The Impact of Usability, Security, and Service Quality on User Satisfaction and Experience in Digital Platforms: A Correlation Study

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Abstract

Background: In digital services, the user experience is shaped by essential elements such as usability, security, and service quality. Understanding how these factors impact satisfaction and the overall experience is vital for improving platform performance.

Objectives: This academic investigation seeks to explore and deeply understand the interconnections among usability, security, speed, service, satisfaction, and user experience. By elucidating how these variables contribute to satisfaction, the work tries to provide a view of the variables that shape user satisfaction as well as experience in digital platforms.

Methods: The study employed a rigorous methodology, conducting a comprehensive survey with 155 participants. The data obtained were then analyzed using the Mann-Whitney U test, the Kruskal-Wallis test, and Spearman's Rank-order correlation test. These tests were chosen for their ability to investigate the relationships among the variables under consideration, ensuring the dependability and accuracy of the research outcomes.

Results: Usability exhibited a noteworthy positive correlation with both satisfaction ($\rho = .677$, $p < 0.01$) and speed ($\rho = .665$, $p < 0.01$). Service quality demonstrated a robust correlation with satisfaction ($\rho = .798$, $p < 0.01$) as well as speed ($\rho = .767$, $p < 0.01$). Furthermore, user experience was significantly associated with security ($\rho = .664$, $p < 0.01$) and satisfaction ($\rho = .681$, $p < 0.01$).

Conclusion: This study's findings have practical implications that can empower decision-makers. It unequivocally indicates that enhancing usability and service quality are critical elements that fundamentally influence user satisfaction. Prioritizing these dimensions will significantly improve the overall user experience on digital platforms.

Keywords: Usability, Satisfaction, Service Quality, Mann-Whitney U test, Kruskal-Wallis test, Spearman's Rank-order correlation

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Introduction

The banking sector has now-a-day faced a remarkable turn due to the wave of electronic banking (e-banking). The digital age has profoundly altered the banking landscape, with electronic banking (e-banking) becoming an essential service platform (Hakizimana, Wairimu, & Stephen, 2023). Electronic banking provides many services, including online transactions, mobile banking, and digital account management, all designed to optimise customer convenience and operational efficiency (Drigă & Isac, 2014). This transition to digital platforms has engendered unparalleled convenience, operational efficiency, and consumer accessibility (Githuku & Kinyuru, 2018). Nevertheless, it raises significant questions concerning the overall effect of these regulations on consumer contentment. Consumer satisfaction is a critical performance measure (KPI) for financial institutions, owing to its direct relationship with client allegiance, retention rates, and competitive positioning in the economic landscape. The core expectation of this work is to find out the impact of e-banking services on customer expectations through Statistical analysis. The statistical approach allows you to measure the association between

several independent variables (i.e., service quality, ease of use, security, and customer support) with one dependent variable (customer satisfaction). This study aims to provide fruitful insight into electronic banking customer satisfaction and the factors of service quality, ease of use, security, and customer support. The results are expected to help provide financial institutions with guidance on honing their digital service offerings as they better meet the needs of consumers and ultimately raise overall levels of customer satisfaction. Further, comprehension of these interrelations postulates valuable implications for banks to enhance functioning in digital banking and better cater to customers' needs. The impact of this study's findings would provide necessary input into the bank electronic banking and customer satisfaction literature pool, substantiating its effects, which could be valuable to academic researchers and web bankers. These findings can also be used as valuable intelligence on which to base their digital services, helping banks better suit the needs and expectations of customers in an increasingly digitised world.

Problem Statement

Although electronic banking (e-banking) services have been quickly embraced, a notable disparity exists in comprehending their impact on customer satisfaction. Major banks are in the process of digitising their offerings (Wewege, Lee, & Thomsett, 2020). While many banks have invested heavily in digital infrastructure, customer ratings often indicate varying satisfaction levels with these offerings. The above-mentioned discrepancy suggests that what could affect customer satisfaction differs from one determinant to another within e-banking services. Furthermore, there is a dearth of extensive studies employing advanced statistical approaches such as multiple regression analysis to investigate these potential factors. Therefore, it is essential to recognise and evaluate the constituent parts of e-banking services that warrant significant attention in terms of customer satisfaction, eventually providing real-world recommendations for banks to improve their digital services and increase overall customer experience. Electronic banking encompasses services that facilitate customers executing financial transactions and accessing banking services via electronic mediums such as I-banking, M-banking, and ATM (Odhiambo & Ngaba, 2019).

The gap is seen in how e-banking services influence customer satisfaction. Notwithstanding substantial financial investments by financial Organizations in technology infrastructure, Customer approval levels reveal considerable variation, signalling that the multiple aspects of electronic banking services might have diverse impacts on customer satisfaction.

Review of Published Works

The literature analysis is based on the references below, describing the research methodology factors adopted and the dependent and independent variables.

Reference	Independent Variables	Dependent Variables	Method Employed
Efi et al., 2021	Digital marketing implementation	Consumer satisfaction	Correlation analysis
Kashif et al., 2021	E-Banking		
Lamsal, 2022	Factors affecting service quality	Loyalty and client satisfaction	Descriptive methodology
Komala & Kusnanan, 2019	Employed for Internet banking services	Customer satisfaction	
Egala et al., 2021	Quality in digital banking services	Customer satisfaction and retention	Structural equation model
Moudud-Ul-Huq, 2021	Mobile banking (MB)	Consumer satisfaction	
Al Karim & Habiba, 2020	Customer knowledge, orientation, technology capability	E-customer satisfaction and loyalty	
Gui et al., 2023	Quality security and privacy	Consumer satisfaction	

Chowdhury et al., 2023	E-Banking quality	Perceptions of banking consumers	Exploratory Factor Analysis
Toyon, 2023	Online banking practices	Adoption of Internet banking	
Handayani et al., 2022	E-learning and service quality	Customer satisfaction	Multiple linear regression analysis
Sadekin et al., 2019	Trust in e-banking	Customer's satisfaction	SPSS data analysis

The study of the published material matrix exposes several key recurring themes, including the following:

Theme 1: Electrical Banking Facilities and Client Feeling Satisfied

Farzana et al. (2022) conducted a descriptive investigation measuring the effect of online banking on the happiness of customers. Bekiris (2022) performed an inquiry including 237 Greek consumers to assess the impact of online banking services on happiness rates. Gautam & Sah (2023) studied structural equation modelling techniques to examine the causal relation between Internet banking services and consumer satisfaction. Shafee et al. (2022) conducted a regression model study to find the correlation between online banking and consumer satisfaction. Tyagi et al. (2022) deployed a test called the Chi-square test to examine how it relates to online banking services and satisfaction of thinking.

Theme 2: E-customer satisfaction and service quality

Regarding consumer satisfaction in the context of e-banking services, one of the most significant factors that are frequently investigated is the notion of service quality. Scholars have carefully studied a variety of quality services to assess how they reflect customer satisfaction.

Ansebo and Gaywala (2022) set up a SERVQUAL structure that involves parts such as reliability and quality of service to look at the customer's electronic satisfaction. Islam et al. (2023) engaged in a quantitative study that showed an important connection between the quality of digital goods and consumer happiness and loyalty. Alfarizi (2023) used an approach based on surveys to evaluate the influence of the digitalization of financial services on client satisfaction. A descriptive study was conducted by Hayat and Hossain (2023) to determine how client contentment within the electronic banking sector is affected by aspects related to service quality. Emilia and Sanjaya (2023) and Putri, Hendrayati, and Hurriyat (2022) conducted a regression analysis to determine the association between E-SERVQUAL and E-satisfaction aspects in the context of e-banking services and to review the link among the level of satisfaction regarding e-banking services. Poornima and Sridharan (2022) also employ regression modelling to explain the interaction between service quality and client satisfaction in electronic banking. Alkhaibari et al. (2023) used participatory mixed methods of inquiry to measure the consequence of multiple quality of service variables on customer happiness within the digital banking field.

Theme 3: E-service quality dimensions (security, usability, and trust)

The empirical research focused on particular elements of service quality, including faith, usability, and safety, as variables impacting customer satisfaction. Jahroh & Saptono (2023) use Structural Equation Modeling in LISREL software to evaluate the implications of the client experience, faith, effectiveness, and usefulness on customer happiness and retention. Gui et al. (2023) used SMART PLS and bootstrapping methods to explore the functions of information quality, security, and privacy in improving client satisfaction and loyalty. Firmansyah et al. (2022) reviewed e-service quality and e-trust to gather insights on customer satisfaction. CuSTOMER (2022) uses a model of structural equations (SEM) to examine the effects of perceived threat as well as perceived value on consumer happiness in the realm of online banking services.

Theme 4: Client Experience, loyalty, and the intent

This issue examines the extensive relationship between customer experience and loyalty in terms of satisfaction, focus retention, and behavioural objectives. Le (2022) surveyed to evaluate aspects of online banking practices on customer approval and loyalty. Almansour and Elkrghli (2023) utilised a method known as descriptive

research to examine the causal connection between online banking services and consumer satisfaction and loyalty. Jaiwani et al. (2022) used multiple and univariate regression analyses to determine the link between Internet banking services and client fulfilment and intentions.

Theme 5: The Effects of Technological Innovation and Safety Measures on Customer Satisfaction

The magnitude of technological factors, such as assurance, accessibility, and perceived confidentiality, has been thoroughly investigated in e-banking literature. Karim et al. (2022) analysed the level to which technology self-efficacy impacts consumer happiness, employing structural equation modelling as the study method. Mohanty et al. (2023) evaluated several technical frameworks (e.g., service quality, perceived usefulness, and perceived risk) to analyse their impact on consumer satisfaction. Gui et al. (2023) studied the impact of perceived privacy and security on changing levels of client satisfaction via a structural equation model. Wiharso et al. (2022) conducted quantitative research utilising a straightforward random sample technique to assess how it impacts product quality in digital banking on the happiness of consumers.

Theme 6: Demographic Influences and Consumer Behavior

Ultimately, demographic variables such as age, income, and digital literacy have been studied regarding how customers interact with e-banking services. Gowthaman (2020) applied regression analysis to assess the influence of marital status, gender, and account segmentation based on customer satisfaction with e-banking services. Mekonnen (2022) utilised a clarifying investigation approach to investigate the variation in online banking tasks across various demographic groups, emphasizing e-customer contentment and loyalty. Debnath and Chellasamy (2022) assessed the consequence of forming digital banking solutions on client happiness levels across different demographic segments.

Prior trials have exposed many facts about e-banking. However, they frequently lack a comprehensive analysis applying sophisticated statistical techniques such as Spearman's correlation, Mann-Whitney U test, and Kruskal-Wallis H test. This study attempts to determine and assess elements of e-banking offerings that specifically affect client contentment and provides practical suggestions for financial institutions that will improve online services and overall customer experience.

Sample Size and Sampling Framework:

The present study presents a careful pick of 155 participants through a Google form, applying the convenience sampling technique to gauge client contentment with digital banking services in the Mymensingh division of Bangladesh. This study explains the elements influencing customer satisfaction while enabling thorough statistical analysis. The chosen sample size guarantees enough statistical strength to recognise correlations between the independent factors (e.g., Usability, Security, Transaction Speed) and the dependent variable (e.g., Customer Satisfaction) while assessing the mediated impact of Customer Experience.

Sample Size and Sampling Technique:

Data analysis was carried out employing SPSS and other advanced statistical computing programs. Descriptive statistical parameters were obtained, to sum up the socioeconomic background of the people who responded along with crucial variables. Inferential statistical methods were employed to assess the postulated connections within the conceptual framework.

Descriptive Statistics for Participants

This section outlines the essential descriptive statistics related to demographic factors, including age, gender, educational level, housing status, monthly income, transaction participation, and usage frequency among 155 respondents.

01. Table: Descriptive Statistics with Category-based Variables

Variables	N	Mean	St. Deviation	Skewness	Kurtosis
Age respondent	155	40.19	6.827	-0.387	1.536
Gender respondent	155	1.25	0.435	1.156	-0.672
Education level respondent	155	1.92	0.529	-0.086	0.553
Accommodation	155	1.46	0.637	1.049	0.013
Monthly income	155	2.51	0.628	-0.913	-0.195
Deal transaction	155	1.59	0.556	0.224	-0.903
Frequency of usage	155	1.74	0.665	0.356	-0.767

The research had 155 individuals in total. The average age was determined at 40.19 years (SD = 6.827), with little negative skew, indicating a majority of older participants. The gender distribution was skewed towards males (mean = 1.25, SD = 0.44). The educational attainment was very equitable (mean = 1.92, SD = 0.53) signifies that the sample contains sufficient information about education. Accommodation variables (mean = 1.46, SD = 0.64) and transaction frequency (mean = 1.59, SD = 0.56) exhibited a positive skew, while the monthly income variable showed a negative skew (mean = 2.51, SD = 0.63) indicates that a minority of individuals enjoy higher incomes, whereas most people have seen lower incomes, boosting the mean. The frequency of usage displayed little inclination towards infrequent use (mean = 1.74, SD = 0.67) indicates Participants consume the offerings moderately, showing no notable tendency towards frequent or infrequent usage.

02. Table: Descriptive Statistics with Dependent Variables

Variables	N	Mean	St. Deviation	Skewness	Kurtosis
Usability	155	1.8677	0.67009	2.239	6.272
Security	155	2.3161	1.09557	0.794	-0.763
Speed	155	1.9516	0.72976	1.760	3.575
Service	155	2.0742	0.92546	1.404	1.445
Satisfaction	155	2.1075	0.88839	1.270	0.959
Experience	155	2.0806	0.72855	1.463	4.154

The investigation encompassed a total of 155 participants. The average scores for the variables were delineated as follows: Usability (mean=1.87, SD=0.67), Security (mean=2.32, SD=1.10), Speed (mean=1.95, SD=0.73), Service (Mean=2.07, SD=0.93), Satisfaction (mean=2.11, SD= 0.89), and Experience (mean=2.08, SD=0.73). A peaked distribution with prolonged tails characterising usability indicated that most respondents gave it lower marks. Usability showed a strong positive skew (2.24) and high kurtosis (6.27), which indicates limited variability with an abundance of low scores. The security displayed a slightly flatter distribution with a negative kurtosis (-0.76) and a minor positive skew (0.79), implying a more even distribution. The minor positive skew hints at more participants who examined security as below average, with responses distributed rather equally. Speed, Service, Satisfaction, and Experience all manifested positive skewness, with Speed (1.76), Service (1.40), Satisfaction (1.27), and Experience (1.46) indicating varying extents of rightward skew and peaked distributions. Speed possessed a high kurtosis (3.58), reflecting a pronounced peak alongside heavy tails, whereas the other variables presented moderate kurtosis values.

03. Table: Assessments of Normality

	Kolmogorov-Smirnov			Shapiro-Wilk		
Variables	Statistic	df	Sig.	Statistic	df	Sig.
Usability_mean	0.228	155	0	0.773	155	0
Security_mean	0.252	155	0	0.843	155	0
Speed_mean	0.267	155	0	0.813	155	0
Service_mean	0.300	155	0	0.814	155	0
Satisfaction_mean	0.297	155	0	0.835	155	0
Experience_mean	0.273	155	0	0.833	155	0

The Kolmogorov S and Shapiro-W tests assessed every variable's statistical significance. The results showed that the distribution of all reviewed variables (e.g., usability, security, speed, service, satisfaction, and experience) demonstrated an important deviation from the normal distribution, with the p-value below 0.001 for each of the tests across every variable (e.g., Usability: D (155) = 0.228, $p < 0.001$; W (155) = 0.773, $p < 0.001$).

These data indicate that the assumption of normalcy has been compromised, influencing the selection of subsequent analytical procedures. Non-parametric tests, like the Mann-Whitney U, Kruskal-Wallis H, and Spearman's rank-order correlation, are recommended as alternatives to parametric tests like t-tests or ANOVA. (Scientific European Federation of Osteopaths, no date)

04. Table: Mann-Whitney U Test Statistics by Gender

Variables	Mann-Whitney U	Wilcoxon W	Z	Sig. (2-tailed)
Usability_mean	1917.5	2697.5	-1.441	0.150
Security_mean	2213.5	2993.5	-0.203	0.839
Speed_mean	2167.5	2947.5	-0.399	0.690
Service_mean	2097.5	2877.5	-0.705	0.481
Satisfaction_mean	2062.5	2842.5	-0.841	0.400
Experience_mean	2158.0	8944	-0.456	0.648

Mann-Whitney U tests were administered to evaluate variances in usability, security, speed, service, satisfaction, and experience between male and female participants. The findings indicated no Statistically relevant distinctions between the two groups for any specific assessed variables: usability (U = 1917.500, p = 0.150), security (U = 2213.500, p = 0.839), speed (U = 2167.500, p = 0.690), service (U = 2097.500, p = 0.481), satisfaction (U = 2062.5, P = .400), and experience (U = 2158.000, p = 0.648). Based on the findings, the respondents' assessments of these attributes are not significantly influenced by gender.

05. Table: Mann-Whitney U Test Statistics by Accommodation

Variables	Mann-Whitney U	Wilcoxon W	Z	Sig. (2-tailed)
Usability_mean	1729.0	6289.0	-2.386	0.017
Security_mean	1722.0	6282.0	-2.425	0.015
Speed_mean	1511.0	6071.0	-3.363	0.001
Service_mean	1565.5	6125.5	-3.169	0.002
Satisfaction_mean	1480.0	6040.0	-3.501	0.000
Experience_mean	1713.0	6273.0	-2.577	0.010

Mann-Whitney U tests by accommodation revealed statistically significant differences among accommodation groups for all evaluated variables: usability (U = 1729.000, p = 0.017), security (U = 1722.000, p = 0.015), speed (U = 1511.000, p = 0.001), service (U = 1565.500, p = 0.002), satisfaction (U = 1480, P = 0), and experience (U = 1713.000, p = 0.010). Respondents' accommodation status significantly affects their perceptions of these qualities.

06. Table: Kruskal-Wallis Test Statistics by Education Level

Variable	Kruskal-Wallis H	df	Asymp. Sig.
Usability_mean	4.529	2	0.104
Security_mean	8.521	2	0.014
Speed_mean	2.608	2	0.271
Service_mean	3.935	2	0.140
Satisfaction_mean	4.341	2	0.114
Experience_mean	1.564	2	0.457

A Kruskal-Wallis H test by education revealed a statistically significant variance in security perceptions contingent upon education levels, χ^2 (2) =8.521, p=0.014. No statistically significant variances were tracked for usability (p=0.1404), speed (p=0.271), service (p=0.140), satisfaction (p=0.114), or experience (p=0.457). In short, education heavily influences perceptions of security, whereas perceptions of usability, speed, service, satisfaction, or experience are hardly affected.

07. Table: Kruskal-Wallis Test Statistics by Monthly Income

Variable	Kruskal-Wallis H	df	Asymp. Sig.
Usability_mean	19.558	2	0.000
Security_mean	16.563	2	0.000
Speed_mean	13.511	2	0.001
Service_mean	11.825	2	0.003
Satisfaction_mean	17.344	2	0.000
Experience_mean	7.844	2	0.000

The Kruskal-Wallis H test by monthly income indicates statistically significant variations among income groups for all assessed variables: usability χ^2 (2) =19.558, p=0.000, security χ^2 (2) =16.563, p=0.000, speed χ^2 (2) =13.511, p=0.001, service χ^2 (2) =11.825, p=0.003, satisfaction χ^2 (2) =17.344, p=0.000), and experience χ^2 (2) =7.844, p=0.000). The result shows respondent's assessments of every variable under investigation strongly influence their income.

08. Table: Kruskal-Wallis Test Statistics by Deal Transaction

Variable	Kruskal-Wallis H	df	Asymp. Sig.
Usability_mean	12.233	2	0.002
Security_mean	11.143	2	0.004
Speed_mean	7.124	2	0.028
Service_mean	6.621	2	0.036
Satisfaction_mean	5.898	2	0.052
Experience_mean	5.696	2	0.058

A Kruskal-Wallis H test by deal transaction finding indicated the presence of statistically significant discrepancies in usability χ^2 (2) =12.233, p=0.002), security χ^2 (2) =11.143, p=0.004, speed χ^2 (2) =7.124, p=0.028, and service χ^2 (2) =6.621, p=0.036). Conversely, no significant discrepancies were identified for satisfaction χ^2 (2) =5.898, p =0.052 and experience χ^2 (2) =5.696, p=0.058), albeit both approached the threshold of statistical significance. In summary, trade deals affect usability, security, speed, and service perceptions, although they have little impact on experience and enjoyment.

09. Table: Kruskal-Wallis Test Statistics by Age

Variable	Kruskal-Wallis H	df	Asymp. Sig.
Usability_mean	11.113	4	0.025
Security_mean	4.746	4	0.314
Speed_mean	5.022	4	0.285
Service_mean	3.436	4	0.488
Satisfaction_mean	3.126	4	0.537
Experience_mean	1.597	4	0.809

A Kruskal-Wallis H test was administered to ascertain whether the variables of usability, security, speed, service, satisfaction, and experience exhibited variance contingent upon the respondents' age demographics. The findings revealed a statistically significant differentiation in usability perceptions among the various age cohorts: χ^2 (4) =11.113, p=0.025. However, no significant statistical abnormalities were seen in security (p=0.314), speed (p=0.285), service (p=0.488), satisfaction (p=0.537), or experience (p=0.809). These results indicate that, unlike other variables, age considerably influences perceptions of usability. Data illustrates that age disparities matter solely in terms of usability, suggesting that service designers might have to tailor specific usability aspects for distinct age groups to enhance the general user experience.

10. Table: Spearman's Rank-Order Correlation Coefficients Between Key Variables

	Usability	Security	Speed	Service	Satisfaction	Experience
Usability	1					
Security	.565**	1				
Speed	.665**	.644**	1			
Service	.648**	.609**	.767**	1		
Satisfaction	.677**	.607**	.685**	.798**	1	
Experience	.579**	.664**	.611**	.637**	.681**	1

Note: **p < 0.01** for all significant correlations (2-tailed). **N = 155** for all correlations.

The relationships between usability, security, speed, service, satisfaction, and experience were investigated using Spearman's rank-order correlation. All examined variables have significant positive associations with the outcomes, as the preceding table shows ($p < 0.01$). Usability was strongly correlated with speed (ρ =.665) and satisfaction (ρ =.677), whereas security was significantly associated with experience (ρ =.664) and Speed (ρ =.644). Additionally, there was a strong association (ρ =.681) between experience and satisfaction, while there was a major association (ρ =.798) between service and satisfaction. With regard to these results, enhancements in one area, like service, may have a beneficial impact on others, especially satisfaction and experience.

Conclusion:

This study exposes the core role of electronic banking services in enhancing customer pleasure. The result shows that usability, efficiency, and service quality are essential variables impacting consumer happiness in electronic banking services. Service quality aspects such as dependability, trustworthiness, and perceived security significantly impact customer loyalty and satisfaction. Studies also suggest upgrading service, especially regarding satisfaction and experience, can yield the most meaningful and beneficial outcomes. Moreover, promoting security and usability could produce a beneficial compounding effect on associated requirements such as speed, user satisfaction, and the overall experience. Technological aspects, including usability, security protocols, and privacy safeguards, are crucial to enhancing customer service, especially in digital banking.

Demographic variables, including age and income, significantly impact customer interactions with electronic banking services, affecting overall satisfaction and loyalty. This research underlines the requirement for safe, user-focused, and trustworthy digital banking services to improve customer satisfaction while cultivating lasting loyalty.

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