



A Model to Analyze the Mobile e-banking Application Quality Factors impact on Consumers' e-Loyalty: Mediating Role of e-Satisfaction

Atif Ali Gill¹, Muhammad Hasnain Ali², Maria Aslam³, Muhammad Hasnain Amjad⁴

¹ Faculty Department of Business Administration, University of Sahiwal, Pakistan. Email: atifali@uosahiwal.edu.pk

² Faculty Department of Business Administration, University of Sahiwal, Pakistan.

³ Lecturer Government College University Faisalabad (Sahiwal Campus), Pakistan.

⁴ Research Scholar Department of Business Administration, University of Sahiwal, Pakistan.

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ABSTRACT

Technology has transformed the banking industry. The banking sector has adopted digital ways to provide the best service to consumers to increase loyalty. The current study examines the influence of e-banking mobile application quality factors comprising reliability, application design, and trust on consumers' e-loyalty in Pakistan's private banking sector. Furthermore, the mediating role of e-satisfaction examined between the relationship of e-banking mobile application's quality factors and consumers' e-loyalty. The data were collected through 218 consumers of private banks in Pakistan using convenience sampling. The questionnaire was adopted through literature. The statistical tool Smart PLS 3.2.8 has been utilized to do partial least square structural equation modeling (PLS-SEM). The reliability and trust have significantly influenced e-loyalty in findings, while mobile application design reveals an insignificant effect on e-loyalty. The study contributed to the existing literature on e-banking by using cognitive-motivational-relational theory through mediating role of e-satisfaction. The present research anticipated offering guidelines to improve customer satisfaction and consumer loyalty in developing countries' private banking sectors.



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Corresponding Author's Email: atifali@uosahiwal.edu.pk

1. Introduction

The banking system is an essential part of modern economics. It plays a vital role in capital formation and a country's growth. E-Banking system allows customers to access their accounts anytime and from any location. Banks invest heavily in modern technology to attract clients and implement the most current e-banking strategies to increase their market advantage. Due to increasing competition day by day in the banking sector, it has become essential to satisfy customers' needs by providing high-quality service (Anouze & Alamro, 2019). Online users demand a high level of reliable and trustworthy digital banking applications than traditional users. Enhancing customer confidence is the best strategy to keep them loyal to e-banking (Ramesh, Jaunky, Roopchund, & Oodit, 2020). Significantly during COVID-19, the pressure on electronic banking (e-banking) has risen tremendously.

Traditional face-to-face banking was on the low side during pandemics, which led to an increase in e-banking platforms. Pakistan is the fifth most populous country in the world (Nationsonline.org, 2021). The effect of the pandemic also hit Pakistan severely. The banking sector was among few industries which remained in operation during pandemics following strict standard operating procedures. However, the traditional banking and visit personally to the branches were on the lowest verge. The digital banking boost and many

new online consumers registered themselves to use e-banking services. Consumers and clients use mobile applications frequently to utilize e-banking services (Sandhu & Arora, 2020). Mobile users are curious about the reliability of mobile banking applications because nowadays the cyber-crimes are widespread, and unreliable banking applications cause severe damage to customer loyalty towards that bank.

In the same way, trust plays a crucial role while using a mobile application; the lack of confidence arises the dissatisfaction among consumers. At the same time, mobile application design should be user-friendly to attract more clients. Satisfied customers are often more loyal to the banking services. Unfortunately, developing countries like Pakistan face a lack of infrastructure issues that create mistrust among consumers and are often unable to provide the required effective services to clients (M. Kumar & Gupta, 2020).

In addition, the banking consumer is more sensitive towards the reliability of banking applications because they involve financial matters (Chien et al., 2021). Therefore, that application that has security breaches can cause substantial economic loss to the clients and damage the reputation of a particular bank. Thus, the banks are very conscious of the quality factors of mobile e-banking applications.

The above literature proposed the following research questions:

Do quality factors (reliability, design, and trust) of mobile e-banking application influence the consumers' e-loyalty?

Does e-satisfaction mediate the relations between mobile e-banking application quality factors (reliability, design, and trust) and consumers' e-loyalty?

2. Literature review

2.1. Mobile E-banking Application quality factors and e-Satisfaction

Previous authors have measured the e-banking quality through reliability, design layout, security, privacy, and trust. While reliability, application design, and trust emerged as leading factors influencing customer satisfaction in the e-banking context (Shankar & Jebarajakirthy, 2019). Reliability appears in most research that demonstrates the customer's belief that the e-banking application has error-free execution and performs its functions as required by the consumer. E-banking involves financial transaction and customer is very much conscious while doing financial transactions through mobile e-banking application. In case of any error, the customer may be reluctant to use other times, leading to a dissatisfied consumer (J. Kumar, Gupta, Rashid, & Shyam, 2020; Shair et al., 2021). The mobile application design is demonstrated as another vital factor of mobile e-banking application quality. It must be user-friendly and easy to navigate. The majority of organizations use digital banking systems to make transactions. It's because of its trust, due to that in greater satisfaction to e-banking.

The following hypotheses derived as follows:

H1: The reliability quality factor of mobile e-banking application positively influences the e-satisfaction of consumers' e-loyalty.

H2: The design quality factor of mobile e-banking application positively influences the e-satisfaction of consumers' e-loyalty.

H3: The trust quality factor of mobile e-banking application positively influences the e-satisfaction of consumers' e-loyalty.

2.2. E-Satisfaction and e-Loyalty

Customer satisfaction is the ability to evaluate the customer's needs and expectations. E-satisfaction, also known as service quality satisfaction, evaluates customers' needs and expectations to determine how banking services can help them achieve their goals (Haq & Awan, 2020). Satisfied customers are more likely to utilize e-banking services regularly for a long-term period. They are also more inclined to

recommend e-banking applications to others than those who aren't satisfied. Customer loyalty is the ability to repurchase by satisfied clients. Moreover, consumer loyalty can be defined as "a deep-rooted assurance to rebuy/patronize a preferred product/service in the future." E-loyalty in banking refers to the shift from traditional loyalty to digital loyalty towards banking applications in the modern age. Previous literature witnessed the relationship between e-satisfaction and e-loyalty and shed light to further examine in an emerging economy (Kaya, Behraves, Abubakar, Kaya, & Orús, 2019; Pham, Williamson, & Berry, 2018; Rodrigues, Almeida, Figueiredo, & Lopes, 2019).

The following hypothesis has been derived from the literature mentioned above:

H4: E-satisfaction in mobile e-banking application positively influence the consumers' e-loyalty.

2.3. Mediating role of e-Satisfaction

Businesses are constantly striving to improve customer satisfaction. Customers' happiness depends on the quality of the services they receive through their banks and the level of satisfaction (Quan, Chi, Nhung, Ngan, & Phong, 2020). The role of e-satisfaction in a customer's commitment is reflecting in E-banking services quality. E-satisfaction affects the consumer fulfillment response and stimuli the behavior and plays a role as an intervening variable between e-loyalty and its antecedents (Kaya et al., 2019; Teimouri & Goodarzvand Chegini, 2018; Vijay, Prashar, & Sahay, 2019).

The literature cited above leads towards the following hypotheses:

H5: The reliability quality factor of mobile e-banking application indirectly affects consumers' e-loyalty via e- satisfaction.

H6: The design quality factor of mobile e-banking application indirectly affects consumers' e-loyalty via e- satisfaction.

H7: The trust quality factor of mobile e-banking application indirectly affects consumers' e-loyalty via e- satisfaction.

2.4. Cognitive, motivational relational (CMR) theory

The process of analyzing different views and expressions of human behaviors is particularized by CMR theory. Emotions encourage almost all of the critical events in our lives. It also helps us to respond to these encouragements (Alam, 2019). CMR theory can be used in multiple cases to link the mechanisms of individual response and quality services. For example, customer loyalty in e-banking is an additional theoretical aspect (Campanella, Del Giudice, Thrassou, & Vrontis, 2020). CMR explains the relationship between customer loyalty and e-banking quality dimensions and suggests a link between behavioral outcomes and mental evaluation. The researcher also identified customer loyalty as an emotional stimulus that influences their behavior (Lin & Shiqian, 2018). As shown in Figure 1, the following theoretical framework is based on CMR theory. Mobile e-banking quality factors are reflected as reliability, design, and trust stated as independent variables, e-satisfaction as mediator variable, and e-loyalty the dependent variable.

3. Methodology

3.1. Data Collection

The population of the current study is consumers of e-banking of five central private scheduled banks in Pakistan. Although the exhaustive list of e-banking consumers was not available, the researcher used convenience sampling to get responses (Ghali, 2021). The optimal sample size 129 calculated through Gpower stated by (Abt et al., 2020) at medium effect size 0.15 while considering the low response rate from the developing country mentioned by (Gill, Ahmad, & Kazmi, 2021) total of 400 questionnaires were distributed through the survey method, while only 230 responses were received. At the same time, 12 replies were partially filled, so they were excluded from the reaction. The remaining 218 responses were further considered for statistical analysis. The questionnaire was adopted through literature (attached in Appendix) having a five-point Likert scale.

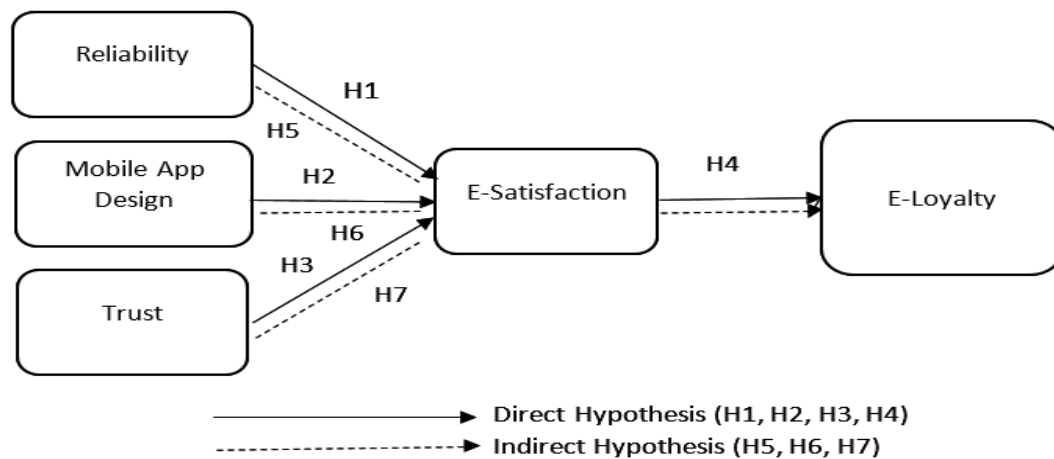


Figure 1: Research Model

3.2. Statistical tool

A partial least square method was used to analyze the data collected through the survey. In addition, structural equation modeling techniques using software Smart PLS 3.2.8 were utilized. The data were analyzed in two steps. In the first step, the PLS Algorithm (Hair, Hollingsworth, Randolph, & Chong, 2017) is used to examine the reliability and validity of items. In the second step, Bootstrap was used to check the significance of direct and indirect hypotheses.

4. Analysis Results

4.1. Demographic Profile

The respondent profile depicted that most respondents were male, showing 66%, while their highest education level was 49.6%. It shows that mobile application users of digital banking are primarily male in Pakistan and have a high literacy rate. The age bracket shows that the majority are between 31-40 frame shows the maturity of respondents. While their experience of using mobile e-banking applications is 3-4 years, which means they are using the application for a few years. Most respondents belong to Habib bank limited due to the high level of branches and an extensive database of online consumers.

Table 1
Respondents' profile

Demographic variables	Frequency	Percentage
Gender		
Male	144	66%
Female	74	34%
Education		
Intermediate	8	3.7%
Graduation	108	49.6%
Master	72	33%
Others	30	13.8%
Age		
20-30 years	62	28.4%
31-40 years	86	39.5%
41years and Above	70	32.1%
Experience using e-banking		
1-2 years	52	23.8%
3-4 years	98	45%
5 years and above	68	31.2%
Banks		
Allied Bank	24	11%
Habib Bank limited	72	33%
Muslim Commercial Bank	46	21.1%
Alfiah Bank	39	17.9%
United Bank limited	37	17 %

4.2. Assessment of measurement model

The measurement model measures the reliability and validity of items used to measure the construct of the present study. The current research has five constructs: reliability, mobile application design, trust, e-satisfaction, and e-loyalty. Where all construct items are reflective and adopted through previous studies. The loading, composite reliability is used to measure reliability and internal consistency. At the same time, the Average variance extracted is to measure the validity of items. Fornell and Larcker (1981) method was used to measure discriminant validity that how much constructs are distant from each other in the model.

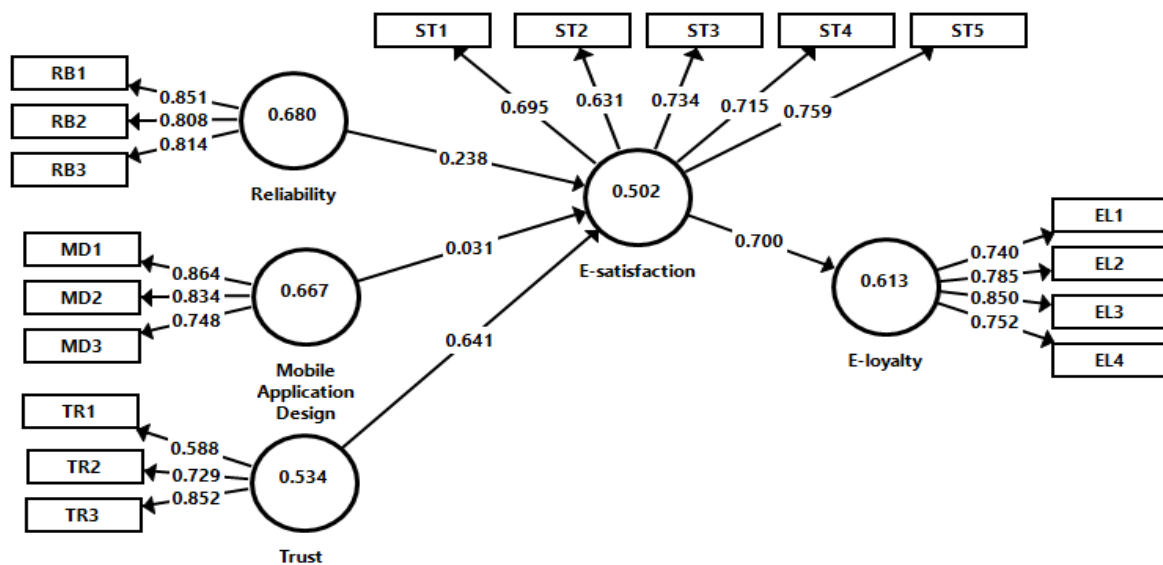


Figure 2: Measurement Model

4.2.1. Internal consistency, reliability, and convergent validity

Table 2 reflects the numbers of reliability and validity using Smart PLS. All five constructs loadings are more significant than 0.40 shows that all variables are internally consistent (Hair et al., 2017). The composite reliability values of all constructs are higher than 0.7, indicating no reliability issue ion constructs. While the average variance extracted value is more significant than 0.5, the ll variables of the current study are valid, and the model is reliable and accurate for further investigation.

4.2.2. Discriminant validity

Fornell and Larcker (1981) criteria were used to analyze the discriminant validity of the model. This method analyzes in a matrix where average variance extracted values are mentioned in diagonal places that must be higher than other competing values in rows and comments. For example, in table 3, all diagonal values square root of AVE is higher, showing there is no discriminant validity issued in the model.

Table 2
Internal consistency, reliability, and convergent validity

Construct	Items	Loadings	CR	AVE
Reliability	RB1	0.851	0.864	0.680
	RB2	0.808		
	RB3	0.814		
	RL4	0.784		
Mobile App Design	MD1	0.864	0.857	0.667
	MD2	0.834		
	MD3	0.748		
Trust	TR1	0.588	0.771	0.534
	TR2	0.729		
	TR3	0.852		
E-Satisfaction	ST1	0.695	0.834	0.502
	ST2	0.631		
	ST3	0.734		
	ST4	0.715		
	ST5	0.759		
E-Loyalty	EL1	0.740	0.863	0.613
	EL2	0.785		
	EL3	0.850		
	EL4	0.752		

Note : CR =Composite reliability , AVE =Average variance extracted

Table 3
Fornell and Larcker Criterion

	EL	ST	MD	RB	TR
E-Loyalty (EL)	0.783				
E-Satisfaction (ST)	0.700	0.708			
Mobile App Design (MD)	0.557	0.508	0.817		
Reliability (RB)	0.469	0.572	0.598	0.825	
Trust (TR)	0.562	0.774	0.524	0.494	0.731

Note: EL=E-loyalty, ST=E-satisfaction, MD=Mobile application design, RB=Reliability, TR=Trust

4.3. Structural Model Assessment

The outer model comprises the paths between the constructs that reflect the model's hypothesis examined in the structural model assessment. The researcher utilized the bootstrap method used to analyze the direct as well indirect paths in the model. The significance of the links was analyzed through beta values, T-values, P-values, and other effects size and R square value were examined.

4.3.1. Direct Hypotheses Testing

Table 5 shows the detail of the hypothesis. The first one demonstrates reliability on the e-satisfaction as the results show ($\beta = 0.238$, t value =3.405, p-value <0.05), as the results show a positive relationship. In hypothesis 2, mobile application design on the e-satisfaction, there is a negative relationship as the results ($\beta = 0.031$, t-value =0.519 p-value is more significant than 0.05) show no effect of the mobile application design on the customer satisfaction. While in hypothesis 4, trust on the e-satisfaction, there is a significant positive relationship on the building of the e-satisfaction as the results show ($\beta = 0.700$, t-value=0.046, p-value <0.05). In this study, the value of R^2 is 0.648 and 0.490, which is higher than 0.26, which portrays the substantiality of the model. Moreover, the statistical results found the values of Q higher than zero that depicts the predictive relevance of the current model.

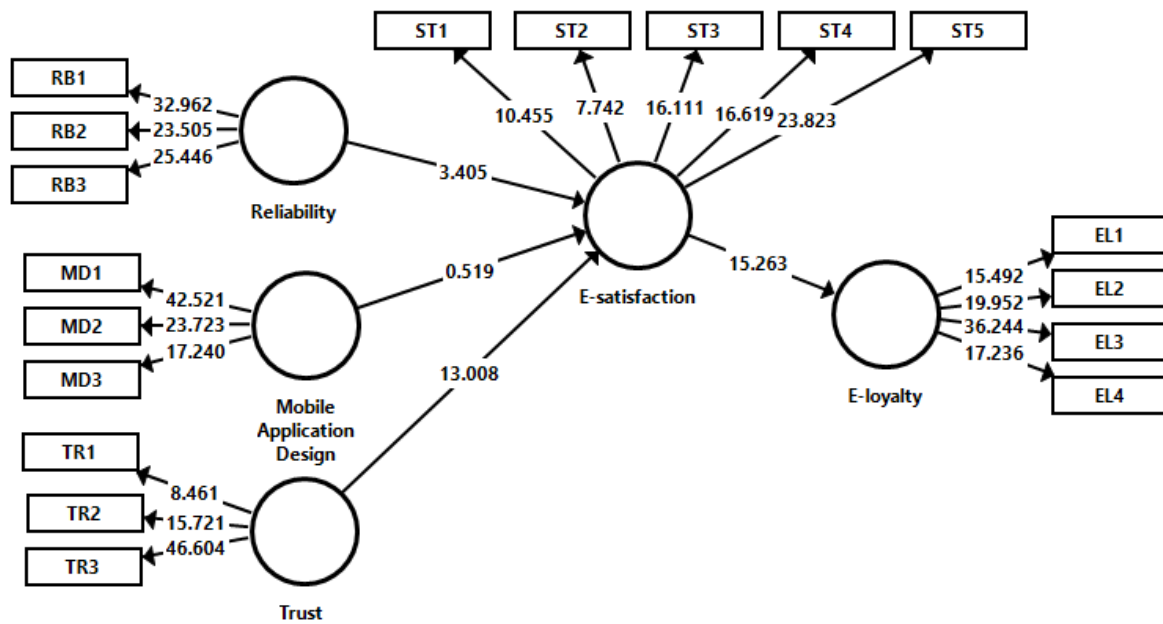


Figure 3: Structural Model

**Table 5
Direct Hypotheses Testing**

Hypo	R/S	Beta	Std	T-stat	P	2.50%	97.50%	Decision	R2	f2	Q2
H1	RL -> ST	0.238	0.070	3.405	0.001	0.084	0.373	Supported	0.648	0.096	0.302
H2	MD -> ST	0.031	0.059	0.519	0.006	-0.088	0.140	Not Supported		0.002	
H3	TR -> ST	0.641	0.049	13.008	0.000	0.531	0.734	Supported		0.786	
H4	ST -> EL	0.700	0.046	15.263	0.000	0.599	0.779	Supported	0.490	0.959	0.292

Note: EL=E-loyalty, ST=E-satisfaction, MD=Mobile application design, RB=Reliability, TR=Trust

4.3.2. Mediation Analysis

Bias corrected accelerated method using Bootstrap adopted in the present study to analyze the mediating impact of e-satisfaction between the independent variables. The results show that hypotheses 5 and 7 were supported, while hypothesis 6 was rejected because p values are higher than 0.05 and zero straddles between the upper and lower limits.

**Table 6
Indirect Hypotheses testing (Mediation analysis)**

Hypothesis	Relationship	Beta	Std. Er	T-stat	P	2.50%	97.50%	Decision
H5	RL -> ST -> EL	0.166	0.052	3.223	0.001	0.062	0.271	Supported
H6	MD -> ST -> EL	0.021	0.041	0.516	0.606	-0.058	0.100	Not Supported
H7	TR -> ST -> EL	0.448	0.037	12.079	0.000	0.381	0.523	Supported

Note: EL=E-loyalty, ST=E-satisfaction, MD=Mobile application design, RB=Reliability, TR=Trust

5. Discussion and conclusion

The purpose of this study is to check and increase e-banking loyalty by using high-quality e-banking environment services. As a result, it was proven that there is a significant relationship between e-reliability and e-satisfaction. Furthermore, the relationship between trust and e-satisfaction was also found substantial. However, the mobile application design did not find a considerable impact on e-satisfaction. These findings provide new insights as most people don't pay much attention to website design. Instead, they much consider reliability and trust. They are, however, concerned about website design reliability.

The indirect effect of reliability and trust was found significant through mediating role of e-satisfaction on e-banking loyalty that is in line with previous literature (Shiu-Wan, Cheng, & Chiu, 2019; Suherman & Usman, 2019). At the same time, mobile application design indirect path through e-satisfaction on e-banking loyalty did not see effective that depict that customer are not concerned about mobile application design while using e-banking services. Therefore, the present study is conducted in the non-contrived environment to know a significant quality determines factors including the reliability, mobile app design, and trust with the mediation of the e-satisfaction to see the building the e-loyalty that is in line with previous literature (Kaya et al., 2019; Pham et al., 2018).

6. Implications

This study is helpful both in the academic literature and in several practical implications. First, this study primarily focuses on the conventional banking sector of Pakistan to promote the quality of digital banking. This study is helpful for the upper management in making policymakers promotes digital banking. Moreover, this study is based on the CMR theory to support the theoretical framework. Second, this study mainly focuses on the reliability and quality of the Web design on the customers' loyalty in the Pakistani context to promote digital banking in the pandemic situation. The State Bank of Pakistan can make policies to handle the catastrophic situation in the country. The vital elements are trust, reliability, and the website design significantly influence the creation of loyalty. These policies are helpful in the result of commitment and satisfaction, in the long run, to build trust in their customers. This lockdown focuses on e-banking services that customers trust and can satisfy them via online banking platforms. Current research facilitates banks in strategic decision-making to improve Pakistan's e-banking future.

7. Limitations and future research recommendations

The study is confined to few limitations, which guidelines future directions for further research. First, the current analysis is limited to the Pakistan context and is based on a cross-sectional study. In the future, this model can be examined in other developed countries for generalizing our findings. Second, the present study only utilized the quantitative survey method. Third, the study considers reliability, trust, and mobile application design while future security and other quality factors may include further research. Fourth, prospective customer loyalty patterns may examine based on customer demographic profile.

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