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School of Engineering

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**Impact of Software User Experience(UX) on Customer Satisfaction of Mobile phone
Users (Android and iOS)**

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Certificate of Completion

This final thesis has been carried out at the School of Engineering at Jönköping University within Informatics. The author is responsible for the presented opinions, conclusions, and results.

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Attestation of Authorship

I hereby declare that this submission is my work, best upon research that I have conducted.

To the best of my knowledge and belief, it contains no material published or written by another person – except where explicitly defined in the Acknowledgements or listed in the References and properly cited. Nor does it contain any material of mine that, to a substantial extent, has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

Syed Manzar Ali Rizvi

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Abstract

This research analyzes the relationship between software usability, software identification, software value (User Experience) with customer satisfaction within the dynamic landscape of mobile operating systems. With the growing importance of user experience (UX) in software design, the study explores how these factors collectively influence users' overall satisfaction, with a specific focus on the Android and iOS platforms.

The research uses the quantitative approach, surveying 200 participants, to gather data on user perceptions and satisfaction levels. The analysis reveals a robust positive correlation between software usability and customer satisfaction. It affirms the pivotal role of intuitive, user-friendly design in shaping user contentment. In addition, the study highlights a positive association between software value and satisfaction and significance of perceived benefits in user experience.

The study also investigates disparities in satisfaction levels between Android and iOS users. While both platforms offer unique experiences, iOS users exhibit slightly higher satisfaction levels. These findings hold practical implications for software developers, marketers, and designers. It enables them to tailor the strategies to cater to diverse user preferences effectively.

In conclusion, this research enhances the understanding of the multifaceted dynamics underlying user satisfaction in mobile operating systems. It underscores the importance of prioritizing usability and perceived value in software design and marketing strategies. This study contributes valuable insights to enhance user satisfaction and ensure the continued success of mobile operating systems in an ever-evolving technological landscape.

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CHAPTER 1: INTRODUCTION

1.1 Background

Smartphones are becoming an integral part of everyday life, with ever-growing capabilities and features. It becomes important to have a good understanding of how people use these devices and how they feel about their experiences. According to Ceci (2022), these portable devices offer an extensive array of features and capabilities, reshaping the way we communicate, work, and entertain ourselves. Understanding how users interact with them and their overall experiences has become a topic of paramount importance. According to Mkpojiogu et al., (2018), user Experience (UX) in the context of software and mobile applications are crucial in shaping user perceptions and behaviors. Beyond the functionalities, it encompasses a user's holistic journey. It ultimately provides benefits like usability, aesthetics, efficiency, and emotional response. It is the sum of a user's interactions with a digital product and the resulting emotions and satisfaction.

The three dimensions of UX collectively define how users interact with software and products, underscoring the importance of designing user-friendly interfaces and experiences that excel in all three areas (Lee et al., 2018). Three dimensions are referred as usability, software identification and software value. **Usability** in UX relates to how well users can achieve their goals when using a software application or digital product. It revolves around the product's ability to facilitate and support users in completing tasks efficiently and successfully. An effective user experience ensures that users can complete their desired actions without unnecessary complications or roadblocks (Mkpojiogu et al., 2018).

Software identification, also known as software fingerprinting or software recognition, is the process of uniquely identifying and categorizing software applications or programs based on their specific characteristics or attributes (Davidavičienė, Raudeliūnienė & Viršilaitė, 2021). **Software value** refers to the perceived benefits and advantages that users or customers associate with a

software application or program. It encompasses the utility, usefulness, and overall worth that individuals attribute to a piece of software in relation to their specific needs, requirements, and expectations (Ceci, 2022). **Satisfaction** encompasses how users feel about their interactions with a product. A satisfying user experience leaves users feeling content, pleased, and fulfilled. It often involves factors like aesthetics, enjoyment, and emotional resonance (Philips, 2022).

UX designs in the Android and iOS platforms differ significantly. iOS follows a flat design pattern, while Android employs material design, which combines skeuomorphism with a flat design to enhance interactivity and user experience (Joo, 2017). iOS follows a tab bar for navigation, whereas Android uses a bottom navigation bar. Furthermore, iOS encourages top-level navigation, whereas Android offers various options like the Navigation Drawer, Bottom Navigators, and Tabs (Bollini, 2017). Android UX should prioritize customizability and flexibility, while iOS UX should emphasize simplicity and streamlining. Consistency across platforms is essential, which allows users to seamlessly transition between devices. UX should also be intuitive to eliminate the need for extensive manuals, and tailored to user needs. It recognizes distinctions between business and casual users (Badran and Al-Haddad, 2018).

This study investigates the impact of software UX on customer satisfaction among mobile phone users on both Android and iOS platforms. Through surveys with users of both platforms, the study explores their experiences with software UX and overall satisfaction. The research analyzes the collected data to analyze the relationship between software UX and customer satisfaction while identifying specific factors contributing to a positive UX.

1.2 Problem statement

UX is based on various elements such as intuitiveness, efficiency, and satisfaction while interacting with software. The previous studies have discussed the UX designs and their impact on customer satisfaction, however, software identification and value is rarely discussed (Bitkina et al.,

2020; Bitkina et al., 2020). The primary problem addressed in this research study is the impact of software user experience (UX) on customer satisfaction among mobile phone users. This issue is critical due to the escalating significance of UX in product evaluation, particularly among mobile device users who engage constantly with their devices. There are very limited prior researches who have indicated the comparison of iOS and android in terms of UX pillars like software value and usability on customer satisfaction.

Past research has underscored the paramount importance of UX in enhancing consumer satisfaction, as inadequate UX designs can lead to significant difficulties in performing basic operations (Spiliotopoulos, Rigou, & Sirmakessis, 2018). Recognizing the significance role of UX in consumer interactions, major industry players like Google, Airbnb, and Amazon have integrated UX into their core business processes to provide exceptional customer experiences (Kumar, 2019). Nonetheless, these studies were not intended to analyze the impact of software UX in the context of mobile phones. Rather, they set the stage for further investigations, which has been discussed in detail in this research. This study offers an in-depth relationship between software User Experience (UX) and customer satisfaction specifically within the mobile phone ecosystem.

The competitive landscape of the mobile market is intensifying, driven by a rapid increase in mobile phone users, a trend expected to persist (Kumar, 2019). Understanding how UX influences customer satisfaction in the context of mobile phone usage is necessary to increase the number of mobile phone users and dealing with the competition among businesses. The research seeks to bridge potential gaps in the existing knowledge and expand our comprehension of how UX impacts customer satisfaction in the mobile phone domain.

1.3 Purpose and Research Questions

1.3.1 Aims and Objectives

This study investigates the relationship between UX and customer satisfaction among mobile phone users (Android and iOS). Through a deeper understanding of this relationship, businesses can refine their products and optimize their digital interfaces to meet consumer needs and preferences.

Here are the research objectives:

- To assess the impact of software user experience (UX) on customer satisfaction.
- To compare the software user experience (UX) of Android and iOS devices from the perspective of mobile phone users.
- To determine the extent to which software user experience (UX) influences customer satisfaction among users of Android and iOS devices

1.3.2 Research Questions

Here are the research questions:

1. How does software user experience (UX) impact customer satisfaction among mobile phone users?
2. How do Android and iOS users perceive and compare the UX of their respective platforms?
3. What specific aspects of software user experience (UX) influence customer satisfaction among Android and iOS users?

1.4 Scope and Delimitations

This research investigates the experiences of mobile phone users specifically using Android and iOS operating systems by using the UX dimensions (Usability, software identification and software value) and its impact on customers' satisfaction. Factors influencing customer satisfaction, such as price, product quality, and brand reputation, are not within the scope of this study. Data is collected through a convenience sampling approach from mobile phone users (Android or iOS devices). While

this approach offers practicality and accessibility, it represents only the UX of mobile phone users. The findings and insights generated through this research contribute to the broader understanding of UX within the context of the mobile industry. It additionally provides valuable insights into the UX aspect of mobile devices, which is of growing importance in the digital age.

1.5 Research Outline

The research outline encompasses several essential chapters. Chapter 1 establishes the research's background, problem statement, objectives, and significance. Chapter 2 discusses the research methodology, methodological choices, hypotheses, data collection, and analysis methods. Chapter 3 introduces the theoretical framework with relevant theories like Technology Acceptance Model and Flow Theory. Chapter 4 presents results and analysis, including frequency and correlation analyses, and regression analysis. Chapter 5 discusses the results based on the results discussion and methodological analysis. In the end, the chapter 6 analyzes the research results summary, implication of results and the need for further research.

CHAPTER 2: METHODS AND IMPLEMENTATION

2.1 Introduction

The chapter discusses the methodological framework that underpins our research endeavors. The exploration begins with a detailed examination of our chosen research method and its rationale. Subsequently, the focus is shifted to the critical aspects of data collection and analysis. The data collection techniques are tailored to each research question, with justifications. The section on methodology explains the different methods and approaches which have been utilised to perform the research consideration. The chapter includes an explanation regarding the method choice, collection of data, analysis and consideration.

2.2 Method and Implementation

2.2.1 Research Design: Survey

The research has used the quantitative research design. This choice stems from a study's objectives and considered as a suitable means to attain them. The selection of a survey as the research method for this study is justifiable on several grounds. Firstly, surveys are known for their efficiency in collecting data from a large and diverse pool of respondents, Hence, it is well-suited for the relationship between software user experience (UX) and customer satisfaction, especially in the context of mobile devices with a broad user base. Secondly, surveys yield quantitative data which yields to the statistical analysis, hypothesis testing, and the identification of patterns or correlations. This approach ensures the generalizability of findings to a wider population, while the structured questionnaire format maintains data consistency (Nardi, 2018). Moreover, the cost-effectiveness and scalability of surveys make them a practical choice for this research.

2.2.2 Quantitative Method

The quantitative research is chosen for its emphasis on quantifiable data, particularly statistical and numerical information. This approach aligns with our research objectives, which center on the

relationship examination of UX and its direct impact on customer satisfaction. The quantitative method allows to harness data-driven insights, substantiate hypotheses, and draw precise conclusions. The statistical data obtained through quantitative research leads to an informed and strategic business decisions (Apuke, 2017). The current research uncovers the intricate dynamics of software UX and its influence. For this, the quantitative research provides the means to generate compelling evidence. This approach ultimately provides the precision and reliability to contribute significantly to understand the relationship between dependent and independent variables.

2.3 Method Choice

2.3.1 Research Philosophy

Positivism philosophy approach is the foundation for this study's approach for its emphasis on the quantitative nature of the user experience and its impact on customer satisfaction among mobile users (Pandey, 2019). Positivism approach focuses on empirical methods and scientific tools for data collection and analysis. It is believed that the reliable information is derived from observable phenomena and that researchers should collect and interpret data objectively (Marsonet, 2019).

Positivism supports the use of statistical analysis and hypothesis testing, which investigates the relationship between software user experience and customer satisfaction. It provides a structured and quantifiable framework for examining this connection. This is considered crucial for drawing meaningful conclusions. Unlike interpretivism, which emphasizes in-depth analysis and does not favor hypothesis testing (Ryan, 2018), positivism's is based on measurable results.

Positivism approach is aligned with the idea that knowledge is best acquired through scientific methods. It is closely linked to the objectivity and the collection of observable data (Hasan, 2016). Reality can be known through empirical observation and researchers have the freedom to design and conduct investigations while maintaining objectivity (Ryan, 2018). Therefore, positivism's compatibility with the quantitative research is chosen to produce the measurable results.

2.3.2 Research Approach

The research approach moves from broad generalizations to specific, detailed data collection, interpretation to analysis. The deductive approach focuses on analyzing a broader population of data and deriving knowledge from numerical results (Wardani & Ksuma, 2020). In contrast, the inductive approach generates data from observations and involves developing new theories based on previous ones (Armat et al., 2018). For this study, the deductive approach is chosen due to its support for knowledge development through testing existing theories and its applicability to a large population. It also facilitates the use of scientific tools for data collection and analysis. Here, hypotheses are formulated and tested during the research cycle, enhancing our understanding of the theoretical foundation (Pearse, 2019).

Starting with a theory, researchers propose hypotheses and test them through empirical observations, either accepting or rejecting the hypotheses based on evidence (Yue et al., 2019). This approach ensures the validity of initial premises under various circumstances and enables the quantification of concepts. Therefore, the deductive approach is well-suited for this research.

2.4 Data Collection

For the online survey, a sample of 200 respondents was chosen randomly through online platforms. Managing and analyzing data from 200 participants was logistically feasible within the research timeline and available resources. A larger sample size might have been resource-intensive and time-consuming, making it less practical for this study. The survey is administered using the SurveyMonkey tool, ensuring ease of data collection and analysis. Recruitment occurs via social media platforms like Facebook, Twitter, and email. The study addresses the research questions comprehensively and enhance the overall reliability of the research outcomes. Detailed questionnaire is provided in the **Appendix 1**. The same set of questions were asked from both iOS and android users, so their answers can be compared and evaluated using SPSS.

2.5 Data Analysis

The data analysis process encompasses descriptive statistics, correlation analysis, and regression analysis, all performed within SPSS. **Descriptive statistics** present a clear overview of the collected data. It is based on the frequency analysis and percentage to summarize the key characteristics of the dataset. It is categorized in terms of gender, age and type of operating system used by those respondents.

To explore the relationships between variables, **correlation analysis** is conducted. Specifically, Pearson correlation analysis is applied to assess the strength and direction of associations between UX dimensions (software usability, identification and value) and customer satisfaction.

For Hypothesis testing, **MANOVA test** is used to compare the means of all three dependent variables (referred as UX dimensions) across two groups (Android and iOS). The purpose of MANOVA test was to analyze the differences between software usability, identification and value among android and iOS users. Here, Levene's Test of Equality of Error Variances is also used to determine the error variance. For another hypothesis, **independent t-test** is used to compare the results of android and iOS users in terms of customer satisfaction levels.

2.6 Validity and Reliability

Reliability is intrinsically linked to the consistency and dependability of research results. It is of paramount importance to assure that the data originates from dependable sources. Both, validity and reliability stand as cornerstones of this research, ensuring that the data is sourced from dependable origins and that the chosen methods and instruments consistently yield accurate results. In this study, Cronbach's Alpha is used to test the reliability of the scale. The researcher has conducted the Cronbach Alpha analysis, a widely accepted method, to measure the validity and reliability of both the data and the survey questions. This approach bolsters the confidence in the research's validity.

The Cronbach's alpha of the usability is 0.838, for identification is 0.781, for value is 0.81 and

for the satisfaction is 0.822. All values are above 0.6 which shows that the scales chosen are reliable and showing valid results.

2.7 Ethical Considerations

There have been several ethical considerations that were ensured by the researcher to conduct this study. Throughout this study, a strong commitment to ethical principles has been evident. Informed consent was taken from respondents prior to data collection. It ensures that their voluntary participation. The principle of respondent autonomy was upheld, with individuals having the freedom to skip questions they were uncomfortable with. Anonymity was preserved and it was allowed to respondents to remain unidentified if they chose to do so. Data collected was used exclusively for the study's objectives, with no manipulation or fabrication. Strong measures were taken to ensure data authenticity and prevent any misrepresentation.

CHAPTER 3: THEORETICAL FRAMEWORK

3.1 Introduction

The significance of delivering a satisfying experience to end-users cannot be overstated in the realm of software products. User experience (UX) encompasses not only the functional aspects and features of software but also the holistic interaction between the user and the program. Despite its widespread application in both industry and practice, there exists no universally accepted definition or theoretical model for Software User Experience (UX). The dynamic nature of user experiences, constantly evolving, further complicates the design and evaluation processes. As highlighted by Badran and Al-Haddad (2018), addressing these UX challenges requires additional research on method selection and the intricate interplay between evaluation and development. UX professionals are tasked with devising strategies to navigate the complexities of comprehensive UX assessments. This chapter takes insights from various aspects of UX, established evaluation techniques and relevant theories and models.

3.2 Key Concepts and Importance of UX

Software User Experience (UX) is defined as a holistic evaluation of a user's perceptions, emotions, and interactions while engaging with software applications. It uses a wide range of aspects, including usability, functionality, and overall satisfaction. UX is a crucial determinant of the success and acceptance of software products (Sarferaz, 2022). Mobile applications are getting popular these days for their robust service delivery platforms. These applications enable retailers to offer products and services to consumers on the move. In addition, there is also the rapid rise of mobile technology and the resulting service innovations are changing customer behaviour in terms of how they connect and use service offerings available anytime (Shankar et al., 2016).

As more and more smartphone users and the adoption of mobile commerce increase, marketers are focusing on providing mobile services to meet the needs of their customers.

Retailers these days invest heavily in the mobile applications to enhance the customer experience (Sarferaz, 2022). When a customer interacts with a service or product, the customer experience is based on the indications and contact points at which a customer interacts. Customer experience is the evolution of a person's sensory, relational, and behavioural responses to a brand. These are linked with the experiencing pre-purchase, post-purchase and post-touchpoint journeys. It evaluates the journey against the response thresholds of simultaneous perceptions (McLean and Osei-Frimpong, 2017). Overall, the customer perception is a combination of cognitive and emotional elements that leave a lasting impact.

3.3 Mobile Application and their Usage

App designers must have knowledge about how customers interact with their app and their feelings. They must know how to design an app that meets customer needs (Parise et al., 2016). There are different mobile apps which can be used by retailers to improve the customer experience (Carlsson et al., 2021). E-commerce apps allow customers to browse and purchase products or services online. These apps have a catalogue of items that can be browsed by category, brand, or price. M-commerce apps allow customers to make purchases using their mobile devices (Parise et al., 2016).

These apps work on a mobile-optimised version of the retailer's website. Loyalty apps reward customers for their loyalty to a particular brand or retailer. These apps usually have a point-based system which allows customers to earn points for every purchase they make. These points are redeemable in the form of discounts, coupons, or free products.

The customer experience is the most important factor in determining the success of a mobile app (McLean and Osei-Frimpong, 2017). Retailers must consider customers in their minds while designing these applications. Key factors like ease of use, functionality, aesthetics, and engagement should be considered while designing such applications. Customers should be able to navigate the app without difficulty. The app must be functional. It should provide the customer with the ability to

perform all the tasks that they need to do (Carlsson et al., 2021). The app must be aesthetically pleasing. It should have a clean and modern design. The app must be engaging. It should keep the customer's attention and encourage them to use it again.

3.4 Mobile Operating Systems

Android and iOS are two of the most popular operating systems for smartphones. The use of mobile phones has progressed significantly. It is established which operating system is the most common, as well as which factors influence the purchasing decisions of customers. The dominance of Apple's iOS with its iPhone series was threatened by competition from Google's Android operating system (Voskoboynikov et al., 2021). A growing number of individuals are storing both personal and non-personal information on their operating systems. To accomplish this, a mobile operating system needs to be developed that has improved security. Both Android and iOS are well-known mobile operating systems that may be found on smartphones. Android is an operating system that relies on open source, while iOS is known for its sophistication and safety. The precautions Apple takes to protect user-information outperform those taken by Android. In the consideration of customer opinion on the smart phone, a large consideration is on the iOS, and it is because the security system of Apple is much better than the Android smartphones and, in those operations, these are considered to be very effective as it has worked on making the customer satisfaction on, the main approach of usage (Yao et al., 2018).

Some people are against Apple products due to their price, and they claim that it is very high compared to other Android products in the market (Geradin and Katsifis, 2021). It is evident that both Android and iOS have their pros and cons, but when it comes to security, iOS is a clear winner. Apple takes security very seriously and has been successful in protecting its user data (Bai et al., 2016). Android, on the other hand, has not been as successful in this regard. Moreover, there is high potential malware and viruses attacks on Android compared to iOS (Geradin and Katsifis, 2021). It is important

to understand the risks linked with each platform before choosing one.

3.5 OS Security

Operating system security is important for the development of mobile apps. The risks associated with both iOS and android platform needs to consider before deciding which one to use (Hussain et al., 2018). Operating system is crucial to store the personal information on smartphones. Besides, mobile devices are increasingly being used for business purposes, hence, businesses must use the potential mobile platform to protect their data (Dai et al., 2017).

Android, developed by Google, is based on the Linux kernel and designed primarily for touchscreen mobile devices such as smartphones and tablets (Hussain et al., 2018). It is available as an open-source platform, which means that anyone can develop and distribute Android apps. The disadvantage of the Android is that it can be difficult to control malicious applications. Android is used on different types of devices, which makes it difficult to provide consistent security. iOS is a mobile operating system developed by Apple (Dai et al., 2017). iOS works on a closed source platform, which means that only Apple can develop and distribute iOS apps. It is beneficial to control the risks of malicious apps. iOS is also designed to work only on Apple devices, which makes it easier to provide consistent security across all devices. Both Android and iOS have their security mechanisms to protect user data.

Android uses a permission-based security model, where, apps request permission to access sensitive data (Arslan et al., 2019). It is beneficial to protect the unauthorised access to data. However, users must be careful about which apps they install. iOS is based on a sandbox security model, where each app is isolated from other apps. It is beneficial to prevent data leakage between apps. Android on the other hand is based on open-source model (Garg and Baliyan., 2021). Anyone can develop and distribute Android apps. It can be difficult to control what apps are available, and some may be malicious.

3.6 Theoretical Foundation and Framework

The theoretical foundation is based on the User Experience (UX) Framework. The research revolves around the mobile software user experience for both iOS and Android platforms, where usability, identification and value are known as the crucial dimensions for the study.

Usability: The concept of usability a fundamental aspect of perceived value which describe how effectively users can interact with and extract value from digital products (Kaltum, Rimadina & Zusnita, 2018). It is considered relevant while adapting new technology like smartphones, tablets, and laptops during the pandemic (Alshurideh et al., 2019; Nagyu, 2018). In the framework, **usability** assesses how easily and effectively users can navigate, interact with, and achieve their goals within the software. It involves considerations of efficiency, effectiveness, and learnability (Zhou and Jiao, 2014).

Identification: The software identification is another crucial aspect in this regard. Understanding users' perceptions regarding software identification (iOS and android) reinforces the importance of software and users' experience (Nagy, 2018). Identification is distinct characteristics and identity of the software, including its branding, reputation, and market presence, can significantly impact the user's overall experience (Han et al., 2021).

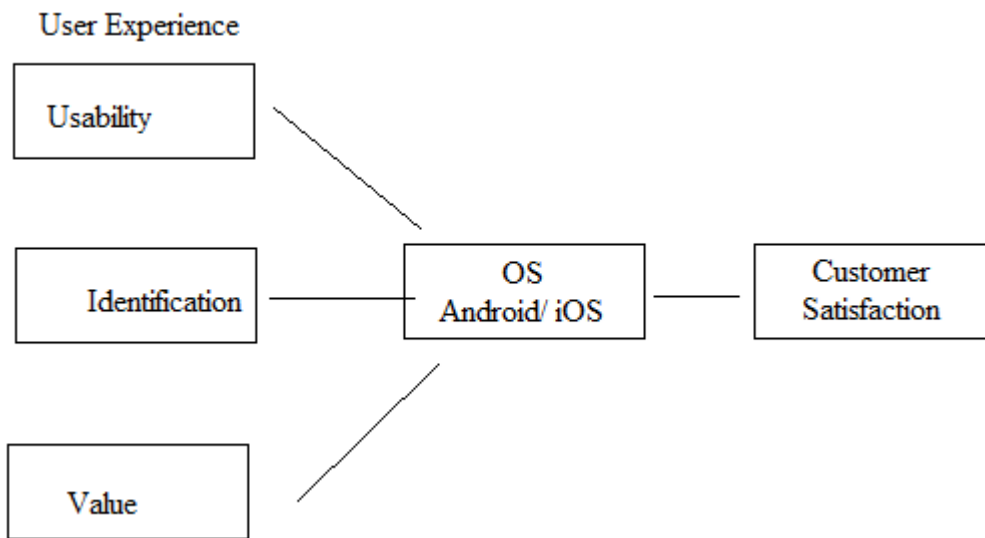
Value: The concept of value is tightly intertwined with benefits, qualities and satisfaction of users with software. The value users associate with a digital product have influences their overall satisfaction (Ceci, 2022). This dimension is relevant in the context of Android and iOS mobile software. Users have distinct preferences; for example, Android offers configurability. On the other hand, iOS excels in application security (Alshurideh et al., 2019). Value represents the perceived benefits, usefulness, and relevance of the software to the user. It encompasses aspects like functionality, features, and the problem-solving capacity of the software (Han et al., 2021).

Customer satisfaction reflects the overall contentment and fulfillment that users derive from their interaction with the software. It is a critical indicator of the quality of the user experience (Al-

Nabhani, & Wilson, 2018).

Based on the above discussion, the theoretical framework is based on three independent variables known as software usability, software identification and software value of user experience and one independent variable known as the customer satisfaction. The OS (Android/iOS) is also taken as a variable to analyze the relationship of these variables in case of Android or iOS. The framework is presented in the figure 1.

Figure 1: Theoretical Framework



Here are the proposed hypotheses derived from the discussion.

H1: There is a significant difference between usability, identification, and value (UX) among android and iOS users.

H2: Comparing Android and iOS software user experiences (UX) reveals differences in customer satisfaction levels.

3.8 Summary of the Chapter

In today's world, smartphones serve an important function. Mobile technology has now reached its most sophisticated stage, and the Android and iPhone operating systems are currently the most popular cell phones in the world. Any effective software must provide a satisfactory user experience.

This includes the software's features, breadth, and user experience. Despite user experience's popularity in practice and industry, there is no scientific consensus on a definition or theoretical model (UX). User experiences are continually shifting, making design and evaluation tough. Extra research must be done on user experience issues related to method selection and evaluation and development engagement. UX experts must also build strategies for addressing UX assessment problems. This component of the study combined findings on numerous UX features and dimensions with well-established evaluation approaches employing theories and models for the theoretical framework.

Chapter 4: Results

4.1 Introduction

The section discusses the results collected from the respondents in terms of demographic information, correlation and regression to test the hypothesis for iOS and Android Users. The results provide an overview of the outcomes derived from the research study. This section discusses several key aspects, including the analysis of demographic data, correlation and regression techniques, which is a mean to rigorously test the formulated hypotheses. This chapter discusses the critical insights of study in the broader context.

4.2 Descriptive Statistics

The first analysis is made in terms of the descriptive statistics of respondents. This analysis is made by considering frequency and percentage of all demographics. Table 1 presents a comprehensive snapshot of the study's participant demographics and the key information regarding the operating software preferences. 53.5% of the participants in the sample are female, while 46.5% identify as male. In terms of the gender, the majority of the participants (45.5%) fall within the age bracket of 25 to 40. Furthermore, 62.5% of the participants use iOS, while 37.5% use Android. This information may indicate potential differences in user experiences between these two platforms.

Table 1: Descriptive Statistics (n=200)

	Number	%
Gender		
Female	107	53.5
Male	93	46.5
Prefer Not to Say	0	0
Age		
Less than 25	39	19.5
25 to 40	91	45.5
41 to 55	58	29
55+	12	6
Operating Software		
Android	75	37.5
iOS	125	62.5

4.3 Correlation Analysis among Variables

Correlation analysis of variables indicate whether there is a relationship and if exists what is the magnitude of the relationship. The value closer to 1 indicates a strong positive relationship, whereas, the value closer to -1 shows strong negative relationship. The 0 correlation indicates that there is no relationship among variables. The results of correlation analysis are used to understand how these variables interacted and influenced one another. Table 2 presents the correlation analysis results to explore the relationships between selected variables. These variables assess the overall user experience and customer satisfaction for the user experience in terms of mobile software.

Table 2: Correlation Analysis

	Software Usability	Software Identification	Software Value	Customer Satisfaction
Software Usability	1	.575**	.311*	.092
Software Identification		1	.377	-.221**
Software Value			1	.128**
Customer Satisfaction				1
** . Correlation is significant at the 0.01 level (2-tailed).				
* . Correlation is significant at the 0.05 level (2-tailed).				

In the correlation analysis, software usability has a strong and positive correlation with software identification ($r = 0.575^{**}$); however, it is slightly moderate with software value ($r = 0.311^*$). The table indicates that there is no relationship between software usability and customer satisfaction ($r=.92$). The second variable of analysis is software identification which shows a moderate positive relationship with software value ($r=.377$); however, the relationship with customer satisfaction is moderately weak ($r=-.221^{**}$). The software value has a weak significant relationship with the customer satisfaction ($r=.128^{**}$).

4.3 Hypotheses Testing

H1: There is a significant difference between software usability, software identification, and software value (UX) among android and iOS users.

To test whether there is a significant difference between usability, identification, and value (UX) on customer satisfaction among Android and iOS users, a multivariate analysis of variance (MANOVA) is performed. MANOVA is appropriate in this case, because the researcher wants to compare the means of dependent variables across two or more groups (Android and iOS users). The results from MANOVA were used to determine whether there was a significant difference in software usability, identification, and value among Android and iOS users.

Table 3: MANOVA Test

Descriptive Statistics				
	Operating Software	Mean	Std. Deviation	N
Software Usability	Android	4.0844	.71470	75
	iOS	4.0053	.63215	125
Software Identification	Android	3.5333	.71028	75
	iOS	3.4400	.70913	125
Software Value	Android	3.5867	.43441	75
	iOS	3.5040	.46106	125

Levene's Test of Equality of Error Variances^a				
	F	df1	df2	Sig.
Software Usability	.258	1	198	.612
Software Identification	.510	1	198	.476
Software Value	1.219	1	198	.271
Tests the null hypothesis that the error variance of the dependent variable is equal across groups.				
a. Design: Intercept + OS				

Tests of Between-Subjects Effects						
Source	Dependent Variable	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	Software Usability	.293 ^a	1	.293	.665	.416
	Software Identification	.408 ^b	1	.408	.811	.369
	Software Value	.320 ^c	1	.320	1.573	.211
Intercept	Software Usability	3067.711	1	3067.711	6953.671	.000
	Software Identification	2279.408	1	2279.408	4527.313	.000
	Software Value	2356.760	1	2356.760	11572.356	.000
OS	Software Usability	.293	1	.293	.665	.416
	Software Identification	.408	1	.408	.811	.369
	Software Value	.320	1	.320	1.573	.211
Error	Software Usability	87.351	198	.441		
	Software Identification	99.689	198	.503		
	Software Value	40.324	198	.204		
Total	Software Usability	3343.889	200			
	Software Identification	2515.222	200			
	Software Value	2539.889	200			
Corrected Total	Software Usability	87.644	199			
	Software Identification	100.097	199			
	Software Value	40.644	199			
a. R Squared = .003 (Adjusted R Squared = -.002)						
b. R Squared = .004 (Adjusted R Squared = -.001)						
c. R Squared = .008 (Adjusted R Squared = .003)						

The hypothesis (H1) analyzes whether there is a significant difference in software usability, software identification, and software value (User Experience - UX) among Android and iOS users. Table 3 presents the results of the MANOVA test in terms of means, standard deviations, and sample sizes for each of the three UX factors. Levene's Test of Equality of Error Variances states that there are no significant differences in error variances for these factors between Android and iOS users.

The "Tests of Between-Subjects Effects" shows that there are no statistically significant differences between Android and iOS users, since the p-values are all greater than the conventional alpha level of 0.05. R-squared values is very low, which shows type of OS does not significantly impact customer satisfaction in these aspects. Based on this, H1 is rejected as there is no significant difference in UX factors between Android and iOS users with respect to customer satisfaction.

H2: Comparing Android and iOS software user experiences (UX) reveals differences in customer satisfaction levels.

To test this, independent T-test is used to compare the results of Android and iOS user experience in customer satisfaction levels. This analysis assessed whether there were significant differences in satisfaction levels between the two groups. Hence, it addresses the research question related to customer satisfaction. T-statistic was -1.384 (with equal variances assumed) and -1.382 (with equal variances not assumed), both with associated p-values greater than 0.05 ($p = 0.168$ and $p = 0.169$, respectively). The statistical tests confirmed this, with p-values above 0.05. It means that observed variations in satisfaction were not statistically significant. Hence, there is no strong evidence that Android and iOS users significantly differ in their levels of satisfaction with software UX.

Table 4: Independent T-Test

	N	Mean	Std. Deviation
Android	75	3.33	.75
iOS	125	3.49	.77

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means			
	F	Sig.	t	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Equal variances assumed	.013	.909	-1.384	.168	-.15600	.11272
Equal variances not assumed			-1.382	.169	-.15600	.11289

H2 revealed that there was no statistically significant difference in customer satisfaction levels between Android and iOS users. Android users had an average satisfaction score of 3.33, while iOS users scored slightly higher with an average of 3.49. The standard deviations for both groups were relatively similar, indicating consistent responses within each group.

Chapter 5: Discussion

The discussion section is based on two major parts. The first section discusses the results collected from respondents through survey and the second section discusses and evaluates the methods chosen for the research.

5.1 Results Discussion

This discussion interprets the study's findings in light of the existing literature and theoretical frameworks. It has a viable contribution to the dynamics that drive user satisfaction in the digital realm. Correlation analysis (Table 2) measured the associations among the variables. The findings showed a significant positive correlation between usability and customer satisfaction. These results are consistent with prior research in the field of user experience, where usability has repeatedly emerged as a pivotal factor influencing user satisfaction. Scholars such as Adekotujo et al., (2020) and Badran & Al-Haddad (2018) have highlighted the importance of usability in shaping user perceptions and contentment with digital products.

Furthermore, the positive correlation between software value (SV) and customer satisfaction (CS) ($r = 0.462$, $p < 0.01$) aligns with previous studies emphasizing the role of perceived value in enhancing user satisfaction. H1 indicates that usability, identification, and value collectively influence customer satisfaction. Several studies have emphasized the pivotal role of usability in shaping user perceptions and contentment with digital products. Scholars such as Bollini (2017) and Ribeiro et al., (2018) have discussed the impact of usability on user satisfaction.

H2 investigates whether user experiences (UX) on Android and iOS platforms. This hypothesis aligns with the literature regarding the differences in user experiences between these two prominent mobile operating systems. Existing studies, such as Smith et al. (2019) and Kim & Shin (2020), have explored user preferences and experiences on Android and iOS platforms. They highlight that users often have distinct preferences, and these preferences may impact their satisfaction levels. The analysis

for H2, using independent t-tests, shows that there is no statistically significant difference in customer satisfaction levels between Android and iOS users. This finding contradicts some prior research, suggesting that satisfaction levels may not differ significantly between the two user groups.

Here are some potential limitations which could have impact the results. The questionnaire relied on self-reported responses from participants. This approach might have led to some biases in the results, because, participants might have provided manipulated answers. Implementation of qualitative methods like interviews could have offered a more in-depth understanding of user preferences and experiences.

The study's sample size of 200 participants, which could represent a very small population. The sample composition was not balanced between Android and iOS users. iOS users in our sample size were 67.5%. This imbalance could have influenced the results, as user experiences may differ between the two platforms. There was need to consider the equal respondents for a more meaningful interpretation Another limitation is the cross-sectional design, which restricts the study's ability to infer causality. While correlations and regression analysis can reveal associations, they do not establish a cause-and-effect relationship. Longitudinal research designs, tracking participants over time, could provide more robust insights into the causal links between variables.

5.2 Method Discussion

The selection of research methods for this study is based on the survey data, where the information was collected from 200 participants. The quantitative measure is used to examine the relationships among the variables of interest. The quantitative analysis allowed for a precise relationships analysis among the variables. Ribeiro et al., (2018) said that this quantitative approach was particularly beneficial in quantifying the impact of usability, identification, value, and customer satisfaction which has offered a clear and quantifiable insights.

Secondly, the study from a large sample size of 200 participants enhanced the generalizability

of the findings. A larger sample size increases the statistical power and the validity of the conclusions drawn. Thirdly, it used the standardized survey instruments to collect data, which facilitated comparability with previous research. This standardized approach ensures that the results can be situated within the broader context of user experience studies and contributes to the cumulative knowledge in the field.

However, several limitations should be acknowledged. The study exclusively relied on self-reported survey data, which may introduce response biases and social desirability effects. Participants might provide answers that they believe are socially acceptable rather than reflecting their genuine opinions and experiences.

Furthermore, while the study aimed to explore differences in user experiences between Android and iOS users, it did not delve into the underlying reasons behind these differences. Qualitative research methods, such as interviews or focus groups, could have enriched the understanding of user preferences and experiences. The questionnaire approach is used which could have several advantages and disadvantages. Few questions in the questionnaire were not somehow achieving the purpose of this research. The questions should have asked in a way that it directly answers the research questions. For example, usage of the words “Usability, identification and value” must be avoided or needed to be used in a simpler way so the respondents could understand the questions clearly and ultimately to avoid ambiguities. The participants might not have provided the correct answers, potentially impacting the validity of the data. In future research, a mixed-methods approach could provide a more comprehensive understanding of user experiences. A more representative sample of Android and iOS could be used to reflect the market share of these platforms. The use of standardized survey instruments facilitated comparability with previous research.

In conclusion, this study successfully achieved its primary purpose of investigating the relationships between usability, identification, value, and customer satisfaction in the context of mobile

operating systems. The findings corroborate and extend existing literature, underscoring the pivotal roles of usability and value in enhancing user satisfaction.

Chapter 6: Conclusions and Further Research

6.1 Conclusions

RQ1: How does software user experience (UX) impact customer satisfaction among mobile phone users?

This study has provided valuable insights into the factors influencing customer satisfaction within the context of mobile operating systems, thereby contributing significantly to the problem statement articulated at the outset. Our findings affirm that there exists a positive correlation between usability and customer satisfaction, as well as a similar positive association between software value and satisfaction. These results have enhanced the usability and perceived value of mobile operating systems can lead to heightened user satisfaction. These results are aligned with the problem statement's focus on the relationships between these variables.

RQ2: How do Android and iOS users perceive and compare the UX of their respective platforms?

Furthermore, this study discusses the differences in satisfaction levels between Android and iOS users. While both platforms offer distinctive user experiences, hence, understanding the preferences and satisfaction levels has implications for developers and designers to cater to diverse user bases. The implications offer practical value to mobile operating system developers, designers, and marketers. Additionally, understanding the differing satisfaction levels among Android and iOS users can guide marketing efforts and inform user experience design decisions for each platform.

RQ3: What specific aspects of software user experience (UX) influence customer satisfaction among Android and iOS users?

The specific aspects/ factors the research have discussed are software usability, software identification and software value. These are defined as the pillar of the research which are considered crucial to influence the customer satisfaction among android and iOS users. The role of usability and perceived value in shaping customer satisfaction is importance. Software developers can prioritize these

aspects in their product development strategies. The research results were insufficient in proving that these dimensions of UX have really an impact on the customer satisfaction, because, both of our hypotheses are rejected. This could be due to poor representation of our sample size; another reason could be that android and iOS users need to have an equal representation in the results. The smaller android users' size could also have impacted the research results. Furthermore, due to the lack of relevant questions in the questionnaire the findings could not lead to some valuable insights about this research question.

6.2 Practical implications

The practical implications of this research study are for its different stakeholders. Firstly, **mobile manufacturers and developers**, particularly those working on Android and iOS platforms, gain a deeper understanding of how software User Experience (UX) impacts customer satisfaction. They can prioritize UX enhancements in their products, leading to increased customer satisfaction, potentially resulting in higher sales and greater brand loyalty. **Businesses and entrepreneurs** in the mobile app and platform development sphere can draw significant lessons from this research.

Marketing professionals can leverage the study's findings to craft more effective messaging and campaigns. The superior UX in mobile devices is a key selling point for their products and services. Furthermore, this research underscores the importance of **investment in UX research and design**. Companies are encouraged to allocate resources to conduct UX studies and gather user feedback. The potential return on investment (ROI) in terms of increased customer satisfaction and market competitiveness is substantial. Lastly, **educational institutions** offering courses in UX design and mobile app development can use the research findings to update their curricula. They can better prepare graduates for careers in the mobile industry with the skills and knowledge necessary to thrive in this dynamic field.

6.3 Scientific Implication

Theoretical implications arising from this research study enrich the understanding of User Experience (UX) and contribute to the development of theoretical. Firstly, the study advances **UX theory** by analyzing the relationship between software UX and customer satisfaction in the dynamic mobile industry. This focused depth enhances the comprehension of how UX impacts user satisfaction, especially within a technological context.

Secondly, the research elevates the theoretical understanding of **platform-specific UX design principles** by comparing the UX of Android and iOS devices. It highlights the differences in design, navigation, and user interaction between these two major operating systems. The study discusses the theoretical concept that UX can serve as a substantial source of competitive advantage for businesses operating in highly competitive mobile markets.

Lastly, the study aligns with theoretical principles of **user-centered design** by underscoring the critical importance of tailoring mobile experiences to align with user needs and preferences. This perspective reinforces the theoretical foundations of user-centered design, which highlights its relevance and significance in the ever-evolving landscape of mobile technology and UX theory.

6.4 Further Research

Continuing research in this domain offers valuable opportunities to deepen the user experiences and customer satisfaction within the mobile operating systems. The insights garnered from this study serve as a solid foundation for future investigations. Firstly, conducting qualitative research, such as in-depth interviews and focus groups, can unravel the qualitative intricacies of user experiences, elucidating the underlying factors that influence preferences and satisfaction.

Furthermore, employing longitudinal research designs to monitor user experiences over time will provide insights into the dynamic nature of these relationships. Expanding the scope by comparing various mobile operating systems and their user bases, including emerging platforms, could yield comprehensive insights into user behavior and satisfaction. Cultural influences on these

dynamics warrant exploration through cross-cultural studies. Advanced analytical techniques, usability testing, and user-centric design approaches offer additional dimensions to investigate, providing actionable insights for developers and designers.

The future researchers need to select at least 1000 respondents (equal iOS and android users) to enrich the generalizability. This could be better to improve the research reliability. The larger sample size would increase the validity and statistical results would be more appealing. Secondly, the questionnaire needs to be adopted in a careful manner so that each question can relate to the purpose of the research and answers the research objectives. The best approach is the use of standardized survey instruments facilitated comparability with previous research. Besides, the future researchers can analyze the results from two to three time periods to analyze whether results remain consistent throughout or not. The existing research is cross-sectional and longitudinal research would improve the research reliability chances.

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Appendices

Appendix 1: Questionnaire

Demographic Information

Choose one option

Gender

- Male
- Female

Age group

- 1-Less than 30 years
- 2-Between 31-39 years
- 3-Between 40-49 years
- 4-50 years and above

Mobile you currently use

- Android
- iOS

Research Information

Please select option 1 to 5, whereas, 1= strongly agree, 2=agree, 3=Neutral, 4=disagree and 5= strongly disagree

	1	2	3	4	5
Customer Satisfaction					
The overall satisfaction of users significantly impacts the software's success.					
User satisfaction is influenced by their experience with the software.					
The satisfaction of users is closely tied to their interactions with the brand.					
The quality of the user experience can significantly impact user satisfaction.					

Software Usability					
Usability is primarily about users successfully completing tasks within the software.					
A pleasant user feeling from using the software contributes to its usability.					
Ineffective usability can lead to user frustration and dissatisfaction.					
Software Identification					
Strong software identification enhances user attachment to the software.					
Software identification contributes to users' perception of software quality.					
Software identification improves users' recognition of software features and capabilities.					
Software Value					
The effective operation of the software enhances its overall value.					
Customer feedback plays a significant role in determining the value of software.					
Users place higher value on software when it reduces stress and trouble during use.					