





Mobile payment Application Quality and customer Loyalty: A Structural Equation Modeling Approach –BARIDI MOB case study-

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Abstract:

This study examines the relationship between mobile payment app quality and customer loyalty, using the Baridi Mob case. It also investigates the role of customer satisfaction as a mediator. The research model includes app design, privacy, security, reliability, and ease of use, as well as customer satisfaction and loyalty. Data analysis was based on 435 responses. The structural equation modelling technique was used to estimate the hypothesized relationships. The results show that reliability and ease of use have a positive impact on customer satisfaction. Customer satisfaction also has a positive effect on loyalty. Furthermore, customer satisfaction mediates the relationship between service quality and loyalty, with reliability and ease of use being fully mediated and app design being indirectly mediated. Security and privacy do not have a mediated relationship. These findings can be useful for Baridi Mob providers in managing services and improving quality and satisfaction.

Key words: mobile payment application, quality, customer loyalty, customer satisfaction, structural equation modelling

JEL Classification Codes: G21, O33, L15, M31, C52, C38

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Introduction :

The rapid development of technology has led to the emergence of online mobile applications in recent times. This technological advancement has resulted in a highly competitive business environment, where companies must adapt creatively to meet the demands of the market and foster innovation. Moreover, smartphones have become indispensable consumer products in this era of digitalization. (Aydin & Burnaz, 2016, p. 73), Using mobile apps in the financial and banking sector has become more prevalent. Banks and financial companies are creating mobile apps to meet user needs and enhance their development strategies. These apps enable customers to easily access, deposit, and transfer money, thereby improving the convenience and efficiency of banking. Baridi Mob is an example of a mobile payment application in Algeria that provides various electronic banking and postal financial services offered by Algeria Post.

General problematic:

This study stems from the following problematic

To what extent does mobile payment application quality impact customer loyalty in the context of Baridi Mob?

Partial Problematic:

- Does the use of mobile payment application have any impact on customer loyalty for Baridi Mob users?
- Does the use of mobile payment application have any impact on customer satisfaction for Baridi Mob users?
- Does satisfaction moderate the relation between mobile payment application quality, customer loyalty, and customer satisfaction?

General Hypothesis:

There is a significant relationship between mobile payment application quality and customer loyalty in the Baridi Mob case.

Partial Hypotheses:

1) Total effect model

H1. there is a positive a relationship between app design and loyalty

H2. there is a positive a relationship between privacy and loyalty

H3. there is a positive a relationship between security and loyalty

H4. there is a positive a relationship between reliability and loyalty

H5. there is a positive a relationship between ease of use and loyalty

2) Mediation model

H6. Satisfaction mediates the relationship between app design and loyalty

H7. Satisfaction mediates the relationship between privacy and loyalty

H.8 Satisfaction mediates the relationship between security and loyalty

H9. Satisfaction mediates the relationship between reliability and loyalty

H10. Satisfaction mediates the relationship between ease of use and loyalty

Objectives:

This study aims to analyse mobile payment application quality, customer satisfaction, and loyalty in the context of Baridi Mob. It investigates the impact of application quality on customer satisfaction and the relationship between satisfaction and loyalty among Baridi Mob users. It also explores how customer satisfaction mediates the connection between application quality and customer loyalty. This research provides valuable insights into customer loyalty dynamics in the mobile payment industry, benefiting Baridi Mob and similar providers.

Importance of the Study:

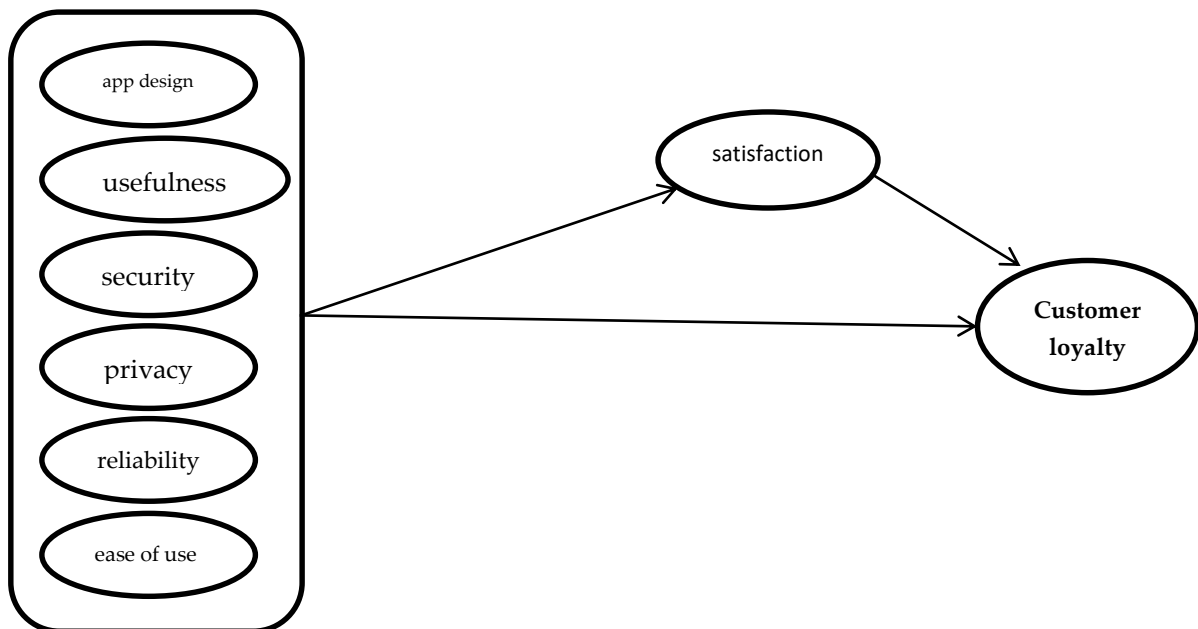
This study provides important information on the relationship between mobile payment app quality, customer satisfaction, and loyalty in the context of BARIDI MOB. The results have practical implications for Baridi Mob and similar providers, helping them improve their offerings and user experiences in the competitive mobile payment market.

Methodology applied

A total of 435 questionnaires were obtained electronically from Baridi Mob users by using Google form. The questionnaires were designed using a five-point Likert scale, ranging from 5 (strongly disagree) to 1 (strongly agree). Once the data was collected, it underwent editing and consistency checks before being analysed using two main approaches: descriptive and statistical. The descriptive approach employed measures such as standard deviation, reliability, and correlation analysis to provide an overview of the data. On the other hand, the statistical approach involved the use of structural equation modeling, specifically the analysis of moment structures (AMOS 23), with maximum likelihood estimation. This approach was used to test the formulated hypotheses, after ensuring the adequacy of the model and removing any items that did not perform well.

Figure 1. Represents the theoretical framework for the study

application quality dimensions



Source: made by researchers based on theoretical aspect

I. Literature review

1-1- Mobile payment application

The mobile application is a set of coded instructions used by a mobile device to solve a problem (ZAMFIROIU, 2014), In 1993, IBM released the world's first smartphone, which boasted numerous utilitarian applications similar to those found on the Psion. Following this, the next significant advancement in app technology occurred a decade later with the introduction of the BlackBerry Smartphone in 2002, which incorporated email capabilities. In 2010, Apple propelled apps to the forefront with the announcement of their infamous app store, which was launched a year later. (A Brief History of Mobile Apps, 2021), In the first quarter of 2023, there was a staggering number of almost 36.6 billion app downloads on the app store. Furthermore, the year 2022 witnessed a total of 142.6 billion app downloads, with Google Play accounting for 110.1 billion downloads and IOS with 32.6 billion downloads. (App Download Data (2023), 2023). Mobile applications are rapidly growing in importance and can be used for various purposes. (Alqahtani & Mohammad, 2015), They are widely used in e-payment.

The fundamental principles of electronic payment are rooted in the transfer of funds from one party to another via electronic means. The process of e-payment entails a transactional exchange of monetary funds that is initiated through electronic communication channels. (Yaakub, Ramli, Muhamed, & Izlawanie, 2016). in 1997, the Finnish company Sonera has launched the first mobile payment solutions, which allowed purchasing soft drinks at vending machines using mobile phones. (Dahlberg, Mallat, & Öörni, 2003). mobile payment providers and their offerings have rapidly increased in recent years. Google introduced its Wallet app in 2011, while Apple launched Apple Pay in 2014. (Zhong, 2015).

Mobile payments can be linked to users' credit or debit cards, phone bills, or prepaid deposits. They offer convenience for buyers by letting them make purchases from wireless devices, which lets them pay for goods or services wherever they are.

Enabling easier purchases, including those made on the spur of the moment, yields more income for merchants. Meanwhile, mobile-service providers get revenue from transactions carried on their networks. (Leavitt, 2010)

1-2- Mobile payment application quality

Mobile service quality (MSQ) is the quality of cellular services as a consumer assessment of the quality and superiority of cellular content delivery in the context of m-banking. (I Gusti Agung Ayu Mas & Ni Wayan Sri , 2020)

According to (Inzamam & Tahir , 2020) There are four dimensions of EBSQ, namely, reliability, privacy and security, website design and customer service and support of ebanking. And The study revealed that reliability and website design are important drivers of e-banking loyalty, especially during the COVID-19 pandemic. E-banking satisfaction fully mediated the relationship between e-banking privacy and security and e-banking loyalty. However, the indirect effect of reliability and website design on e-banking loyalty was only partially mediated. According to (Toqeer, Farooq, & Abbas, 2021) Previous studies have looked at dimensions such as website design, usefulness, security, privacy, reliability, and ease of use. Other studies have focused on the enjoyment derived from using mobile banking.

2- Customer loyalty :

One of the most common definitions of customer loyalty is the one offered by Jacoby and Chestnut (1978) who see this phenomenon as a behavioural result of consumers' preferences for a specific brand from a set of similar ones. Loyalty is a commitment to continue to make business with a company, on the long term, is a state of mind, a set of attitudes, beliefs or desires. (Claudia , 2013) and Loyalty can also be defined as the preferential response, attitude, and behaviour of one or more to the brand in the product category expressed over a period of time set by the consumer. Loyalty is present when favourable attitudes for the brand are manifested in the behaviour of repeat purchases. According to Anton (Akmal & Mahir , 2022)

According to those definitions, loyalty can be defined as a set of attitudes, beliefs, or desires that are expressed over time through repeated purchases and favourable behaviour towards the brand.

customer loyalty is a crucial measure of success for both current and future businesses. Companies benefit economically from loyal customers by strengthening their customer relationships and acquiring new customers at a lower cost. The attainment of customer loyalty is one of the most significant goals that businesses aspire to achieve. Loyal customers can serve as a valuable economic resource for companies and influence others with their recommendations and incentives, allowing the business to gain new customers at a lower cost. Therefore, establishing customer loyalty can provide a significant competitive advantage, preventing Customer losses, securing revenue streams, and making it easier to reach new customers.

Customers seek to trust the businesses they share value with and they want to know that their employees are interested in them. They do not want to encounter oppressive sales or hidden costs As customers become more conscious, they evaluate the adequacy and benefits of businesses, and this assessment increases their trust expectations. When customers become distrustful, it leads to their departure from the business, regardless of the scale or order of the business. By transforming customer satisfaction into loyalty, customer repurchases from the business increase, and they are willing to pay higher prices for their products. They also recommend the company to their surroundings, thereby bringing new cost-effective customers to the company. (Arslan , 2020)

In conclusion, companies must prioritize customer loyalty as it is a crucial aspect of their success. The establishment of customer loyalty can provide long-term economic benefits to companies, and it is an essential goal for businesses to strive for. Companies must strive to establish customer loyalty by building strong customer relationships and by providing value to their customers. By doing so, they can obtain a competitive advantage, prevent customer losses, secure revenue streams, and make it easier to reach

new customers. Businesses should also focus on gaining the trust of their customers and creating a positive customer experience that fosters customer loyalty.

3- Customer satisfaction:

The definition of customer satisfaction according to Engel, Blackwell and Miniard (2012) is a full evaluation where the alternative chosen is at least the same or exceeds customer expectations, while customer dissatisfaction arises when the results do not meet expectations. (Wahyudi & Endang , 2021)

Satisfaction can be defined as a post-choice evaluative judgment concerning a specific purpose decision and is mostly used as part of the confirmation/disconfirmation paradigm (Thakur, 2014)

According to (KOTLER & KELLER, 2012) Satisfaction is an evaluation made by an individual regarding a product's perceived performance in comparison with their expectations. Should the product's performance fail to meet the customer's expectations, disappointment is experienced. Conversely, if the performance aligns with the customer's expectations, satisfaction is attained. In cases where the performance exceeds the customer's expectations, delight is experienced.

II. RESEARCH METHODOLOGY

1- Baridi Mob definition:

BaridiMob is a mobile application that offers postal payment and financial services from Algeria Poste. It assists in optimizing time, managing the postal current account, and conducting operations from any location and at any given time. BaridiMob offers a range of services including consultation of postal current accounts, managing electronic payment cards, account transfers, geolocation of ATMs, blocking and unblocking cards, and accessing mini summaries of card transactions. (Algérie poste)

2- Demographic Characteristics of the Sample

The demographic items of the respondents, including gender, age, educational background, and the initiation date of app usage, were examined through a survey.

Table 1 displays the characteristics of the respondents. The distribution of individuals according to their sex revealed a higher proportion of 336 males (77.2%) and 99 females (22.8%). In relation to the distribution of age, 39 individuals (9%) were below the age of 25, 160 individuals (36.8%) were between the ages of 25 and 35, 176 individuals (40.5%) were between the ages of 35 and 45, and 60 individuals (13.8%) were above the age of 45. Notably, there was a relatively high representation of individuals in their twenties and forties. With regards to educational attainment, the majority of participants, amounting to 363 individuals (83.4%), held college degree, followed by 60 individuals (13.8%) who had completed high school, and 12 individuals (2.8%) who had an education level below high school. Regarding the date that the respondents have started using the app showed a similar ratio of 139 respondents have used it “Since the 2019-2021 Corona pandemic” (31.8%) and 136 respondents (31.1%) have used it since 2022, and 162 respondents (37.1%) since 2018

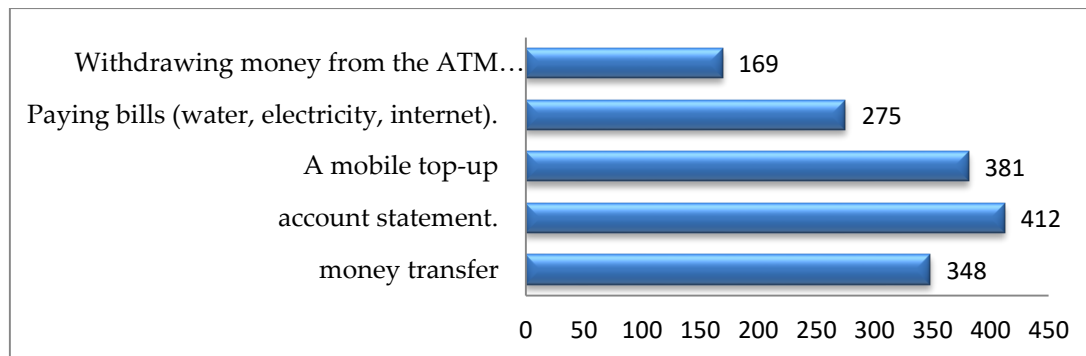
Table 1: Characteristics of respondent

Variable	Category	Frequency	Percentage
Gender	male	336	77.2%
	female	99	22.8%
age	below 25	39	9%
	25 - 35	160	36.8%
	35 - 45	176	40.5%
	over 45	60	13.8%
Education level	Below high school	12	2.8%
	high school	60	13.8%
	college	363	83.4%
Since when have you started using the app	since 2018	162	37.1%
	Since the 2019-2021 Corona pandemic	139	31.8%
	since 2022	136	31.1%

Source: SPSS v26 outputs

Figure 1 displays application uses, it is evident that the majority of participants use the application for the purpose of checking account statement (94.3%), for A mobile top-up(87.2%), For money transfer (79.6%), for paying bills(62.9%), and for Withdrawing money from the ATM machine without a debit card (38.7%)

Figure 2: application uses



Source: Google Form Outputs

3- Analysis of results

3-1- Validity Analysis

The next step in the analysis was to test the validity, which is reported in detail in the following sections. Construct validity, including both convergent and discriminant validity, was assessed by using average variance extracted (AVE) and by examining the correlations between the variables. The following section discusses constructs validity.

3-1-1- Convergent validity

Table 3 summarizes the model results of the convergent validity.

The AVE should be at least 0.5 and the composite reliability should be >0.60 . (Bagozzi & Yi, 1988) The measurement model displayed a composite reliability that surpassed the recommended threshold of 0.60 for all latent variables. Consequently, the model demonstrates adequate convergent validity.

3-1-2- discriminant validity

Fornell and Larcker (1981) proposed a methodology to evaluate the discriminant validity. They contended that if the correlation between two composite constructs did not surpass their respective reliability estimation, then the existence of discriminant validity could be affirmed. On the basis of Table 3, it becomes evident that the square root of the Average Variance Extracted (AVE) for a specific construct exceeds the absolute value of the standardized correlation between that construct and any other construct in the analysis [$AVE > \text{correlation}^2$]. (Fornell & Larcker, 1981, pp. 45-46)

Table 2: Validity Analysis

	CR	AVE	APP DESIGN	SECURITY	PRIVACY	RELIABILITY	EASE OF USE	SATISFACTION	LOYALTY
APP DESIGN	0.857	0.547	0.739						
SECURITY	0.880	0.786	0.684***	0.886					
PRIVACY	0.948	0.859	0.506***	0.783**	0.927				
RELIABILITY	0.847	0.649	0.773***	0.857**	0.710***	0.806			
EASE OF USE	0.922	0.748	0.687***	0.584**	0.464***	0.598***	0.865		
SATISFACTION	0.943	0.768	0.724***	0.721**	0.571***	0.813***	0.658***	0.876	
LOYALTY	0.984	0.954	0.591***	0.613**	0.493***	0.695***	0.556***	0.765***	0.977

Source: AMOS v23 outputs

3-2- Measurement model

Table 3: measurement model fit indices

Fit index	Recommended value	Indices values	
Chi-square/DF	≤3.00	3.029	acceptable fit
Goodness of fit index (GFI)	≥0.80	0.820	acceptable fit
Root mean square error of approximation (RMSEA)	0.05 to 0.08	0.068	acceptable fit
SRMR	0.05 to 0.08	0.0745	acceptable fit
TLI	≥0.9	0.915	acceptable fit
CFI	≥0.9	0.925	acceptable fit

Source: AMOS V23 Outputs

Based on table 2 above, the six Goodness of Fit Index (GOFI) criteria show an acceptable fit, meaning that the analysis model can be used in this study.

Table 4: Direct, indirect, and total effects of Model Generating

	Total effect	Indirect effect	Direct effect	results

	H	P value			P value		P value		
LOYALTY<--- APP DESIGN	H1	0.911	Not sig	H6	0.253	+ sig	0.792	Not sig	Indirect relationship
LOYALTY<--- SECURITY	H2	0.901	Not sig	H7	0.677	Not sig	0.973	Not sig	No relationship
LOYALTY<--- PRIVACY	H3	0.756	Not sig	H8	0.654	Not sig	0.890	Not sig	No relationship
LOYALTY<--- RELIABILITY	H4	0.002	+ sig	H9	0.001	+ sig	0.216	Not sig	Full mediation
LOYALTY<--- EASE OF USE	H5	0.027	+ sig	H10	0.003	+ sig	0.362	Not sig	Full mediation

Source: AMOS V23 Outputs

For this study, the mediating effects of satisfaction in the relationship between application quality dimensions and loyalty were tested.

Based on testing of mediation finding in the table above, satisfaction is a mediating effect for the relationship between loyalty and app design, which is not supported but there is indirect relationship. Satisfaction is a mediating effect for the relationship between loyalty and security, which is not supported (no relationship) Furthermore mediating effect of satisfaction is not supported between the relationship of loyalty and privacy. The direct effect between the relationship of loyalty and privacy is significant, in addition, the finding indicates full mediating effect is supported for attitude between the relationship of loyalty and ease of use. And also for the relationship between loyalty and reliability which there is a full mediation.

3-3- HYPOTHESIZED MODEL ANALYSIS

3-3-1- Goodness-Of-Fit indices of Hypothesized Model:

AMOS v23 Graphics was used to run the structural model and test the hypothesized relationship between constructs. The final modified model in Figure 2, yields a 692.597 (chi-square), degree of freedom = 253 and P-value = 0.000 which is not significant at the level of 0.050), indicating that the model fits the data very well except the P-value. it is more appropriate to look at other fit measures.

Fortunately, other fit measures also indicate the goodness of fit of the model to the data (CMIN/DF = 2.738, RMSEA =0.063, TLI 0.954, CFI .961, NFI = 0.966, GFI = 0.8, SRMR = .0417).

Table 5: Regression Weights

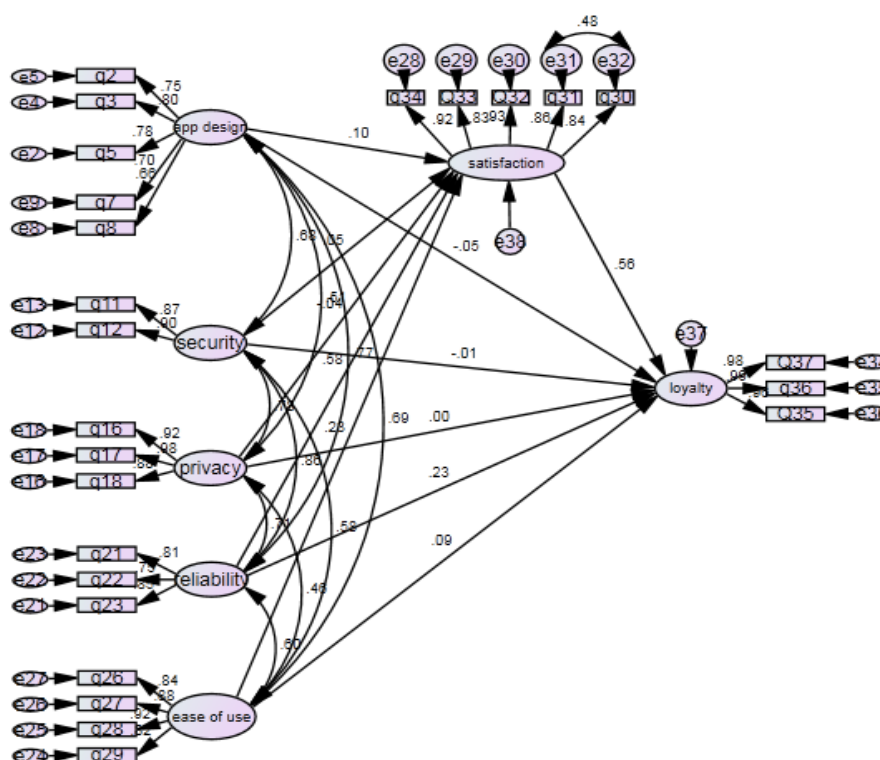
			Estimate	S.E.	C.R.	P	
SATISFACTION	<---	APP DESIGN	.097	.069	1.403	.161	NOT SUPPORTED
SATISFACTION	<---	SECURITY	.042	.085	.495	.620	NOT SUPPORTED
SATISFACTION	<---	PRIVACY	-.036	.053	-.673	.501	NOT SUPPORTED
SATISFACTION	<---	RELIABILITY	.609	.116	5.272	***	SUPPORTED
SATISFACTION	<---	EASE OF USE	.237	.051	4.626	***	SUPPORTED
LOYALTY	<---	SATISFACTION	.573	.073	7.821	***	SUPPORTED
LOYALTY	<---	APP DESIGN	-.045	.072	-.633	.527	NOT SUPPORTED
LOYALTY	<---	SECURITY	-.005	.088	-.060	.952	NOT SUPPORTED
LOYALTY	<---	PRIVACY	-.003	.056	-.058	.954	NOT SUPPORTED
LOYALTY	<---	RELIABILITY	.249	.132	1.894	.058	SUPPORTED
LOYALTY	<---	EASE OF USE	.091	.056	1.616	.106	NOT SUPPORTED

Source: AMOS V23 Outputs

To evaluate hypotheses, the significance of each path coefficient, estimate of regression weight, standard error of regression weight, and critical ratio for regression weight were assessed. Table 5 provides the C.R., Estimate, and S.E. for each parameter in the Model Generating.

As indicated in Table 5, the hypotheses (H3, h4,h5,h8,H9,H10) are rejected based on significant C.R. values. The remaining hypotheses are deemed acceptable since their C.R. values are below 1.96. However, when considering the measured variable, it is not statistically significant as its C.R. value is lower than 1.96

Figure 3: hypothesized structural model result of model generating



Source: AMOS V23 Outputs

conclusion

In conclusion, this study has conducted an extensive examination of the relationship between the quality of mobile payment applications, customer satisfaction, and customer loyalty in the specific context of baridi mob. The research model, which encompasses critical dimensions such as application design, privacy, security, reliability, and ease of use, in addition to customer satisfaction and loyalty, has yielded enlightening findings.

the analysis, has employed the structural equation modeling technique, has brought forth the following significant outcomes:

- **Positive Influence of Quality on Satisfaction:** The study has verified that both reliability and ease of use have a substantial positive impact on customer satisfaction. This underscores the significance of ensuring a smooth and dependable mobile payment experience in order to enhance user satisfaction.
- **Satisfaction Stimulates Loyalty:** Customer satisfaction has emerged as a powerful catalyst for customer loyalty, underscoring the crucial role of user contentment in fostering enduring loyalty among Baridi Mob users.
- **Mediating Role of Satisfaction:** Customer satisfaction has been found to mediate the relationship between service quality and customer loyalty. Specifically, reliability and ease of use have been fully mediated by customer satisfaction, while application design has been indirectly mediated.
- **Security and Privacy:** Interestingly, security and privacy have not exhibited a mediated relationship with customer loyalty in this particular context, suggesting that although important, these factors may not be the primary drivers of loyalty among Baridi Mob users.

These findings offer valuable guidance for Baridi Mob and similar service providers, enabling them to refine their services, enhance quality, and prioritize user

satisfaction as a means of fostering enduring customer loyalty. In an ever-evolving digital landscape, comprehending these dynamics is of utmost importance.

here are some recommendations for mobile payment providers to enhance their services and improve user satisfaction and loyalty:

- Streamline the process of setting up an account and the initial usage of the Baridi Mob application.
- Minimize unnecessary steps and complexity to facilitate an effortless start for users.
- Allocate resources towards the improvement of user interface (UI) and user experience (UX) design. A sleek, intuitive, and visually appealing interface holds the potential to significantly augment the user experience.
- Give priority to the security and privacy of user data. Implement robust encryption and authentication measures to safeguard user data. Clearly communicate your unwavering commitment to user privacy.
- Ensure the reliability and availability of the Baridi Mob application. Consistent downtime or technical issues could undermine user confidence and satisfaction.
- Provide responsive and efficient customer support. Users should have easy access to assistance whenever required, and their concerns should be addressed promptly.
- Ensure seamless functionality of the Baridi Mob application across diverse devices and operating systems, thereby maximizing accessibility.
- Continuously optimize the performance of the application to reduce loading times and guarantee swift and dependable transaction processing.

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