

Satisfaction on Use of Android Operating System in Kathmandu Valley

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Abstract

The study examines satisfaction on use of android operating system in Kathmandu valley. User satisfaction on android operating system is dependent variables. The selected independent variables are performance, app availability, user interface, security and system update. The primary source of data is used to assess the opinions of respondents regarding satisfaction on use of android operating system in Kathmandu valley. The study is based on primary data of 165 respondents. To achieve the purpose of the study, structured questionnaire is prepared. The correlation and multiple regression models are estimated to test the different user satisfaction on use of android operating system in Kathmandu valley.

The result shows that performance has a positive impact on user satisfaction on android operating system. It indicates that higher performance leads to increase in user satisfaction on android operating system in Kathmandu valley. Similarly, app availability has a positive impact on user satisfaction on android operating system. It shows that increase in app availability leads to increase in user satisfaction on android operating system. Likewise, user interface has a positive impact on user satisfaction on android operating system. It implies that better the user interface higher would be the user satisfaction on android operating system in Kathmandu valley. Further, security has a positive impact on user satisfaction. It indicates that higher the security, higher would be the user satisfaction on android operating system. Moreover, system update has a positive impact on user satisfaction on android operating system. It states that system update practices leads to increase in the level of user satisfaction on android operating system.

Keywords: performance, app availability, user interface, security, system update, user satisfaction

1. Introduction

The Android Operating System is an open-source, Linux-based operating system primarily designed for mobile devices such as smartphones, tablets, smart watches, and more. Android has since become the most widely used mobile operating system in the world. Android is one of the most widely used operating systems in the world. This Linux-based operating system is intended for mobile devices such as smartphones and tablet computers. Android OS is known for its flexibility, wide device support, and extensive app ecosystem, making it a powerful and adaptable operating system for mobile devices. Android provides an open platform for developers to create various applications for use on mobile devices (Kilis *et al.*, 2022). Android has evolved significantly since its inception, with multiple versions improving functionality, user experience, and security. Its open-source nature facilitates developers to innovate and customize applications, catering to diverse user needs (Rugiya *et al.*, 2020). Haris *et al.* (2018) stated that android goals is to provide a user-friendly platform that supports multiple hardware and software configuration. Based on the Linux kernel, Google developed an operating system for mobiles. The android operating system is primarily designed for smartphone devices which implement a touch screen input interface. However, its widespread market adoption and cost-effectiveness make it an ideal platform for mobile health systems, allowing continuous monitoring, data analysis, and remote communication of physiological parameters with high precision and reliability (Lou *et al.*, 2013). Abildinova *et al.* (2016) concluded that the role of android in education, specifically focusing on a mobile application called the educational process remote management system.

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Pon *et al.* (2014) studied that the android and the demise of operating system-based power: Firm strategy and platform control in the post-PC world. The study found that the rise of android marked a shift in the mobile industry's control points, moving away from the operating system as the primary bottleneck. Companies like amazon and xiaomi leveraged android's open-source nature to build proprietary platforms, such as amazon's fire OS and xiaomi's miui, while Google retained control through Google play services. Similarly, Wukkadada *et al.* (2015) analyzed that the mobile operating system: Analysis and comparison of android and IOS. The study stated that android is considered as an OS as well as the platform for software. The android operating system for mobile is based on light weight Linux OS and it was developed by Google. Likewise, Sánchez-Rodríguez *et al.* (2023) examined that the designing an informative app for neuro rehabilitation: A feasibility and satisfaction study by physiotherapists. The study found that satisfaction with the android operating system is influenced by its flexibility, accessibility, and vast ecosystem of applications. Android's open-source nature allows developers to create diverse apps tailored to various user needs, enhancing usability. Further, Lynn *et al.* (2020) evaluated that the increasing user satisfaction of mobile commerce using usability. The study revealed that user satisfaction with android operating systems is influenced by usability factors, including ease of use, efficiency, and functionality. Applications that are intuitive, fast, and provide clear, responsive features enhance user experiences.

Malhotra (2014) examined that the comparative study between the android and Symbian operating systems. The study concluded that android's flexibility, faster development process, and user-friendly features contributed to its widespread adoption, while Symbian's outdated architecture and limited application ecosystem led to its decline. Similarly, Rattanachai *et al.* (2015) investigated on development of thai rice implantation recommend system based on android operating system. The study found that alert to rice cultivation in this prototypes model for the ongoing improvement of the thai rice implantation recommend system based on android operating system and this model can be beneficial to disseminate information about young famer so that user can be aware of the treatment of the rice in Thailand. Likewise, Pandey and Nakra (2014) investigated on consumer preference towards smartphone brands, with special reference to android operating system. The study found that android and iOS are the most preferred OS, while Samsung is the highest preferred brand to be selected for an android platform. Further, Hantono and Zainuddin (2017) examined factors of affecting for customer satisfaction on Samsung mobile of android type: A case study on faculty of economics' Students at university of prima Indonesia in Medan. The study found that factors such as product performance, service quality, and features had a significant impact on customer satisfaction. However, the satisfaction with android operating system use is influenced by accessibility, usability, and overall user experience, particularly for users with disabilities. Android's accessibility options, including talkbacks, magnification gestures, and text-to-speech, have improved over time, providing a customizable experience for users with unique needs (Morris and Mueller, 2014).

Namwong and Waythongkhum (2021) studied that the designing of infographic via android operating system application for royal graduation ceremony of Ramkhamhaeng University. The study demonstrated that using an android app with well-designed infographics can enhance user understanding and satisfaction during formal events like graduation ceremonies. Similarly, Bagga *et al.* (2016) analyzed that an investigative study of the mobile operating system and handset preference. The study found that android is vigilant of all the

upcoming competition it might get from branded handset manufacturers, as they are teaming up with other mobile OS. Likewise, Rini *et al.* (2022) examined on augmented reality (AR) technology on the android operating system in human respiratory system. The study found that AR Sinaps can be appropriately operated on the android system and plays a role in providing a better visualization effect on observing the tissue structure of the organs that make up the respiratory system in humans. Nazarwin *et al.* (2024) examined on exploring community satisfaction in building an innovative android-based mobile survey application for people travelling to Mentawai Island. The study found that aimed at improving the quality of transportation services and the overall passenger experience. Mahalakshmi and Kavitha (2021) investigated on a comparative study on customer satisfaction towards android operating system and iPhone operating system in mobile phone. The study concluded that the IOS mobile operating system of Apple Inc. provide more security by supporting its Sandbox architecture (ICloud) for the apps. Android operating system is user friendly, customizable and modest compared to IOS.

In the context of Nepal, Pokharel *et al.* (2022) analyzed that the awareness, acceptability, and satisfaction of tele dermatology consultation among social-media users in Nepal. The study concluded that to identify the awareness, acceptability, preferred technical tools, willingness to use, comfortability, and satisfaction of tele dermatology among social-media users in Nepal. Similarly, Shrestha *et al.* (2022) assessed that the environmental justice in real time: a pilot study using digital participatory method in the global south, Nepal. The study explored that the feasibility of using ecological momentary assessment through smartphones to assess environmental justice in Nepal. The study also highlighted that individuals' perceptions of fairness and environmental exposures vary within and across participants, depending on exposure types. Likewise, Poudel (2019) indicated that mobile payment systems in Nepal, many of which operate on android operating system, experienced significant growth during the covid-19 pandemic. Further, Poudel (2024) studied that the augmented reality navigation on android: Challenges and solutions. The study highlighted that the augmented reality navigation system developed for android significantly enhances user satisfaction by providing an intuitive and immersive navigation experience. Moreover, Pokhrel *et al.* (2020) investigated that the privacy-aware autonomous valet parking: Towards experience driven approach. The study found that privacy aware automated valet parking (AVP) system that utilizes mobile devices, including smartphones, for user interaction and control over autonomous vehicles during the parking process. The study also highlighted that the importance of seamless user experience through mobile applications, typically downloaded from platforms like Google play. However, Parajuli (2016) examined mobile learning practice in higher education in Nepal. The study found that 82% of students used mobile devices for learning outside the classroom.

The above discussion shows that the empirical evidences vary greatly across the studies concerning the satisfaction on use of android operating system. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The main objective of the study is to analyze the user satisfaction on use of android operating system in Kathmandu Valley. Specifically, it examines the relationship of performance, app availability, user interface, security, system update on android operating system in Kathmandu Valley.

The remainder of this study is organized as follows: section two describes the sample, data, and methodology. Section three presents the empirical results and final section draws the conclusion.

2. Methodological aspects

The study is based on primary sources of data which were gathered from 3 different districts of Kathmandu valley. For primary data a structured questionnaire was used. This study contains a sample of 3 of Kathmandu valley whose respective data are collected from a total of 165 respondents. The respondents' views were collected on performance, app availability, user interface, security and system update.

The model

The model used in this study assumes that user satisfaction depends upon service provided by android operating system. The dependent variable selected for the study is user satisfaction. Similarly, the independent variables are performance, app availability, user interface, security and system update. Therefore, the model estimated in this study is stated as follows:

$$US = \beta_0 + \beta_1 P + \beta_2 A + \beta_3 U + \beta_4 S + \beta_5 SU + e$$

Where,

US=User satisfaction

P= Performance

A= App availability

U= User interface

S=Security

SU= System Update

User satisfaction was measured using a 5-point Likert scale where respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include "I am satisfied with the performance of my android device in handling everyday tasks", "The android operating system meets my expectations for smooth and fast performance" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.894$).

Performance was measured using a 5-point Likert scale where respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include "Android device performs consistently well across all applications", "Regular android updates improve the overall performance of my device", and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.0.869$).

App availability was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include "The wide availability of apps on the Google Play Store increases my satisfaction with Android", "Frequent updates to apps improve my satisfaction with Android", and so on. The reliability of the items was measured by

computing the Cronbach's alpha ($\alpha = 0.902$).

User interface was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include "The overall design and layout of the android interface enhance the satisfaction with the operating system", "The availability of multiple language and accessibility options on Android enhances the satisfaction" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.884$).

Security was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include "I feel secure using android devices for online transactions", "android's app permission system ensures that my personal data remains protected", and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.884$).

System update was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include "I feel confident in using android devices due to their robust security features", "I feel satisfied with the frequency of android system updates", and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.882$).

The following section describes the independent variables used in this study along with the hypothesis formulation.

Performance

Android OS performance refers to how efficiently and smoothly the Android operating system runs on a device, including factors like speed, stability, battery life, and multitasking ability. Performance refers to the usability and efficiency of user interfaces (Kurosu and Kashimura, 1995). Likewise, Performance is defined as the degree to which individuals use information and communication technologies (ICT) to enhance their work tasks. This includes aspects like increased productivity, improved efficiency, innovative task completion, and effective decision-making (Tarafdar *et al.* 2010). Ferreira *et al.* (2020) revealed that usability mechanisms can improve performance without degrading user experiences. (Wieder *et al.*, 2012) revealed that performance in the context of BI systems is to provide high-quality, relevant, and actionable data that enables faster, more accurate, and well-informed decision-making. This, in turn, aims to improved user satisfaction. Isaac *et al.* (2018) found that increased internet usage positively influences performance by improving communication, enhancing knowledge acquisition, and aiding in better decision-making. Ameen *et al.* (2020) measuring performance is to assess the impact of service quality and user satisfaction on the overall effectiveness of smart government applications. Based on it, this study develops following hypothesis:

H₁: There is a positive relationship between performance and user satisfaction.

App availability

App availability refers to the ease with which users can find desired applications in a mobile app store and the study also found that improved discoverability leads to higher user satisfaction (Song *et al.*, 2014). Durelli *et al.* (2018) revealed that maintaining app availability involves not only ensuring the app can be downloaded but also guaranteeing consistent

performance and updates that do not negatively impact user experience. Bender and Bender (2021) stated that greater app availability positively influences both application success (e.g., downloads, ranking) and customer satisfaction by reducing barriers to access and enhancing the user experience. Redjeki (2024) app availability in the context of mobile banking refers to the capacity of a mobile banking application to provide uninterrupted access to banking services anytime and anywhere. Siyal *et al.* (2021) app availability refers to the ability of these apps to provide round-the-clock access to services, ensuring that users can book taxis anytime and anywhere. App availability refers to the technical functionality and reliability of the application in performing its intended operations. Prasetyo *et al.* (2023) found that TikTok user satisfaction and its impact on continuous intention to use the application, which is related to app availability in terms of how accessible and engaging the app is for users. Based on it, this study develops following hypothesis:

H₂: There is a positive relationship between app availability and user satisfaction.

User Interface

User interface refers to the graphical structures and control mechanisms, such as menus, that allow users to interact with a system (Findlater and McGrenere, 2008). User interface relates to the design and functionality that allow users to interact effectively with a system or application. It focuses on ensuring efficiency, effectiveness, and satisfaction for users as they perform specific tasks (Ferreira *et al.*, 2020). Moise and Atkins (2005) found that the stages interface, a scenario-based user interface for radiology workstations, significantly outperformed the traditional free user interface (FUI). Sindhuja and Dastidar (2009) indicated that user interface (UI) refers to the design and layout of a system that facilitates interaction between humans and computers. Kvale *et al.* (2020) stated that user interface refers to the aspects of a chatbot system that allow users to interact with it, which includes the design and functionality provided to meet user needs and expectations. UI in the context of chatbots is guided by factors such as language processing, intent handling, and the ability to deliver efficient, user-friendly interactions. Yigitbas *et al.* (2020) stated that user interface serves as the medium through which users interact with the application. Thinnukool and Kongchouy (2017) revealed that dynamic screens appeal to younger users for better interaction, while older users prefer static designs. Clear text, readable fonts, accessible menus, and proportional layouts enhance satisfaction. Based on it, this study develops following hypothesis:

H₃: There is a positive relationship between user interface and user satisfaction.

Security

Security refers to freedom from danger, risk, or doubt during service processes. It is a significant component of website quality, addressing customer concerns about personal data protection, privacy, and the reliability of online platforms (Natarajan *et al.*, 2012). Khajouei and Farahani (2019) revealed that security in the context of the social security electronic system and hospital information systems is implicitly linked to usability attributes like effectiveness, efficiency, and user satisfaction. Lee *et al.* (2008) found that security significantly impacts mobile internet user satisfaction by addressing privacy concerns and data protection. Alalwan *et al.*, (2019) found that the study found that perceived security significantly influences user satisfaction with mobile stores. Additionally, Nusifera *et al.* (2020) revealed that security was identified as an important variable positively affecting user satisfaction. Based on it, this study develops following hypothesis:

H₄: There is a positive relationship between security and security.

System update

A system update refers to a process by which mobile applications undergo modifications to improve functionality, fix bugs, enhance user experience, or address security vulnerabilities. Velichety and Durcikova (2012) revealed that users are more likely to update their system if they perceive outdated versions as significant security threats, such as being susceptible to hacking, malware, or loss of personal information. Lin *et al.* (2011) found that system quality positively and significantly influences online user satisfaction. Yang *et al.* (2018) found that system updates have minimal overall impact on android apps, affecting a small percentage of APIs and classes. Larger apps are less affected, enabling targeted testing to reduce time and effort for maintaining app functionality. Farhang *et al.* (2018) revealed that security is a significant motivating factor for updates, as they often address vulnerabilities and enhance system protection, though this is sometimes undervalued by users. Based on it, this study develops following hypothesis:

H₅: There is a positive relationship between system update and user satisfaction.

3. Results and discussion

Correlation analysis

On analysis of data, correlation analysis has been undertaken first and for this purpose, Kendall's Tau correlation coefficients along with mean and standard deviation has been computed and the results are presented in Table 1.

Table 1

Kendall's Tau correlation coefficients matrix

This table presents Kendall's Tau coefficients between dependent and independent variables. The correlation coefficients are based on 165 observations. The dependent variable is US (User satisfaction). The independent variables are P (Performance), A (App availability), U (User interface), S (Security), SU (System update).

Variables	Mean	Std. Deviation	US	P	A	U	S	SU
US	4.092	0.856	1.000					
P	4.074	0.839	.539**	1.000				
A	4.0215	0.939	.568**	0.674**	1.000			
U	4.087	0.889	.547**	.661**	.744**	1.000		
S	4.072	0.910	.605**	.624**	.666**	.714**	1.000	
SU	4.058	0.905	.595**	.664**	.641**	.656**	.678**	1.000

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent levels respectively.

Table 1 shows the Kendall's Tau correlation coefficients of dependent and independent variables. The study shows that performance is positively correlated to user satisfaction. It means that increase in performance leads to increase in user satisfaction. Similarly, there is a positive relationship between app availability and user satisfaction. It means that increase in app availability leads to increase in user satisfaction. Likewise, user interface has a positive relationship with user satisfaction. It shows that better user interface leads to increase in user satisfaction. Furthermore, there is a positive relationship between security and user

satisfaction. It indicates that increase in security leads to increase in user satisfaction. Moreover, system update has a positive relationship with user satisfaction. It indicates that regular system update leads to increase in user satisfaction.

Regression analysis

Having indicated the Kendall’s Tau correlation coefficients, the regression analysis has been carried out and the results are presented in Table 2. More specifically, it shows the regression results of performance, app availability, user interface, security and system update on satisfaction on use of android operating system in Kathmandu Valley.

Table 2

Estimated regression results of performance, app availability, user interfaced, security and system update on user satisfaction.

The results are based on 165 observations using linear regression model. The model is $US = \beta_0 + \beta_1P + \beta_2A + \beta_3U + \beta_4S + \beta_5SU + e$, where the dependent variable is US (User satisfaction). The independent variables are P (Performance), A (App availability), U (User interface), S (Security), SU (System update).

Intercept	Regression coefficient of					Adj. R_bar²	SEE	F-value
	P	A	U	S	SU			
0.768 3.86	0.816 (17.05)**					0.639	0.5147	290.705
1.197 6.624		0.72 (16.441)**				0.622	0.5267	270.304
1.224 5.678			0.702 (13.608)**			0.529	0.5876	185.166
1.18 5.924				0.715 (14.971)**		0.576	0.5572	224.146
1.192 5.913					0.715 (14.745)**	0.569	0.5621	217.404
0.66 3.57	0.476 (6.181)**	0.372 (5.403)**				0.692	0.4752	185.094
0.668 3.532	0.482 (5.835)**	0.383 (4.4)**	0.019 (0.21)			0.69	0.4767	122.683
0.582 3.187	0.446 (5.597)**	0.333 (3.943)**	0.238 (2.309)*	0.327 (3.918)**		0.715	0.4567	104.053
0.575 3.153	0.408 (4.761)**	0.325 (3.843)**	0.264 (2.504)*	0.299 (3.452)**	0.101 (1.17)	0.716	0.4562	83.709

Notes:

- i. Figures in parenthesis are t-values
- ii. The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- iii. User satisfaction is the dependent variable.

The table 3 shows that the beta coefficients for performance are positive with user satisfaction. It indicates that performance has a positive impact on user satisfaction. This finding is consistent with the findings of Ferreira *et al.* (2020). Similarly, the beta coefficients for app availability are positive with user satisfaction. It indicates that app availability has a positive impact on user satisfaction. This finding is consistent with the findings of Bender and Bender (2021). Likewise, the beta coefficients for user interface are positive with user satisfaction. It indicates that the user interface has a positive impact on user satisfaction. This finding is consistent with the findings of Moise and Atkins (2005). Further, the beta coefficients for security are positive with user satisfaction. It indicates that security has a positive impact on user satisfaction. This finding is consistent with the findings of Nusifera *et al.* (2020). In addition, the beta coefficients for system update are positive with user

satisfaction. It indicates that system update has a positive impact on user satisfaction. This finding is consistent with the findings of Farhang *et al.* (2018).

4. Summary and conclusion

The Android Operating System (OS) is an open-source mobile operating system developed by Google. It is primarily used in smartphones, tablets, and other devices like smart watches, TVs, and cars. Based on the Linux kernel, Android allows for high customization, offering a wide range of apps and features. It is the most widely used mobile OS worldwide due to its flexibility, diverse device compatibility, and access to the Google Play Store. Assessing user satisfaction with the Android Operating System (OS) in the Kathmandu Valley involves examining various factors, including demographic characteristics, brand preferences, and specific features of Android devices. In the Kathmandu Valley, Android users exhibit a diverse range of preferences and satisfaction levels. While many appreciate the customization and features offered by Android devices, issues related to performance and stability persist. Understanding these factors is crucial for manufacturers and developers aiming to enhance user experience in the region.

This study provides insightful information regarding satisfaction on android operating in Kathmandu Valley. The study analyzes various significant variables that could impact user satisfaction on android operating in Kathmandu Valley. The variables include how performance, app availability, user interface, security and system update influence user satisfaction on android operating system.

The study attempts to examine user satisfaction on android operating system in Kathmandu valley. The study is based on primary data with 165 respondents.

The major conclusion of the study is that performance, app availability, user interface, security and system update have positive impact on user satisfaction on android operating system in Kathmandu Valley. The study also concludes that performance is the most significant factor followed by app availability, security and system update that influence the user satisfaction on android operating system in Kathmandu valley.

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