

Factor Affecting Customer Satisfaction of Mobile Banking Services of Commercial Bank in Kathmandu Valley

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Abstract:

Mobile banking has achieved a great importance in Nepal's banking sector. Though majority of Nepalese banks have recognized the importance of understanding customer psychology and are highly conscious of it. Some banks often struggle to keep pace with customer expectations. This paper specifically targets commercial bank customers and aims to uncover their differential perceptions. The study aims to identify the most influential factors that affect customer satisfaction and retention in mobile banking and determine their relative impact. The Exploratory research design was adopted as the main research paradigm to discover the reality. The data was evaluated quantitatively by using both descriptive and inferential statistics. Convenience sampling has used data collection and Structural Equation Modeling (SEM) was used to analyze the relationships from 403 responses. The research findings indicated that security, responsiveness, and convenience have a significant impact on customer satisfaction, while cost and relative advantage have a negligible impact. However, although customer satisfaction and loyalty are strongly related, these factors are not directly related to loyalty. This finding holds theoretical relevance for the Service Quality Theory. The scope and depth of this study is limited to banking customers of Kathmandu Valley. Further studies should include other variables to better understand the underlying relationship between customer satisfaction. Implication includes researchers, banking authority and policy makers who focus on enhancing mobile banking services. Mobile banking is an essential aspect that demands greater priority. Significant enhancements must be made to strengthen security measures, ensure stable service and support, and establish a fairly structured cost system to ensure better modern banking and financial systems.

Keywords: customer satisfaction, cost and security, relative advantage, mobile banking services, commercial banks of Nepal

Introduction:

The introduction of information technology in the financial sector has given banking services a new dimension in the 21st century (Jahan et al., 2022). Changes in technological interfaces have made it possible for the financial industry to delight its customers with instant solutions to their problems through the use of self-service technologies (Tam & Oliveira, 2017). Inevitably, the banking sector has transformed to offer prompt and effective customer care through modern technology-based financial services including internet banking, ATMs, and mobile banking. Mobile banking has emerged as a game-changer in the financial industry and it has great impact on the world, particularly in terms of convenience, accessibility, speed, security, cost-effectiveness, financial management tools, eco-friendliness and economic growth (Manjula, 2019). It provides customers with the flexibility to conduct banking transactions anytime and anywhere, leading to increased financial inclusion, particularly for

those in remote areas (Kanungo & Gupta, 2021). Digital channels have reduced costs, and helped in time and money saving of both customers and bank (Son et al., 2020).

Customer satisfaction is the customer's evaluation of a product or service in terms of whether it has met their needs and expectations (Khadka & Maharjan, 2017). The security, reliability, usability and service quality were the most important factors influencing customer satisfaction of mobile banking services (Yang & Lu, 2015). Satisfied customers are more likely to continue mobile banking services and recommend it to others, while dissatisfied customers are more likely to switch to another (Ahmed et al., 2019). Satisfied customers are more likely to have a positive perception which leads to trust the brand, and develop a long-term relationship (Lee et al., 2015). Over the last few years, Nepal has seen a shift toward digital banking, as per Nepal Rastra Bank nine million people utilize m-banking services (Ghimire & Dhakal, 2023). Increased availability of mobile phones, internet penetrations, government initiatives, increased competition among banks, and the convenience of digital banking solutions makes the rise in mobile banking services (Ghimire et al., 2021). Limited connectivity, inadequate infrastructure, security and fraud concerns, evolving regulatory framework, low levels of financial literacy, and poor customer service are some of the key challenges of mobile banking services in Nepal (Klapper & Singer, 2017).

Mobile Banking issues is an eminent concern for financial industry in the 21st Century (George & Kumar, 2013). Mobile banking is a relatively new technology compared to other traditional banking channels. So, people are still hesitant to use them due to concerns about security, unfamiliarity with technology, and privacy concerns (Chipunza, 2008). According to the, Arora et al. (2018), Security and privacy are the main reason to accept new technology, as in the developed and developing countries the system and infrastructure are not enough to provide security and privacy. The study by Bonin et al. (2005), a low education literacy rate, less training in using technology are the hindering factor to adopt the technology. In the current competitive world, banks have to struggle to satisfy its customers through various innovative strategies (Loganathan et al., 2020). As the mobile banking technology is relatively new and the associated issues are evolving rapidly which can be challenging for banking professionals to decipher the issues. There are several issues i.e., fear of hackers, lack of trust, device features, cost and other potentially unexplored issues that can contribute to a negative attitude towards mobile banking. Accurately identifying the critical factors for enhancing the customer experience of mobile banking services is crucial for maintaining customer satisfaction and loyalty, differentiating from competitors, and driving innovation and growth in the market. (Shareef et al., 2018)

Several banks in Nepal offer a variety of online services via ATMs, internet banking, mobile banking, and other digital services, but the public is not yet ready to use them. They hesitate to use them as there might be various reasons behind this problem such as lack of awareness, security issues, lack of trust, and so on (Sherpa, 2015). Thus, understanding the behavior, prioritizing customer psychology and preferences in the development of mobile banking services, Nepalese banks can provide a superior customer experience, increase customer satisfaction and loyalty, and ultimately drive growth in the market. The study aims to identify the general understanding of mobile banking services among customers. The different factors which affect the customer satisfaction, the challenges faced by the customer and at last the managerial solutions to mitigate the challenges.

The remaining part of the study is organized in to four different sections. The next section will show the methodology of the study, where conceptual framework, hypothesis formulation, study area, research instrument will be discussed. Then, the result of the study is

presented through the socio-demographic variable, general perspective of customer the challenges and managerial solutions. At last, the discussion and conclusion are presented.

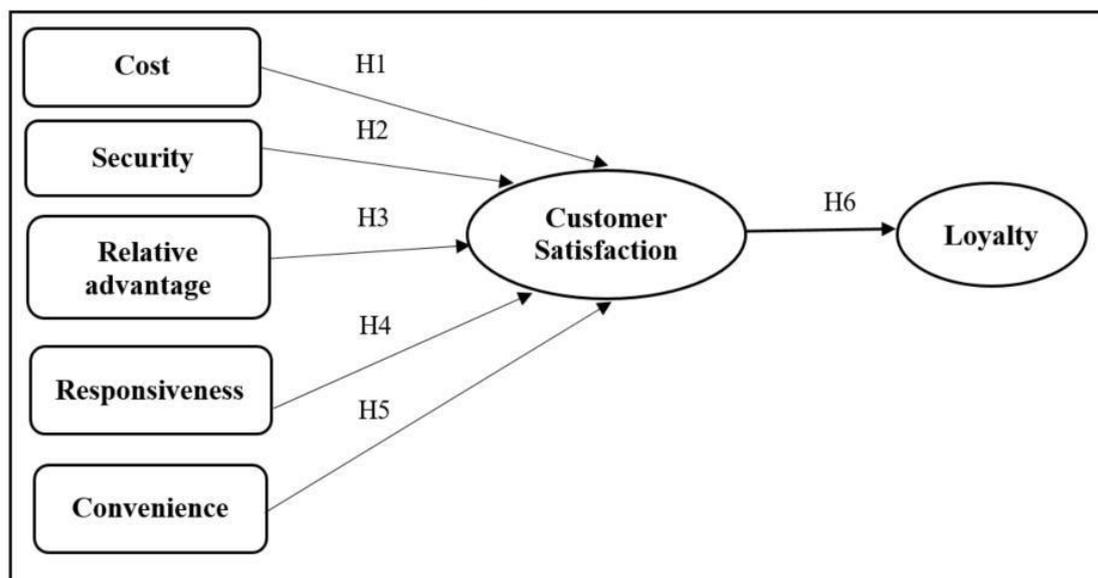
2. Research Methods

2.1 Conceptual Framework and Hypothesis Formulation

The study reviewed several models to know the linkage between different variable and customer satisfaction in mobile banking. One of the models are customer satisfaction and loyalty (Jahan & Shahria, 2021), mobile banking service quality (Amiri et al., 2012), next factor affecting customer satisfaction (Ahmed, 2015). According to John and Shahria (2021) cost, responsiveness and related advantage have the significant impact in satisfaction, while convenience and safety have insignificant relationship. Similarly, conceptual model by Amiri et al. (2012), shows that increase in service quality of mobile banking satisfy the customer and ultimately retains valued customers. Additionally, as per the Ahmed (2015), security and trust is the most influential factor for customer satisfaction where as ineffective advertisement has a negative influence on customer satisfaction.

The study is related with the service quality by Parasuraman et al. (1980). The framework outlines the various factors that contribute to the overall quality of a service, and provides a structured approach to assessing and improving the quality of a service. The model identifies the different dimension of service quality as service quality, such as reliability, responsiveness, assurance, empathy, and tangibles, and provides the guidelines for measuring and improving each of these dimensions. The study by Johan and Shahria (2021), cost, responsiveness, and relative advantage all have a significant impact on satisfaction, whereas convenience and safety have less effect. Although satisfaction and loyalty are strongly linked, they are not directly related to one another.

Figure 1
Conceptual Framework



Source: Adopted from Johan and Shahria (2021)

Cost and Customer Satisfaction: Cost of mobile banking includes transaction fee, bank charge and mobile network charge (Kang, 2017). Cost or expense is an important consideration for people in developing country. A study conducted by Jelcic and Mabic (2019) found that perceived cost of mobile banking services was positively related to customer satisfaction. Additionally, a study by Sarker et al.(2016), found that customers who perceived lower costs in mobile banking services were more likely to use the service and be satisfied

with it.

H1: Cost has a significant relationship with Customer Satisfaction.

Security and Customer Satisfaction: Security is the vital issue to customer for virtual transaction. Ghosh and Barua (2014) defines security as the safety and protection of information. In context of security, not only the information but also the monetary issue is closely related with security due to fraud and hacking (Kabir, 2013). A study by Raza et al. (2017) finds that customers who perceive secure banking transaction are more satisfy with the service. According to Ahanthem (2022), trustworthiness and security of a mobile banking application significantly affects customersatisfaction.

H2: Security has a significant relationship with Customer Satisfaction.

Relative Advantages and Customer Satisfaction: The comparative benefit users get from mobile banking such as social prestige, time-saving, accessibility are the relative advantage. According to a study by baabdullah et al.(2019), the relative advantage of mobile banking services was found to be a significant predictor of customer satisfaction. Similarly, a study by Liu and Liang (2020) found that relative advantage positively affected customer satisfaction and intention to use mobile banking services.

H3: Relative Advantage has a significant relationship with Customer Satisfaction.

Responsiveness and Customer Satisfaction:

Responsiveness is the customer's perception of getting help when needed, immediate response from mobile operator and bank or agent can be an important influencing factor in customer satisfaction. Responsiveness directly engaged with feedbacksession between customers and service providers. According to the study by Daengs et al. (2013), responsiveness is the most crucial attributes and one the significant components for anticipating the customer satisfaction (Iyer et al., 2018)

H4: Responsiveness has a significant relationship with Customer Satisfaction.

Convenience and Customer Satisfaction: Conveyance is the extent to which mobile banking can serve users' needs, it may include ease of use, usefulness etc. (Kabir, 2013). Convenience is a critical factor in determining customer satisfaction with mobile banking services. Customers who perceive mobile banking services as a convenient tool are more likely to be satisfied with the overall service experience (Venter et al.,2019). Additionally, Mobile banking services who offers easy-to-use interfaces, quick transaction processing, and 24/7 availability are more likely to meet customers' convenience expectations and enhance their satisfaction levels.

H5: Convenience has a significant relationship with Customer Satisfaction.

Customer Satisfaction and Loyalty

Customer satisfaction indicates positive feelings of a consumer after consuming the product or services (Kheng et al., 2010). The customer satisfaction is treated as the necessary premise for the retention of customers. According to Lam and Burton (2006), identified satisfaction as the main determinants of loyalty. Loyalty is the degree to which a customer exhibit repeating purchasing behavior from the vendor (Kotler et al., 1999). A satisfied customeris more likely to stay loyal to their mobile banking provider, resulting in a lower likelihood of switching to a competitor Hajli (2015).

H6: Customer Satisfaction has a significant relationship with loyalty.

Table 1
Variables and its Definition

Construct	Items Notation	Explanation
Cost	CST_1	Cost of using mobile banking service is reasonable.
	CST_2	I am satisfied with the transaction fees and charges associated with mobile banking services.
	CST_3	I am satisfied with the cost of using mobile banking services compared to other banks.
	CST_4*	Low fees and charges are important for me to use mobile banking services.
	CST_5*	I am satisfied with the value for money offered by mobile banking services.
	CST_6*	I am willing to pay a higher fee for additional features or benefits associated with mobile banking services.
Security	SEC_1	I feel secure in using mobile banking services.
	SEC_2*	I have experienced security issues while using mobile banking services.
	SEC_3	I trust mobile banking service providers to keep my personal information safe.
	SEC_4	I am satisfied with the security measures implemented by mobile banking service providers
	SEC_5	I find it easy to use the security features provided by mobile banking providers, such as two-factor authentication.
	SEC_6*	I frequently change my mobile banking passwords or PINs.
Relative Advantage	REL_1*	It is easier to conduct transactions in mobile banking services compared to other banks.
	REL_2*	It saves my time using mobile banking services than visiting a physical bank branch.
	REL_3	It makes efficient to manage my finance using mobile banking services.
	REL_4*	I find innovative features in mobile banking services.
	REL_5	Mobile banking services is more accessible compared to traditional banking services.
	REL_6	Mobile banking services is more flexible in terms of the range of transactions.
Responsiveness	RES_1	I can easily contact customer service representatives when I have a problem with my mobile banking account.
	RES_2	Mobile banking service providers are always willing to help.
	RES_3	M-banking customer care provides prompt and accurate services.
	RES_4*	M-banking customer care takes more time (more than your expectation) to respond to your request.
	RES_5*	Mobile banking service provider informs me of any changes or updates to their services in a timely manner.

	RES_6*	Mobile banking service providers follow up to ensure my issue has been resolved to my satisfaction.
Convenience	CON_1	It is easy to use mobile banking services.
	CON_2	It is easy to navigate account information using mobile banking services.
	CON_3	I can quickly and easily complete a transaction using mobile banking services.
	CON_4*	It is very convenient to use mobile banking services compared to visiting a physical bank branch.
	CON_5*	It is convenient to transfer funds, between accounts using mobile banking services.
	CON_6*	It is convenient to access mobile banking services at anytime of the day.
Customer Satisfaction	CUS_1	I am satisfied with the mobile banking services provided by the bank.
	CUS_2	I am satisfied with the range of services offered through mobile banking.
	CUS_3	I am satisfied with the customer service provided by the mobile banking service provider.
	CUS_4*	I am satisfied with the level of personalization offered by mobile banking services.
	CUS_5*	I am satisfied with the reliability of mobile banking services.
	CUS_6*	I am satisfied with the accuracy of the account information provided by mobile banking services.
Loyalty	LOY_1	I am willing to continue using mobile banking services in the future.
	LOY_2*	I would recommend mobile banking services to others.
	LOY_3*	I would pay a premium fee for mobile banking services if they were offered.
	LOY_4	I am willing to switch to another bank that offers better mobile banking services.
	LOY_5	I am only loyal to bank because of the mobile banking services provided.
	LOY_6	Mobile banking services is crucial factor in determining whether I will continue doing business with my bank or

NOTE: * Variable are excluded while data analysis through Structural Equation Modeling (SEM) which is shown in above table-1.

Research Design

This research is based on an explanatory research design. The explanatory design of research is used for testing causal theory in many scientific arenas, particularly in the field of social sciences (Shmueli, 2010). The study aims to analyze the factors affecting customer satisfaction of mobile banking services, explanatory research design would be appropriate to investigate the causal relationships (Ennew et al., 1999), between different factors (Cost, security, responsiveness, relative advantage, Convenience) and customer satisfaction.

Study Area and Population

The study area for this research is the Kathmandu Valley, which includes the three cities of Kathmandu, Lalitpur, and Bhaktapur. The geographic coordinates of Kathmandu valley are: latitudes 27°32'13" and 27°49'10" north and longitudes 85°11'31" and 85°31'38" east and

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is located at a mean elevation of about 1,300 meters (4,265) above sea level in the bowl-shaped and thus Kathmandu valley covers an area of 395 km² (Paudel et al., 2020). The valley has significant infrastructure development, making it an ideal location for researching mobile banking services. According to the NTA's (2021) report, Kathmandu Valley has a high level of mobile and internet penetration, with a significant proportion of the population using digital technology for various online activities. Mobile banking services are being used by a wide range of individuals, entrepreneurs, and organizations, including business owners who use QR scanners for quick payment processing. Business owners are using mobile banking services to manage their finances, pay bills, and receive payments from customers, while students are using them to manage their finances and pay tuition fees. The increasing use of mobile banking services in the Kathmandu valley provides a large sample size for conducting research and provides valuable insight into customer satisfaction. For the study, data will be collected from general people in the Kathmandu Valley who uses mobile banking services and e-commerce platform for their transactions.

Research Instrument, Data Collection, and Analysis

A research instrument is a tool or method used to collect data or information in a research study, interviews, observations and surveys are one of the types (Shrestha et al., 2021). Structure questionnaire is emerged for collecting the primary data. It has uses the 5 Likert scale for the construct, where (1= strongly disagree) and (5 = strongly Agree). To measure the customer satisfaction and loyalty 6 construct is used i.e. Cost (6 items), security (6 items), responsiveness (6 items), relative advantage (6 items), Convenience (6 items), customer satisfaction (6 items), customer loyalty (6 items). A structural questionnaire is prepared to collect data from 403 respondents. KOBO tool box is used to collect the data and pilot testing is done from 15 samples. Data is analyzed from descriptive and inferential methods, which uses structural equation modeling (SEM). Different software used for analysis such as, Microsoft Excel, SPSS (version 21) and SPSS AMOS (version 22) were used to analyze inferential data.

Sampling Techniques and Determination of Sample Size

The study has used the non-probability sampling as the respondents are undefined. Convenience sampling is used in the study as respondents are selected based on their availability and accessibility, rather than being selected randomly from a larger population (Bryman, 2016). Sample size is determining through the different method, the equation for calculating the sample size, given as: $n_0 = \frac{Z^2 pq}{e^2}$, where n_0 = sample size for study, Standard tabulated value for 5% level of significance (z) = 1.96, Prevalence or proportion of an event 50% = 0.50, $p= 0.5$, $q = 1-P$, = 0.5, Allowable error that can be tolerated (e) = 5%. This study also undertakes 5% non-response error. Thus, sample size taken for study was 403.

Results:

Socio-Demographic Analysis

The study has used the 403 respondent, majority of the respondents are male (62%) followed by female (38%), the result shows the higher portion of male customer in using mobile banking. It reveals that the most of the respondents are from age group (35-45) represented by 42%, followed by age group (25-35), which is 30% and other are least involve.

Additionally, the education background of the respondents is bachelor level and represent by 36.97% respondents, 34% customers have master degree, and other are least involve in the

survey they are from +2/ High School, SEE and Below SEE level represented by 17.87%, 8.69% and 12.41%. Further, majority of the respondents are engage in business (34.99%), 25.06% are involve in private job, 11.91% involve in government job and least people involve in other sector. Majority of the respondents (34.20%) have the income level 50000 to 1 lakh, and 24.305 of the respondents are related to the income level of 25000-50000, while least 7.8% of the respondents have below 25000 income level.

Table 2
Socio-Demographic Variable

Title	Category	Number	Percentage (%)
Gender	Male	251	62%
	Female	152	38%
Age	15-25	41	10%
	25-35	119	30%
	35-45	168	42%
	45 and above	75	19%
Education Level	Below SEE	50	12.41%
	SEE/SLC	35	8.69%
	+2/High School	72	17.87%
	Bachelor	149	36.97%
	Master and above	97	24.07%
Occupation	Government Job	48	11.91%
	Private Job	101	25.06%
	Business	141	34.99%
	Farmer	5	1.24%
	Student	54	13.40%
	Service	17	4.22%
	NGOs/INGOs	5	1.24%
	Others	32	7.94%
Income Level	Below 25000	31	7.8%
	25000 to 50000	98	24.30%
	50000 to 1 lakh	138	34.20%
	Above 1 lakh	67	16.60%
	Dependent upon family	69	17.10%

Source: Field Study

General Understanding of Mobile Banking Services

The study reveals that 100% of the respondents have used mobile banking services, majority of the respondents have used the mobile banking services through the 3-5 years, while 20.35% already used the mobile banking services from (1-2) years. 17.12% have used the mobile banking services from 5 years. The result show that majority of the respondents use the services through daily basis (26.30%), and other as weekly basis. The major purpose of using the service is transferring the fund (71.96%), Mobile topup (70.47%), QR Code Payment (68.98%), Fonepay load E-sewa (64.76%) etc. They reveal that easiness using the mobile banking services (39.45%), moderate level (33.00%) and respondent feel that it is important to have the availability of mobile banking services (38.21%).

Table 3
General Understanding of Mobile Banking Services

Title	Category	Number	Percentage (%)
Ever used Mobile banking services	Yes	403	100%
	No	0	0%
How long have you been using mobile banking services	Less than a year	27	6.7%
	1-2 years	82	20.35%
	3-5 years	225	55.83%
	Above 5 years	69	17.12%
How often do you use mobile banking services	Daily	111	27.54%
	Few days in a week	90	22.33%
	Weekly	106	26.30%
	Few days in a month	81	20.09%
	Monthly	14	3.47%
	Few times in a year	1	0.25%
What type of mobile banking services do you use	Account Balance Enquiry	234	58.06%
	Fund Transfers	290	71.96%
	QR Code Payment	278	68.98%
	Mobile Topup /Recharge Cards	284	70.47%
	Fonepay, Load eSewa & Khalti Wallets	261	64.76%
	Mini/Full Statement Request	122	30.27%
	Bill Payments	105	26.05%
	Others	26	6.45%
How easy does it makes for you to conduct transactions through mobile banking	Extremely easy	66	16.38%
	Easy	159	39.45%
	Moderate	133	33.00%
	Less easy	43	10.67%
	Very less easy	2	0.50%
How important is it for you to have a availability of mobile banking services	Very important	121	30.02%
	Important	154	38.21%
	Neutral	77	19.11%
	Not important	41	10.17%
	Not at all important	10	2.48%

Challenges in Adoption & Usage of Mobile Banking Services

The study reveals that 100% respondents feel there is a challenge in adoption of mobile banking services. The major challenges shown by survey are High-cost usage of mobile banking services (73.20%), Lack of security, and privacy measures of mobile banking services (70.97%), Lack of Customer support for resolving technical problems (67.74%),

System error/Server down of mobile banking services (42.18%), Lack of trust in mobile banking services and their providers (39.21%), Limited access to reliable internet connectivity, technology, and infrastructure (30.02%), Slow speed in doing transactions (15.63%), Difficulty in navigating complex mobile banking service platforms (14.64%), Compatibility issues with mobile devices or operating systems(14.14%), Lack of awareness and knowledge about mobile banking services tools (13.4%). A similar study by Dodoo et al. (2020) finds that lack of trust in digital banking providers, lackof reliable internet connectivity, technology, and infrastructure, high-cost usage, and lack of security and privacy measures were some of the top challenges in adoption & usage of mobile banking services. A study by Ghelani et al. (2022) shows that technical issues such as server downtime are a significant cause of customer dissatisfaction with digital banking services.

Table 4
Challenges in Adoption & Usage of Mobile Banking Services

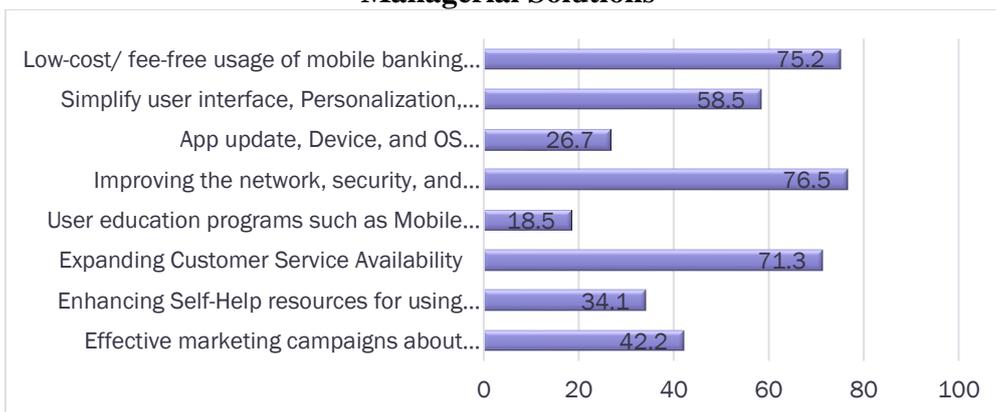
Challenges	Number of Respondents	Percentage
High-cost usage of mobile banking services.	295	73.20%
Lack of security, and privacy measures of mobilebanking services.	286	70.97%
Lack of Customer support for resolving technical problems.	273	67.74%
Server down of mobile banking services	170	42.18%
Lack of trust in mobile banking services and their providers.	158	39.21%
Limited access to reliable internet connectivity, technology, and infrastructure.	121	30.02%
Slow speed in doing transactions.	63	15.63%
Difficulty in navigating complex mobile bankingservice platforms.	59	14.64%
Compatibility issues with mobile devices oroperating systems.	57	14.14%
Lack of awareness and knowledge about mobilebanking services tools.	54	13.4%

Managerial Solutions

Respondents are asked about the management strategies for the effective implementation of mobilebanking practices. Low-cost/fee-free usage of mobile banking services (75.2%), improving the network, security, and privacy measures of mobile banking services (76.5%), expanding customer service availability (71.3%), simplify user interface, personalization, and enhance user support for easy use (58.5%) are highly recommended.

Other respondents feel that effective marketing campaigns about mobile banking services tools (42.2%), enhancing self-help resources for using mobile banking services (34.1%), app update, device, and OS recommendationsfor compatibility (26.7%), and user education programs such as mobile app tutorials, hands-on training, and feedback mechanisms (18.5%) are strategies that help to enhancecustomer satisfaction of mobile banking services.

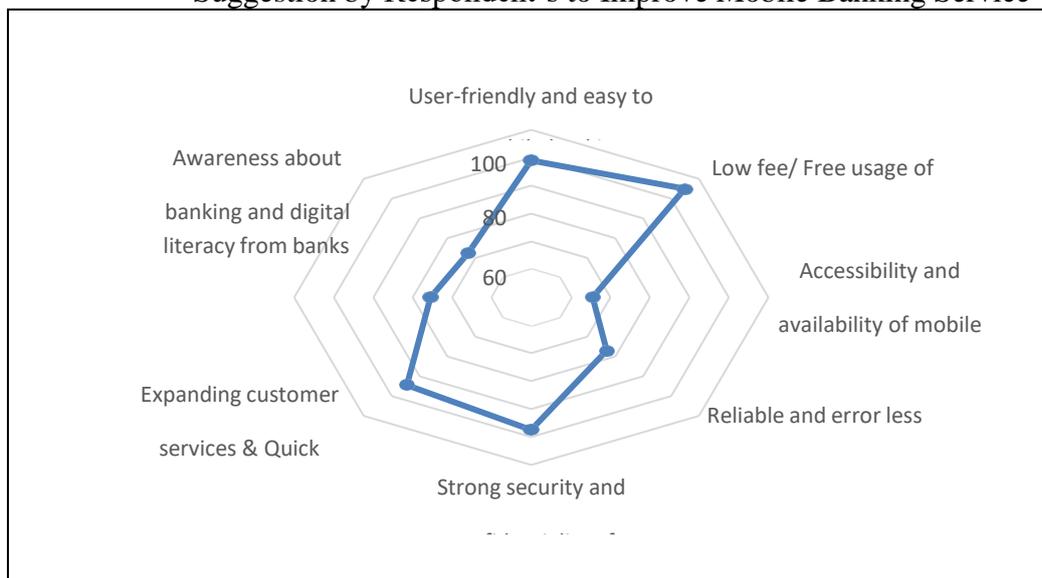
Figure 2
Managerial Solutions



Source: Field Survey (2023)

The finding reveals that the authorities such as bank/financial institutions (73.95%), employees (69.93%), technological companies (36.7%), government (21.73%), and customers (10.49%) have eminent role in the successful execution of mobile banking services.

Figure 3
Suggestion by Respondent's to Improve Mobile Banking Service



Source: Field Survey (2023)

The respondents feel that mobile banking services could be improved by making them low fee/ Free usage of mobile banking services (110), user-friendly and affordable (98), Strong security and confidentiality of customer information(95), Expanding customer services & Quick resolution of customer problems and errors (89), Reliable and error less transactions (54), Rewards and loyalty programs for frequent user of mobile banking services (51), Accessibility and availability of mobile banking services nationwide (31), and Awareness about banking and digital literacy from banks (45).

Inferential Analysis:

Confirmatory factor analysis (CFA)

CFA is a technique to verify the observed variables, it used to simultaneously test multiple hypothesis (Suhr, 2000). It examines if a collection of components has the expected effect on answers. The fitness indicators CMN /DF is 3.407, RMR is 0.042, RMSEA is 0.077, GFI is 0.863, IFI is 0.933, TLI is 0.919 and CFI is 0.933 are used to assess if the model fit is great or not. From the result it demonstrate the model is fit in this study is excellent, since all the indicator meet the criteria, which are CMN/DF < 3, IFT>0.90, TLI>0.90, and CFI>0.90 requirement for good fitting(Suhr, 2000).

Convergent Validity (CV)

The degree to which distinct measurements of the same construct converge or significantly correlate with one another is referred to as convergent validity (Rönkkö & Cho, 2022). It has to do with how much a set of scale items is supposed to reflect a build depending on a set of facts about that construct. Three estimations are usually used to check the convergent validity of each variable (Benitez et al., 2020): Factor loading, Average Variance Extracted (AVE), and Construct Reliability (Ting, 2018) also proposed using the minimum cutoff criteria to determine convergent validity: where the average variance explained (AVE) must exceed 0.50, construct reliability (CR) should be above 0.70, and CR should be higher than AVE.

Discriminant Validity (DV)

The degree to which the measurement of various conceptions diverges or barely correlate with one another is referred to as discriminant validity. It guarantees that a structural measure is empirically distinct and describes phenomena of interest that are missed by other indicators in a structural equation model. It's argued that a measure has discriminant validity when it doesn't correlate with other measures that aren't conceptually similar. In order to determine convergent validity, it has two scenarios: AVE should be greater than ASV and MSV, and \sqrt{AVE} should be greater than correlation (r).

Measurement Model

Measurement model is used to assess the construct validity of each variable, both convergent and discriminant validity was used. Measurement model was projected by using AMOS software and the data's validity was determined with the use of James Gaskin's stat wiki validity matrix.

Table 5
Measurement Model

	CR	AVE	MSV	Max R(H)	CUS	CST	SEC	REL	RES	CO N	LO Y
CUS	0.912	0.776	0.116	0.930	0.881						
CST	0.872	0.695	0.087	0.876	0.139	0.833					
SEC	0.936	0.784	0.124	0.948	0.341	0.163	0.886				
REL	0.893	0.736	0.119	0.908	0.143	0.193	0.272	0.858			
RES	0.941	0.843	0.087	0.986	0.281	0.295	0.281	0.037	0.918		

CON	0.927	0.809	0.124	0.938	0.314	0.207	0.352	0.345	0.238	0.899	
LOY	0.898	0.688	0.042	0.911	0.169	0.205	0.043	0.123	0.198	0.181	0.830

Source: Field Study (2023)

The summary of the values of the variables are presented in table-5. For validity concern data must meet the condition of $CR > 0.70$ and $AVE > 0.50$ for convergence validity, and $AVE > MSE$ and square root of $AVE >$ correlation to indicate discriminant validity. In the study the mentioned criteria are fulfilled for both convergence and discriminant validity.

Mediation Analysis

The research uses the mediation analysis to test whether there is significant impact in independent and dependent variable. To test the result Hayes Process Macro. The mediation analysis shows that direct and indirect effect on model. In this study five mediation analysis has investigated such as $CST \rightarrow CUS \rightarrow LOY$, $SEC \rightarrow CUS \rightarrow LOY$, $REL \rightarrow CUS \rightarrow LOY$, $RES \rightarrow CUS \rightarrow LOY$, $CON \rightarrow CUS \rightarrow LOY$. The direct effect is (c'), indirect effect ($a*b$). Direct effect is measure through the criteria of p-value which is ($p \leq 0.05$; $p \leq 0.01$; $p \leq 0.001$). The indirect effect is measure through the criteria of lower and upper value of Bootstrap. In the study, the result show that $CST \rightarrow CUS \rightarrow LOY$, $RES \rightarrow CUS \rightarrow LOY$, $CON \rightarrow CUS \rightarrow LOY$ has meet the criteria of both direct and indirect effect which shows that there is a partial mediation between these variables. Where as $SEC \rightarrow CUS \rightarrow LOY$ and $REL \rightarrow CUS \rightarrow LOY$, shows the significant result of indirect effect (i.e. Full Mediation).

Table 6
Mediation Analysis

Hypothesis	Direct Effect	Indirect Effect		
	Effect (C')	Effect (a*b)	BootLLCI	BootULCI
$CST \rightarrow CUS \rightarrow LOY$	(0.17)**	0.0326	0.0083	0.0681
$SEC \rightarrow CUS \rightarrow LOY$	(-0.0211)	0.0788	0.0340	0.1341
$REL \rightarrow CUS \rightarrow LOY$	(0.0890)	0.0657	0.0212	0.1225
$RES \rightarrow CUS \rightarrow LOY$	(0.1574)**	0.0365	0.0110	0.0709
$CON \rightarrow CUS \rightarrow LOY$	(0.1208)*	0.0433	0.0139	0.0814

Note: * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

Test of Hypothesis

The study has six hypotheses H1 to H6. The hypothesis H2, H4, H5, H6 have significant relationship where as Hypothesis H1 and H3 shows the insignificant relationship. Mediation analysis uses to evaluate the relationship between the independent and dependent variable, to test this Hayes Process Macro is used. This test is used to check the relationship of mediating variable “customer satisfaction” with the independent variable (Cost, Security, Relative Advantage, Responsiveness, Convenience), and the dependent variable (customer loyalty).

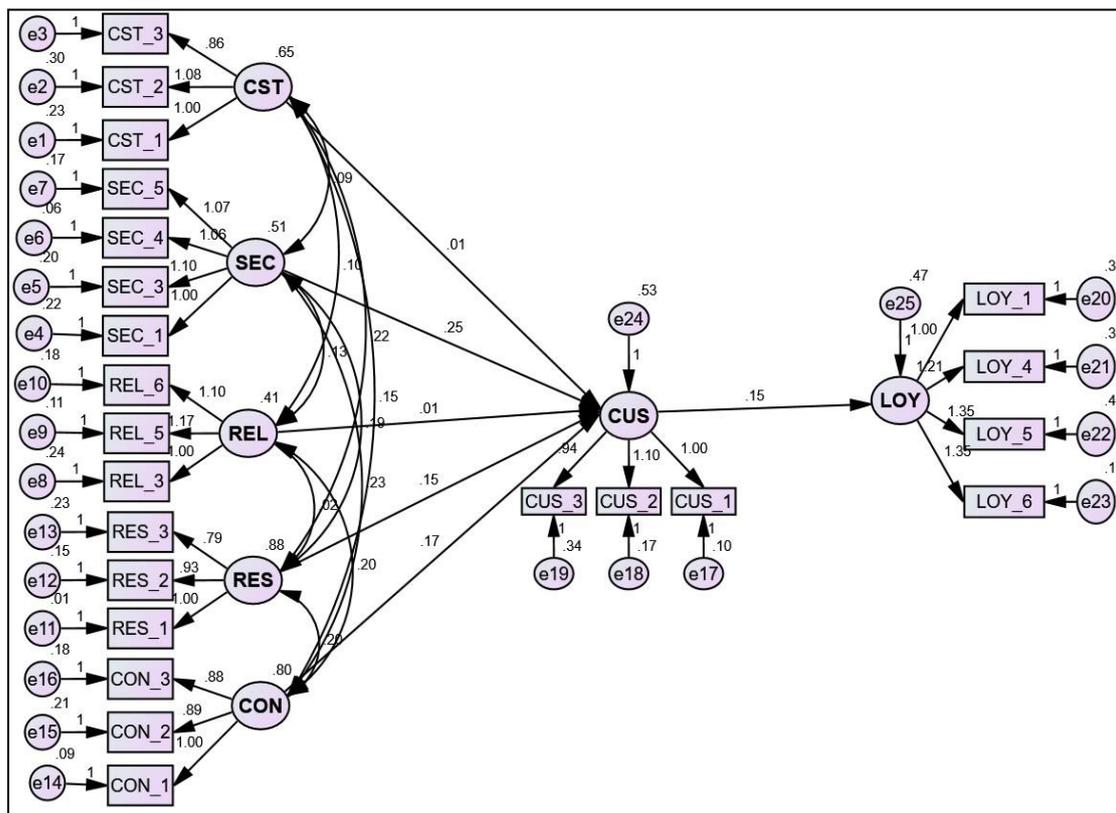
In this inferential phase regression analysis, variable analysis and assessment of the normalcy pattern are analyzed using SEM. Latent variable and observed variable are assess. The model

fitness standard shows the good shape. The result of CMIN/DF is $3.355 < 5$ which can be accepted. The p value is less than 0.05 which shows the meaningful association between latent variable and observed variable. For accepting the hypothesis p-value need to be less than 0.05 i.e. (< 0.05).

Table 7
Test of Hypothesis

			Estimate	S.E.	C.R.	P	Conclusion
CST	→	CUS	.013	.055	.243	.808	Rejected
SEC	→	CUS	.249	.062	4.007	***	Accepted
REL	→	CUS	.012	.070	.168	.867	Rejected
RES	→	CUS	.147	.045	3.243	.001	Accepted
CON	→	CUS	.173	.051	3.416	***	Accepted
CUS	→	LOY	.150	.047	3.211	.001	Accepted

Figure 4: Structural Model



Source: Field Study

Discussion:

The adoption of mobile banking services is becoming increasingly important for banks to remain competitive and meet customer expectations in the digital age (Zouari & Abdelhedi, 2020). Mobile banking services have the potential to transform the way people access and manage their finances globally by providing banking opportunities (Christopher, 2015). The study tries to measure the factor affecting customer satisfaction in mobile banking. The study has 6 hypotheses measure the customer loyalty. Hypothesis H1 is related with the cost, as the cost of using the transaction have influence in customer satisfaction (Jelcic & Mabic, 2019). H2 is related with security, as the safety and protection of information influence the

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satisfaction level of the customer (Ghosh & Barua, 2014). Hypothesis H3 emphasizes about the Relative Advantage, the benefits the users gets from mobile banking such as social prestige, time-saving, accessibility are the relative advantage (baabdullah et al., 2019). Additionally, Hypothesis H4 is related with responsiveness, as feedback session between customers and service providers anticipate the customer satisfaction (Iyer et al., 2018; Daengs et al., 2013).

The study shows that cost and relative advantage did not significantly affect customer satisfaction, implying that mobile banking service providers should focus on improving other factors. Security, responsiveness, and convenience were found to have a significant positive impact on customer satisfaction, indicating that providers should prioritize these aspects when designing and delivering mobile banking services. The similar study by Nguyen and Nguyen (2021) found that security and convenience are factor affecting customer satisfaction. Similarly, a study by Jyoti and Sharma (2020) in India found that security, reliability, and responsiveness are the key drivers of customer satisfaction of mobile banking services. Banks and mobile service providers should focus on improving factors such as security, responsiveness, and convenience rather than solely competing on relative advantage and price to increase customer satisfaction and loyalty. Furthermore, different theories are discussed and service quality model is appropriate in this study by Parasuraman et al. (1980), that discloses that there are various factors which contribute to the overall quality of a service, and provides a structured approach to assessing and improving the quality of a service.

Conclusion

The widespread adoption and continuous development of mobile banking within the financial industry have profound and long-lasting impacts in the digital era (Shaikh, 2018). The study tries to explore the factors affecting banking customer satisfaction and loyalty. In addition, the study tries to show the challenges and managerial solutions in adoption of mobile banking services. The study reveals that security, responsiveness and convenience feature of the mobile banking services make the customer satisfy in using mobile banking services. Similar type of result is revealed by the Oh and Kim (2022), which shows that the security is the most influential factor for customer rating in mobile banking services. While cost and relative advantage play a insignificant relationship with customer satisfaction and loyalty. Mobile banking provides them with a convenient way to access their financial information and conduct transactions on the go, without the need to physically visit a bank branch. There are lots of challenges in adaptation of mobile banking services such as high cost of uses of mobile banking services, lack of security, and privacy measures, lack of customer support, server down problem, lack of trust etc. Respondent demonstrate that the for effective implementation of mobile banking practices bank need to reduce the transaction cost, improve in network, security and privacy measures. The interface needs to be user friendly and easy to use and need to expand customer service availability. Similarly, this study will provide valuable insights for policy makers and governments in developing strategies for promoting the adoption of mobile banking services among the general public. It will also help financial institutions and mobile network operators to better understand the factors that influence customers' adoption and usage of these services. Moreover, this study can assist managers and organizations in determining the potential benefits and challenges of implementing mobile banking services, and in designing effective marketing campaigns to promote these services to their customers. At last, this study is based in commercial bank mobile banking customer satisfaction. For further research other BFIS respondents can be used.

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