access for everyone. Accessibility allows users of all abilities to understand, approach, use, and enjoy the product (Navarrete & Luján-Mora, 2018). A company must introduce the best practices to include considerations for accessibility into UX design by default (Christensen et al., 2020). IT company leader L4 urged that

> Content and controls of your product need to be simple to locate and easy to use. If someone can't find it, he can't use it properly. There is a diminishing window of time starting at the initial interaction point, after which product aversion and user stress increase. If it takes me half an hour to work out how to use a vending machine to buy a chocolate bar, you can bet your boots I will never use that vending machine again as I will be pretty annoyed and stressed out!

All focus group participants showed similar ideas in the discussion. Focus group participant G1 suggested, “We included easily find and access into our product design. We thrived on reducing the interaction time for the customer to locate and access our product information.” He continued, “We know that with the advancement of modern technology, these interaction times are ever-shrinking. In some cases, even a minute may be too long for some people to cope with a product.” Focus group participant G2 added that “we need to guide our customers to access our product, even they are with disabilities. So they can easily interact with our product without problems.”

The findings revealed that improving UX design basic factors contribute to product innovation. The emergent theme of improving accessibility is consistent with prior studies. The basic factors of the UX design contain the explanation and interpretation of a deep understanding of the users' requirements (Fearns et al., 2015). An innovative UX design strategy must represent the user's need, the user's value, the users’ abilities, and the users’ limitations in accessing the product (Frishberg & Convertino, 2020). Bazargan et al. (2015) confirmed that the best practices of a UX design promote continual improvement in the quality of user interaction with and perceptions of a product through accessibility improvement. The findings of improving product accessibility are fully aligned with the disruptive innovation theory. Disruptive innovation theory describes an innovation process for a product from an incumbent ignored market segment (Christensen, 1997). Products that are usable, useful, findable, accessible, credible, valuable, and desirable are much more likely to succeed in the marketplace. An analysis of improving accessibility offers insights into users and helps

forecast how the target audience is likely to be greeted (Frishberg & Convertino, 2020). Also, accessibility improvement is concerned with whether all users can access an equivalent experience. A product covering all users' access allows the entrants to innovate in the ignored market segment of the incumbent business. And the incumbent business only develops their products to appeal to the most demanding customers, and they often overlook the needs from the downmarket.

Theme 3: Focus on the Users

Participants indicated the need to focus on the users. User study provides the persona for UX designers to focus on the design for users. A user study is the methodic study of target users, including their needs and pain points (Sangin, 2018). With the findings from the user study, UX designers have the possible insights to focus their design for users. The subthemes related to focus on the users were creating UX designs relevant to users and creating simple and pleasurable products (see Table 3).

Table 3

Subthemes for Theme 3

Subthemes	Subtheme Descriptions	No. of IT Company Leaders	No. of UX Designers
Subtheme 1	Creating UX designs relevant to users	5	3
Subtheme 2	Creating simple and pleasurable products	4	3

Creating UX Designs Relevant to Users

Understanding the target audience is needed for a UX designer to create exceptional products. IT company leaders and UX designers need a deep understanding

of the users' persona to design relevant experiences for them. User personas help UX designers to understand the expectations, concerns, and motivations of target users. So that the UX designers can design relevant experiences to satisfy users' needs. All IT company leader participants agreed that design effort focusing on users helps create UX design relevant to users. IT company leader L2 suggested,

> A product that is not relevant to its target audience will never be successful. The most fundamental reason for doing user study is because the user study is one of the most effective methods to achieve a full image of the people who intend to interact with the product. Therefore, we can focus our design on target users to create a relevant user experience.

IT company leader L3 also indicated that

> If you understand your users, you can make UX designs relevant for them. You will not know whether your design will be relevant if you do not clearly understand the users. We ensured our UX design was relevant to users, and we noticed it is one of the best ways to focus our design on users. We conduct various interviews and observations of people in the contexts where they will use our product. We allocate the user study at the beginning of a project to ensure that the overall direction for the project is relevant to potential users.

UX professionals conduct user studies to reach possible insights as to the link between the UX design and the potential users (Frishberg & Convertino, 2020). A product with a successful UX design provides the user with an intuitive, efficient, and relevant experience (Shammout, 2020).

Three out of four focus group participants (75%) emphasized that creating design relevant to the users was vital for design success. Focus group participant G3 inserted,

> We talked to potential users during the user study about how they perceived our design and how they could imagine using it. In addition, we often involve the potential users directly in our design process to ensure that our design is relevant to them. We established a process to validate our ideas with prospective users. So that we guarantee that all our UX design effort continues to be relevant to the users.

Focus group Participant G4 added,

> To ensure the UX design is relevant to the users, we work with stakeholders to define the success criteria for the user study. User selection is also critical for the user study. We need to define the proper user persona for the participants and select qualified participants. To ensure the UX design is relevant to the users, we also set clear expectations for all the study participants. Furthermore, we always provide experienced UX designers from our team to guide the design is user-centered.

Emphasizing users in the design process and designing relevant experiences for them eventually benefit the company from the product's success. Designing relevant experience demands designers understand the persona, advocate for users, and keep their needs at the center of all design efforts. A product with a successful UX design must involve integrating the development relevant to the end-users (Shammout, 2020). Linking the UX design and the possible users satisfies the users and leads to a higher product

adoption rate (Frishberg & Convertino, 2020). According to Si and Chen (2016), building disruptive innovation is challenging because incumbents depend on end-users and sponsors for resources. They indicate that new entrants must satisfy the users by elaborating efforts to provide an experience relevant to their needs. The new entrants reach the mainstream and exponentially grow once they understand the users and design relevant experiences for them.

Creating Simple and Pleasurable Products

According to the IT company leaders, creating simple and pleasurable products is vital for focusing on users. This subtheme occurred during four interviews, or 80% of the total sample (L2, L3, L4, and L5). And 75% (three out of four, including G1, G2, and G3) of the focus group participants expressed the same viewpoints. Focus the design effort on users helps create simple and pleasurable products. The UX designers often focus their design on the users' nature, how they expect products and systems to function, and how they expect to interact with them easily (Hinderks et al., 2019). UX designers first try to understand their users, define their problem, and solve it to make the solution easy and fun to use (Dove et al., 2017). IT company leader L3 emphasized,

> One of our UX design targets is to ensure that all our product development decisions benefit our users through creating simple and pleasurable products. Our UX design improvement activities intend to provide satisfaction through aesthetic appeal and pleasure, which can significantly influence the success of our products. Understanding users' attitudes, requirements, expectations, and motivations predict product interactions in a design process. Therefore, we create

> simple, easy-to-use products that incorporate emotion and personality and increase user happiness, engagement, brand loyalty, and satisfaction. Our user study revealed that UX designers need to be empathetic and sympathetic to user emotion, which is critical in determining how they interpret and interact with our products.

IT company leader L4 added, “User pleasure often derives from the design for motions. The ability to express emotion through a product can build appeal for the consumer and build affinity between a product and consumer.” In addition, he noted that design for motions could enable a product to communicate how one should interact with it. IT company leader participants L5 suggested, “Design that follows ordinary users' behavior can also bring user pleasure. Behavioral design often focuses on use and understanding, and this reflects the importance of product functionality and how people will interact with the product.”

Focus group participant G1 declared, “If your product’s user experience is not good, and the user cannot reach pleasure while using it, the chances are that people will move on to another product soon.” The more insights the designers know about the user through an optimized user study, the better outcome the designer can provide through the UX design. Focus group participant G3 emphasized,

> We help our users to release stress from their daily lives through our UX design. Tiktok is an excellent example of a company that makes a living by providing a great user experience. While everyone is experiencing the pandemic as a whole, we all have unique experiences. And sometimes, some people are hard to work up

> the motivation to get up in the morning, log in to work, and keep their spirits high. Also, social distancing measures keep people away from their friends and family. However, many funny or inspirational TikTok videos help cleanse stressed brains. In fact, TikTok often positively alters people's day-to-day stressors as it gives people a break from their troubles and responsibilities.

Focus on the users was an emergent theme that aligned with existing literature. Theme 3 reflected that IT company leaders and UX designers must ensure they have users in the center during the design process. Participants within the interviews and the focus group frequently indicated that focusing on the users helps them create UX design relevant to them and create simple and pleasurable products. Sagin (2018) posited that UX design without a user in focus prohibits design success and increases design costs. According to Dove et al. (2017) and Shammout (2020), UX designers must design relevant user experiences according to the users' need and want. Similarly, Frishberg and Convertino (2020) confirmed that staying focused on the end-users and creating simple and pleasurable products benefit both the company and the users. Participants in this study also indicated that focusing on the users needs to incorporate a comprehensive user study to avoid misguiding the UX design.

Creating simple and pleasurable products aligns with the disruptive innovation theory. Disruption occurs once the new entrant highlights the users' needs and attracts the dominant incumbent's mainstream customers (Si & Chen, 2020). When innovating a new product, attracting users' attention and satisfying them helps ensure product success

(Alberti-Alhtaybat et al., 2019). New entrants will achieve a better result of disruption by focusing on the end-users and creating simple and pleasurable products for them.

Theme 4: Measure UX Design KPIs

Another major theme supporting the study was measuring the UX design KPIs. Measuring the UX design KPIs help designers to present the design result and highlights the design's success or failure. The emergence of measuring UX design KPIs as a theme confirmed the interviews and the focus group discussion. The subthemes include measuring UX design KPIs for product success and measuring behavioral and attitudinal KPIs (see Table 4).

Table 4

Subthemes for Theme 4

Subthemes	Subtheme Descriptions	No. of IT Company Leaders	No. of UX Designers
Subtheme 1	Measuring UX design KPIs for product success	4	3
Subtheme 2	Measuring behavioral and attitudinal KPIs	4	2

Measuring UX Design KPIs for Product Success

Interviewees and focus group participants indicated that measuring UX design KPIs is crucial for ensuring success in product design. Eighty percent of the IT leader participants (L1, L3, L4, and L5) and 75% of the focus group participants (G1, G2, and G3) agreed that measuring the UX design KPIs is critical for product success. In an R&D organization, KPI alignment allows employees from different functions, such as UX design, test, development, support, and release, to speak in a common language and

march towards the target (Larsen et al., 2021). Company managers tend to measure the design result with numbers (Sauro, 2016). All the literature highlighted that measuring UX predefined KPIs during the design process benefits the product's success. IT company leader L1 noted,

> We noticed the importance and realized several reasons we must measure our UX design KPIs. The KPIs help us communicate our UX-centered design activities and the goals more successfully to the relevant stakeholders. The KPI measuring results provide arguments on cold, hard facts and figures when we need to explain the project status and financial result of our product innovation. Furthermore, measuring KPI also helps us to set a performance-related bonus system. We tried to motivate the designers according to the KPI assessment results, and we noticed it was an effective method. In summary, we strive to reach a successful product out of our UX design.

IT company leader participants L5 inserted,

> Setting KPIs brought us benefits for product success, like guiding our design effort, controlling project cost, and empowering our team members. Implementing a KPI assessment helps us locate before navigating our product innovation target and protects us from making skimble-skamble decisions. We then could move step by step in the correct direction, regardless of how far away to reach the predefined goals. UX KPI measurement is also a powerful design tool to reduce the design cost and inspire team spirit among co-workers.

Focus group participants had the same viewpoint. Focus group participant G1 urged, “To ensure the success of UX designs, we use several KPIs to ensure we can attain the goals. We all know that not all collected data is essential and valuable.” He also spoke about knowing the UX designs must fulfill users’ needs and reduce the cost. He further stated, “We introduced diverse KPIs to measure our UX design projects fits the users’ requirements. We also used the UX design KPIs to report our UX design progress to our managers. Managers seem keen on getting those figures and result through the KPI measurement.” Focus group participant G1 agreed that using UX design KPIs can translate the design factors of the project into numbers and bring successes and failures to light. He confirmed that the managers often reward the design team according to the KPI measurement result.

UX design requires iterations and improvement to ensure the design result. Measuring UX design KPIs benefit organizations and help the managers communicate the UX tasks and the strategic targets to the stakeholders (Frishberg & Convertino, 2020; Hinderks et al., 2019). Managers plan the UX design improvement cycles to ensure accomplishment over product development (Sauro, 2016). Measuring UX design KPIs helps IT company leaders and UX designers reach product success and decrease costs while still meeting customer goals.

Measuring UX design KPI for product success supports disruptors improve their products and drive upmarket. Disruptive innovation refers to company leaders satisfying customers by providing good quality but inexpensive products in a market sector the incumbent temporarily ignored (Rienzo & Chen, 2018). Disruptors meet customer needs

through improved products using successful controlled UX design KPIs (Guiju et al., 2020). In the beginning, disruptor leaders promote excellence in product quality and manage product features by monitoring UX design KPIs closely. Consequently, disruption occurs when IT company leaders have high-quality products that can snatch valuable customers from the incumbent.

Measuring Behavioral and Attitudinal KPIs

The interviewees and focus group participants added that a company must include behavioral and attitudinal Key Performance Indicators (KPIs) when measuring UX design KPIs. Behavioral KPIs present what a user is effectively doing and how they interact with a product through comparable numbers(Rozhdestvenskaya et al., 2017; Shammout, 2020). The attitudinal UX KPIs measure the UX efficiency through how users feel or what they say before, during, or after purchasing and interacting with a product (Shammout, 2020). UX professionals must consider behavioral and attitudinal KPIs when measuring UX design efforts (Rozhdestvenskaya et al., 2017). Both IT company leaders and the docus group members advised that behavioral and attitudinal KPIs are needed for mearing UX design KPIs. Eighty percent of the IT leader participants and 50% of the focus group participants agreed that measuring the UX design needs to include behavioral and attitudinal KPIs. IT company leader participants L4 pointed out,

> We must consider both behavioral and attitudinal KPIs when measuring our UX design activities. According to scholars, typical behavioral KPIs include task success rate, time-on-task, user error rate, and search versus navigation. Common

> attitudinal KPIs contain the system usability scale (SUS), customer satisfaction (CSAT), and net promoter score (NPS). For example, to ensure the users can perform tasks successfully while using our product, we introduced the user success rate and the user error rate. We invited a group of representative users to try a list of practical tasks with a clear definition of task success. All users perform those tasks accordingly, and we measure how successful they are during and after interacting with our product. The collected data from measuring the behavioral and attitudinal KPIs presented our UX design effectiveness and product usability.

IT company leader participants L2 described,

> Using the NPS helps us measure the loyalty of our users and the performance of our products. We developed a survey to use before we finalize the UX study to measure the NPS. One sample question is, Would you like to recommend this product to your friends or family members? The user will indicate a scale of 1-5. If the user selects 5, they are loyal enthusiasts who love our product and recommend our product. On the other hand, if they are unhappy and don't want to use our product, they would choose 1.

According to (Fedeleet, 2017), the NPS calculation is to subtract the detractors from the promoters. Researchers and many companies use NPS to measure customer experience and predict business performance (Park et al., 2019). In general, NPS is statistically relevant and correlates with a company's development and growth (Fedeleet, 2017). IT company leader participants L4 also inserted that they categorized the participants into

three groups: promoters who select 4-5, detractors who choose 1-2, and passives who answer 3. According to the feedback, he confirmed that the promoters group are the product lovers with loyalty to the brand; the passives group, who have satisfaction but are not loyal to the brand; and the detractors' group who have no interest in the product. IT leader participants L2 added,

> After several tries, we found a high correlation between NPS and customer experience, and NPS helps keep tracking our product performance over time. We plan to use the NPS result to guide us to adapt our approach to different types of customers in the future.

Focus group participants agreed the KPIs need to include both behavioral and attitudinal KPIs. However, they depicted that the KPIs are more than just figures for performance evaluation. Focus group participant G3 stated,

> NPS is not only a score for us, but it also guides our UX design improvement. When conducting the NPS survey, we often ask why the score they gave and the suggestions for improvement from the participants. The answers to those questions often reveal what was working for the most satisfied customers and what was causing people to have not-so-great experiences. We try to fix the latter and improve the situation for them. To make all customers happy and loyal to our brand is our ultimate target, and NPS is the best tool among all choices."

Focus group participant G1 depicted a different view. Compared to the behavioral KPIs, he thought using attitudinal KPIs is more critical, as it represents the user's feeling, which can direct impact the product adoption.

Measure UX design KPIs from this study involves measuring UX design KPIs for product success and measuring behavioral and attitudinal KPIs. These subthemes are the significant drivers for positive UX design results and product success. UX design KPIs present the UX design's success factors into numbers and bring successes and failures to light (Hinderks et al., 2019). Furthermore, Larsen et al. (2021) indicated evaluating the UX design performance and mitigating the gap between the design team, and the end-users will guarantee product quality.

The findings from this study support the disruptive innovation theory and confirm that measuring behavioral and attitudinal KPIs enhances product performance in the market. According to Shammout (2020), measuring behavioral and attitudinal KPIs are primarily valuable in the long-term for disruptive leaders: the results aid decision-making and allow the stakeholders to track market trends and benchmark competitors. Furthermore, Rozhdestvensky et al. (2017) concluded that measuring behavioral and attitudinal KPIs efficiently benchmarking the innovation model when disruptors enter a new market. When disruptors succeed in their KPI-controlled innovation model and products in the new market, they march from the fringe to the mainstream market and obtain profitability. And eventually, the product designed through a KPIs guided UX design process could result in a higher level of market share and user satisfaction for disruptors.

Theme 5: Optimize the UX Design Process

Optimizing the UX design process was the fifth theme that emerged from the data analysis. The participants noted that company leaders try to improve the UX design

process that fulfills their companies, their teams, and most importantly, their users.. More than half the interview participants expressed that this strategy, which constitutes ameliorating the UX design process and putting users in the center of the design, was essential for helping them to promote product innovation through UX design improvements. In addition, the focus group participants highlighted optimizing the UX design process as one of the main tools to ensure the UX design result. All the focus group participants stressed using user study as a fundamental entrance for product innovation. Theme 4 includes two subthemes: design result and user study (see Table 5).

Table 5

Subthemes for Theme 5

Subthemes	Subtheme Descriptions	No. of IT Company Leaders	No. of UX Designers
Subtheme 1	Design Result	3	4
Subtheme 2	User Study	4	3

Design Result

Optimizing the UX design process is necessary to ensure the design result. IT company leader participants L1 denoted,

> We must improve our UX design process to ensure design results. A well-developed UX design process improves end users' satisfaction, translating the end users' satisfaction into higher conversion rates, repeat business, and more significant revenue. Integrating UX design in the product design process is highly

> relevant. We continuously improve a UX-focused design framework to help our teams in developing successful products.

IT company leader L1 continued,

> We need to review and modify our UX design process to improve the product experience and increase the adoption of our products. We made several improvements to optimize our UX design process. For example, we set up a test environment for customers to interact with our products to optimize our UX design process. Based on the feedback of those tests, we gathered the user engagement details, and we measured the predefined KPIs accordingly. As a result, we located a 30% increase in our customer engagement, which indicates the insights on what our customers find valuable and what makes them pay. We also involved some experts in redesigning the delivery stages to improve user adaption. Last year, after five to six UX design improvement iterations, we concluded that the customers' adaption rate increased 25%.

IT company leader L3 added, "Optimizing the UX design process also ensured our design plans in resource management and cut development time and costs. Optimizing the UX design process benefits the design organizations and ensures the design results (Sundt & Davis, 2017).

Focus group participant G1 agreed that optimizing the UX design process is necessary and critical for product success. He noted,

> Optimizing the UX design process is critical for our design success. Our previous UX design process could not support the opportunity to address most of the

> usability issues we have encountered during and after the user study. We made improvements in our process to educate our user study participants. We introduced paper prototypes, wiring diagram tool kit, and whiteboard sketches to demonstrate our product during the user study to make them understand the product. And we never see those usability issues again.

Optimizing the UX design process leads to UX design success. Adopting a suitable UX design process and continuously improving it helps create user-satisfied products (Shammout, 2020). Continuously improving the UX design process for the end-user is essential to ensure the design results. Optimizing the UX design process is an iterative method that continually guides UX professionals and practitioners to improve and enhance product innovation activities (Dove et al., 2017). When optimizing the UX design process, business managers and UX teams go through different stages recurrently and constantly to verify and validate the designs at each stage to ensure the products' feasibility and usability (Minhas, 2018).

Optimized UX design result sustains disruptors' success in product innovation. Disruptive innovation requires new entrants to focus on the product design result to challenge established incumbent businesses. (Guiju et al., 2020). Minhas (2018) highlighted that optimized UX design result fits the needs of innovation and brings cost-efficiency. New entrants prove disruptive by successfully delivering better products at a lower price

User Study

The user study is the center of optimizing a UX design process. Optimizing the UX design process needs a focus on users through user study (Frishberg & Convertino, 2020). Knowing the users is the center of the UX design and helps designers with a significant competitive edge in attracting and retaining customers (Shammout, 2020). All IT company leader participants agreed that the user study is essential for optimizing a UX design process. IT company leader L1 urged,

> The foremost of all UX design principles is to focus on users throughout the design process. A UX design process without a user in the center will fail in the end. So that we often created a real user before we start the design." IT company leader participants L3 added, "We need to learn what users are looking for in a product design. And we use user study to find out. We found that a design may seem brilliant to us, but we don't know if the user will like it or not. Using the method of user study enlighted our view of users' need and want.

Three out of four focus group participants suggested highlighting the user study to improve the UX design process. Focus group participant G2 suggested,

> We noticed that adding user study to our UX design process was a great decision. A user study must come first in the UX design process because the design process cannot be based on our own experiences and assumptions. We must ensure that we always have the users in mind when designing a product. And we need hard data from the user study to begin building the product.

Focus group participant G3 indicated introducing user study into the UX design process was not easy but valuable. He added,

> In the user study, we tried different methods to discover the underlying needs and requirements of the user when using our product. And we think user interview works the best for us. A user interview is an in-depth one-on-one discussion between our UX designer and a potential user from the target demographic. The outcome of the user interview is to create personas, which are fictional but represent a selection of real users and their behaviors. All of our designers use the persons as the actual users during the design process.

With the optimized UX design process, UX designers utilize user study to create aesthetically pleasing and intuitive products to attract people and build trust (Christensen, 2020). Focus group participant G3 had a slightly different view, and he indicated that user study is practical to avoid design failure. He noted the user study should not be the critical step of the UX design process. He added that UX designers could start user study later before sketching the IA and the GUI.

The findings from this study indicate that optimizing the UX design process is an essential strategy to improve UX design. Both IT company leaders and focus group members depicted that optimizing the UX design process is a must to ensure design results. They agreed that introducing user study is an efficient method to optimize the UX design process. Optimizing the UX design process guides UX professionals and practitioners to improve and enhance product innovation activities (Dove et al., 2017). Adding a user study into the design process provides user insights and involves relevant

decision-makers and stakeholders to ensure the products' feasibility and usability (Minhas, 2018). A continuously improved UX design process ultimately benefits the design organization.

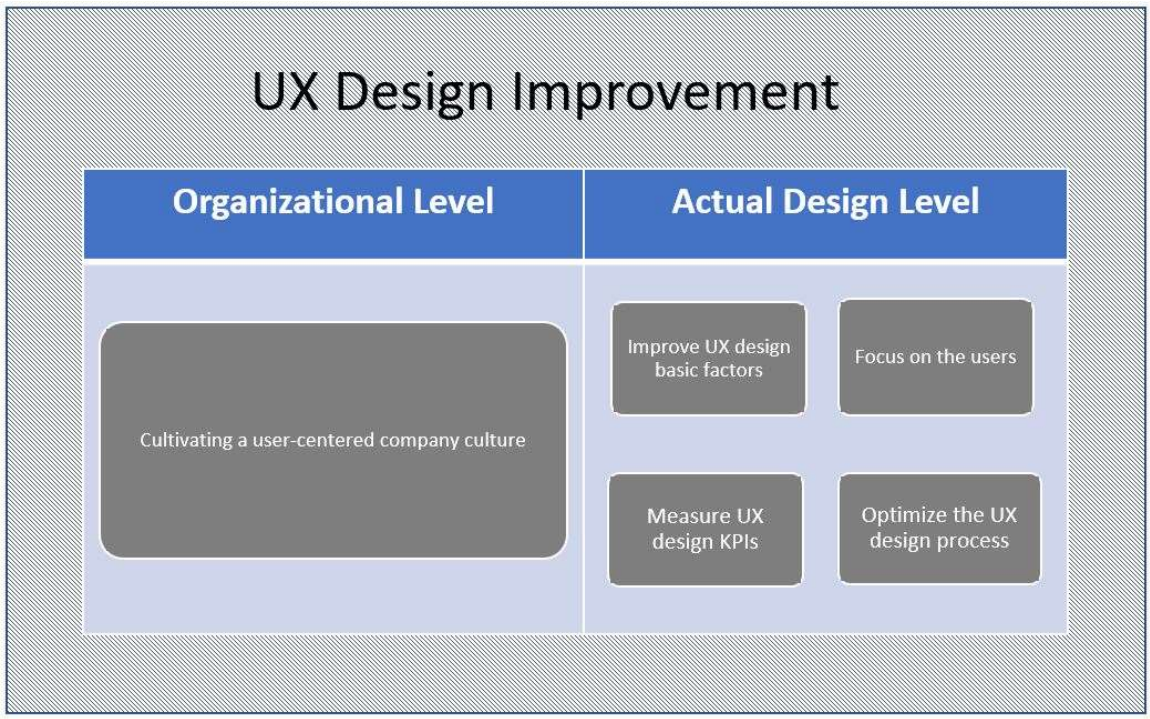
Optimizing the UX design process was an emergent theme that aligns well with disruptive innovation theory as the conceptual framework for the study. According to Christensen (1997), disruptive innovators create products for niche customers that the industry-leading incumbents ignored. Disruptive IT company leaders understand the users precisely through the user study and reach innovation results by optimizing the UX design process. Incumbents are at a disadvantage over the disruptors because incumbents do not clearly understand and focus on the strategies to optimize the design process that the disruptors have.

Applications to Professional Practice

The themes that emerged from this study serve the UX design strategy from two directions (see Figure 2). Theme 1 (the left side of the figure) begins with management cultivating a user-centered company culture from the organizational level. Themes 2 through 5 are strategies the entire design team must adopt to improve the UX design from the actual design level.

Figure 2

UX Design Improvement Strategies



A successful UX design strategy leads to customer satisfaction and demonstrates the value of product innovation (Deng et al., 2017). Having a solid UX design strategy helps ensure that the managers and product teams stay focused on solving the problems for their target users (Rosenberg, 2018). Nudelman (2018) and Shammout (2020) indicated that managers use a UX design strategy to tie the planned design directly to the users' needs, highlight the value in putting the user in the center of the design, and build clear metrics of product success. By following the findings of this study, IT company leaders can also facilitate the monitoring of user behavioral patterns, therefore,

understand the users' pinpoints. By implementing a practical UX design strategy, companies can anticipate users' expectations and deliver products that delight them (Naji, 2016). Findings from this study provided a more comprehensive understanding of successful UX design strategies for IT company leaders to achieve organizational goals. IT company leaders could also benefit from the findings to identify and implement an effective UX design strategy to improve product adoption, increase customer satisfaction, and boost profitability.

Implications for Social Change

In this qualitative single case study, I explored what strategies the IT company leaders used to identify the critical UX design elements and implement practical solutions to improve product innovations. Helping IT company leaders provide better products can improve product users' lives through enhanced product functions and features. The IT company leaders and the UX designers can drive positive social changes by designing and developing highly usable and useful products. Company leaders and UX design teams investigate and solve real-life problems and help people attain their goals; UX design professionals deal with users' pinpoints and analyze and design solutions to eliminate them (González-Pérez et al., 2018).

IT company leaders can also utilize the findings of this study to increase the sustainability of businesses through increased revenues, eliminating unnecessary costs, reducing employee exhaustion, job opportunities, and augmentation of incomes for employees and their families. Managers may implement the finding's strategies to expand businesses performance that leads to internal growth opportunities and external

development for the industry that may improve the economic outlook of the local community. Further implications for positive social change included fostering product evolvement, enhanced quality of life, and creating new products and occupations to ultimately advance societies' economic betterment.

Recommendations for Action

The information shared by the interview participants and the focus group members might supply the IT company leaders with new insight that they could use to improve the UX design strategies. The five themes that emerged from this study are (a) cultivate a user-centered company culture, (b) improve UX design basic factors, (c) focus on the users, (d) measure UX design KPIs, and (e) optimize the UX design process. The results depict a broad view of UX design strategies that IT company leaders use to improve product innovation and prevent failure in attracting users. Company owners make every effort to improve UX design and create user value through product innovation (Zhou et al., 2018). Naji (2016) asserted that company leaders need to develop a structure to promote and improve UX design. The findings of this study should be of interest to IT company leaders to improve UX design strategies to conduct successful product innovation in achieving customer satisfaction and cost savings.

The first recommendation for IT company leaders pertained to the understanding of the users. Conduct user study provides opportunities for the IT company leaders and UX designers to learn about users and their needs. To get the user insights, IT company leaders and UX designers can interview and observe actual or potential users, interview the people who have connections with them, and review existing user personas. When

studying the users, focus on those users who had problems using the products. Learning from users' failures will help the IT company leaders and UX designers create a better product (Tullis, 2019). The IT company leaders and the UX designers can not design and build a product that works well for the users if they do not understand their needs and goals.

The second recommendation is the IT company leaders should value user feedback. Collecting user feedback is essential for improving product development, enhancing product innovation success, and overall customer satisfaction. The IT company leaders should monitor the user journey and comments when testing the product with potential users. IT company leaders can use UX design KPIs like time-on-task, user error rate, and NPS to evaluate the UX design result and get users' feedbacks. Valuing user feedback provides the IT company leaders with a better view of changes and improvements needed to help increase UX design results and reduce product complaints. The user feedback also provides the IT company leaders a chance to review the UX design process and the product quality. A product that corresponds directly with the users' needs should comprise a complaint-free experience for the users to perform the intended tasks conveniently (Mujahid et al., 2018). IT company leaders can analyze user feedback and insert improvement and enhancement processes to avoid complaints.

Recommendations for Further Research

In this study, I explored the strategies IT company leaders use to improve UX design for product innovation. The participants for this study were the IT company leaders and a focus group of experienced UX designers from a successful company.

Recommendations for further study after conducting this research include more research in reaching more types of user data, including the measurement of the user's goals and user's intention analysis using different observation methodologies. A user study focuses on understanding user behaviors, needs, and motivations through observation techniques, task analysis, and user feedback research (MacDonald, 2019). I would suggest guiding a user study to collect extensive user data to understand the potential users better. IT company leaders could measure the user success rate on goal achievement and NPS. The more details the IT company leaders know about the user's goals, and why they intend to interact with the product, the better the UX design strategy could serve the product innovation and help users achieve them.

A limitation for this study was a single case organization within the IT/telecom industry in the Beijing area. Future researchers should consider expanding the findings using multiple organizations and industries to improve the generalizability of the findings. Scholars or IT company leaders could also consider future researches to include organizations within other domestic or global areas. Finally, a quantitative study measuring improvement in this study of a UX design team's success in achieving goals after implementing the five steps recommended would support the need to incorporate these strategies into a UX design plan.

Reflections

Completing this Doctor of Business Administration (DBA) program has been a long and arduous journey for me. I understand the value of education and how much the DBA knowledge can bring to me. During the study, I moved from Beijing to Stockholm.

A new environment and a new job brought diverse impacts on my life. I needed to know the country, the culture, the people, and the language. I was frustrated, and I could not focus on any assignments. So I stepped back and reassessed my goals. As a result, I had to postpone my study for a year. After settling everything around me, I finally overcame all difficulties and got back to DBA classrooms. I received great encouragement to cope with all kinds of problems thenceforth.

One successful case was switching my research method of face-to-face interviews and focus group discussion to online tools due to COVID status. The change of my research method was a significant impact on my study. With the experience learned from the previous case, I had no panic, and I persevered, followed the guidelines, and completed the process. Getting through all difficulties in the DBA journey taught me that there is always a way out of any hardship, and you ought to confront it and conquer it. I must admit that the DBA program molded me to become a better person, a better human being, and a novice scholar. Looking back from the day I started my DBA journey, I realized new meaning in my life through a different spectrum that can contribute to society to a higher level.

Conclusion

IT company leaders need UX design strategies that enhance users' meaningful and relevant experiences by increasing customer satisfaction. About 100% of the product design with a focus on improving UX through product innovation fostered recognized value creation for end-users (Murakami & Koyanagi, 2017). Some IT company leaders lack strategies to identify the critical UX design factors and implement effective UX

design solutions to improve product innovations. The purpose of this qualitative, single case study was to explore this gap in research and practice on the strategies that IT company leaders use to improve UX design effectively in product innovation. I used individual interviews and a focus group to collect descriptions of IT company leaders' strategies to improve UX design. I felt that the research question had been answered through conducting this study. The five emergent themes from the study were (a) cultivate a user-centered company culture, (b) improve UX design basic factors, (c) focus on the users, (d) measure UX design KPIs, and (d) optimize the UX design process. I performed thematic analysis and related the findings between the interviews, the focus group discussion, and the theory of disruptive innovation, which served as the conceptual framework for this study. The findings of this study testify that the IT company leaders should identify and apply proven UX design strategies to achieve product innovation goals. Successful IT organizations, business managers, UX designers, individuals, and communities can benefit from the accomplishments.

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Appendix A: Introductory E-Mail to Participants

Dear Participant:

My name is Jibing Zhao, and I would like to invite you to take part in a research study. I am currently a doctoral student at Walden University, and conducting this research study is part of the doctoral study phase of my degree program. The data that I collect from interviews will be used to explore strategies for the IT company leaders to use to improve UX design effectively in product innovation. As the primary researcher for this study, I will be interviewing participants with knowledge and experience about strategies to improve UX design. The purpose of this e-mail is to inform you about the details regarding participation in the study as well as your rights so that you may make an informed decision regarding participation in this study.

Your participation in this study would be strictly voluntary, and you may withdraw from the study at any time. Should you decide to withdraw, there would be no penalties or repercussions of any kind. Participation in this study will not be paid. I appreciate you taking the time to participate in this study. No interviews will be conducted or any data collected until final approvals have been gained from WaldenUniversity's Institutional Review Board.

Kind Regards,

Jibing Zhao

jibing.zhao@waldenu.edu

Appendix B: Interview Protocol

I will use the interview to explore and obtain data from participants who are capable of providing information relating to the central research question. I will conduct online interviews through Skype and follow an interview protocol for each participant outlined below:

1. Introduction: I will introduce myself to participants. My name is Jibing Zhao, and I am a doctoral student of Walden University. The purpose of this study is to explore the strategies that IT company leaders use to improve UX design effectively in product innovation.
2. Informed Consent Form: I will provide a copy of the signed informed consent form received from the participant. I will encourage the participants to ask questions or seek clarification when needed before, during, or after the interview.
3. Confidentiality: I will reconfirm that information the participant provides is confidential. The researcher will not use your personal information for any purposes outside of this research project.
4. Documents: Before conducting the interview, I will review associated policies and procedures while scheduling a second meeting for member-checking.
5. Interview: I will remind the participant that the interview is audio recorded and will last approximately 1 hour and may continue for 2 hours. The estimated total combined time for the entire process will consist of approximately 5 hours. I will ask each participant the same questions in the same order as outlined in the instrument (see Appendix A).

Closing: That concludes this interview. I inform the participants that I will be delivering and picking up a copy of the transcript. Please expect delivery of the transcript within the next two weeks. Please take up to five days to review the transcript for accuracy, and afterward, I will contact you to arrange a time to pick up the transcript. This process should take no more than 1 hour. Do you have any questions? Thanks again for your assistance.

Appendix C: Interview Questions - Leaders

1. How have you aided your organization in improving its UX design for product innovations??
2. How do you measure improvements in UX design?
3. How did your organization address the key barriers to improve your UX design for product innovations?
4. What strategies were least effective to improve your UX design for product innovations?
5. What, if any, modifications did you apply to any strategy to improve your products' UX innovation strategies?
6. Based upon your experience within your organization, what design strategies did you find worked best to improve your UX design for product innovations?
7. What else would you like to share with me about your organization's strategies for improving your UX design for product innovations?

Appendix D: Interview Questions – Designers

1. What was your reaction to being assigned to implement the organization's strategies for improving UX design for product innovation?
2. How have you improved your UX design for product innovations in your work?
3. What design process modifications have fulfilled the need to implement UX design strategies?
4. Based upon your experiences, what design methods or tools have worked best for improving UX design for product innovation?
5. During your assignment to implement the UX design strategies, how have you addressed the key barriers or problems to implementing the strategies?
6. What additional information would you like to share about the processes and tools you've employed for improving UX design for product innovation?