

The influence of e-service quality, e-trust, on e-loyalty QRIS BCA with mediation by e-satisfaction (study on QRIS BCA users in Jakarta)

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Abstract

Purpose: This study investigates the influence of E-Service Quality and E-Trust on E-Loyalty, with E-Satisfaction as a mediating variable, in the context of BCA QRIS users in Jakarta. The research is motivated by the growing trend of digital payments, especially QRIS-based transactions, which have shown significant growth in volume according to ASPI Indonesia.

Methodology/approach: A quantitative approach was employed using primary data collected via an online questionnaire distributed through Google Forms. The study involved 113 active BCA QRIS users selected through purposive sampling. Data were analyzed using the Structural Equation Modeling (SEM) method with SmartPLS 4.0 software. The measurement scale used was a 5-point Likert scale.

Results/findings: The results revealed that: (1) E-Service Quality has a positive but not significant effect on E-Loyalty; (2) E-Trust does not significantly influence E-Loyalty; (3) E-Service Quality has a positive but not significant impact on E-Satisfaction; (4) E-Trust positively and significantly influences E-Satisfaction; (5) E-Satisfaction significantly affects E-Loyalty; (6) E-Service Quality does not affect E-Loyalty through E-Satisfaction; (7) E-Trust positively affects E-Loyalty through E-Satisfaction.

Conclusions: E-Satisfaction plays a crucial mediating role between E-Trust and E-Loyalty. However, E-Service Quality does not significantly influence E-Loyalty, either directly or indirectly.

Limitations: The study is limited to a specific geographical area (Jakarta) and a relatively small sample size. Data collection was conducted online, which may introduce response bias.

Contribution: This research contributes to the literature on digital payment behavior and provides managerial implications for enhancing user trust and satisfaction to foster loyalty.

Keywords: *E-Servqual, E-Loyalty, E-Satisfaction, E-Trust, QRIS BCA*

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1. Introduction

In Google research, Temasek released its latest report entitled "e-Conomy SEA 2024." In the Temasek 2024 report, it is known that there is an increase in Southeast Asia's Internet economy by 13% from 2023 to 2024; this is also increasing even with a projected growth CAGR in 2030, which is growing by \$200-360 million. In its report, Temasek also revealed that the adoption of digital financial services is

increasing rapidly, and it is known that more than 19% of users have switched to digital services, where the existence of cash has begun to decrease.

However, there are several challenges in dealing with the loyalty of QRIS users, namely the Level of Personal Data Security, which is still a challenge for QRIS users, while there are also other challenges, namely QRIS Misuse, Not knowing how to use, and the network often errors when using QRIS (Sriantika & Abidin, 2024). This is similar to a survey conducted by Populix (2024), namely in the survey results stating that there are a number of barriers when using QRIS, such as the limited number of merchants who do not accept payments using QRIS. This is still often found with a percentage of 51%; then, there is a slow network that often results in disrupted payments, which is 50%. In an all-digital and fast-paced era, loyalty has become an important need that must be considered in banking management. There are forms of electronic loyalty that can benefit the company, namely, the increase in third-party funds placed in the bank, the return of customers to visit banking websites, and the faithful use of digital and electronic banking products (Cahaya, Mursitama, Hamsal, & Tjhin, 2023).

According to Nadhifa (2023), customer loyalty in the context of service marketing is a response that is closely related to promises or pledges to uphold commitments that underlie the continuity of the relationship and are usually reflected in continuous purchases from the same service providers based on pragmatic commitments and constraints. Customer loyalty is created from product quality, service quality, environmental quality, and a variety of products that consumers perceive through customer satisfaction (Amadea, Suryaputra, & Sondakh, 2022). Reporting from the testing of Marati, Faisal, Anggoro, and Anwar (2021) electronic loyalty is a form of behavior and commitment from customers to service providers or products so that it causes an intention to make repurchases or reuse from the company in the future and not from other companies.

Customer satisfaction is an important aspect of marketing that plays an important role in determining the success of a product or offer. The ability of a product to provide value and satisfaction to customers is the main indicator of its success. When a product performs well and meets or exceeds customer expectations, it indicates satisfaction (Susanto, Manek, Setiawan, & Mustikasari, 2023). Electronic satisfaction is a psychological condition that occurs when customers feel satisfied and are no longer looking for alternatives to the website or application they are using. When customers are not satisfied, they will look for alternatives, thus allowing competitors to take advantage of this situation (Hidayah & Utami, 2017).

Meanwhile, there are conflicting research results, based on other research from Ashiq and Hussain (2024), explaining that the mediation of electronic satisfaction on the effect of electronic service quality or electronic trust on electronic loyalty does not have significant significance. This implies that online shopping behaviors and consumption patterns are largely driven by a preference for loyalty to a brand or platform rather than satisfaction with it. Other research results that are in the same rhythm, namely from the study of So, Yang, and Li (2025) explain that e-service quality and e-trust have no effect on e-customer loyalty, so it can be concluded that the e-satisfaction variable is not proven to be a mediating variable for these variables, because e-customer loyalty digital payment is not determined by the two variables e-service quality and e-customer satisfaction.

According to Pratama, Prasetyo, and Ramli (2023), testing for the variable e-trust does not have a positive effect on E-Loyalty. That the results of data analysis show that E-Service Quality has a positive and significant effect on E-Loyalty but E-Trust has a negative and insignificant effect on E-Loyalty. E-trust did not have a positive effect on e-customer loyalty (Prasetyo, 2024). Owing to the phenomenon and research gap (inconsistency of the influence of independent variables on dependent variables), it can be concluded that researchers are interested in using the research object, namely, QRIS BCA, to test these variables.

2. Literature review

2.1. E-Loyalty

In the context of online customer loyalty, it refers to the pattern of online user behavior where users are committed to the service provider continuously using the *platform* (Baabdullah, Alalwan, Rana, Kizgin, & Patil, 2019). In the context of digitalization, *e-loyalty* can encourage users to conduct repeated electronic transactions in the future. E-loyalty is a user's commitment and attitude towards the use of products or services offered through various websites, and can be the key to ensuring the occurrence of repeated electronic transactions in the future. Users who feel emotionally or functionally bound tend to be more loyal and more likely to make recommendations to pay using the QRIS (Bella Lorenza, 2024).

There are benefits to organizations if they are able to retain loyal customers or increase customer loyalty, including being able to increase the company's profitability or *revenue* in the long term and being able to increase positive recommendations from customers who have been satisfied with the company's services and products. The four aspects that can be studied in consumer loyalty are as follows: repeated purchases of customer goods or services, loyal and loyal customers are able to provide positive recommendations, and can even show brand resilience to their competitors (Putera & Famiola, 2024).

2.2. E-Satisfaction

In the competitive Indonesian banking world, achieving customer satisfaction and loyalty is important for achieving market dominance and long-term success (Yolanda & Handayan, 2024). According to (Amoroso & Lim, 2017) when the performance of the service provider improves, then consumers are likely to have a higher level of satisfaction and tend to repeat purchases or use with sustainable intentions; thus, on the other hand, the dissatisfaction felt by consumers will certainly turn to other service providers. Customer satisfaction is a behavior in which customers compare service performance with consumer expectations (Schiebler, Lee, & Brodbeck, 2025).

Electronic Satisfaction is one of the most important factors that determine good loyalty in *online* and *offline* business activities. Customer satisfaction indicates the level of excitement that consumers feel when their purchase and post-purchase experiences exceed their expectations. Meanwhile, another definition explains that electronic customer satisfaction includes all experiences that will be obtained by customers. In this case, the experience presents a certain amount of comfort and satisfaction, which is the result of the company's ability to meet customer expectations and meet their wants and needs related to digital services. Customer satisfaction is related to trusted high-tech e-banking services, business performance, and customer intent. When customers are satisfied, the impact is on business performance, which also increases so that the business can grow (Kaya, Behraves, Abubakar, Kaya, & Orús, 2019).

2.3. E-Service Quality

In fact, electronic service quality is a term that is the latest version of commonly known service quality, thus it can be interpreted that electronic service quality is an adaptation and expansion of the service quality model that has been developed into an online or online ecosystem (Fang, Qu, & Wang, 2023). Explained that the quality of electronic services is a measure of the quality of electronic services provided by a business or organization through *online platforms* such as websites, mobile applications, or other electronic communication systems. The quality of electronic services is a way to measure how satisfied customers are with the services in the network. Of course, if the availability of the services offered can facilitate the transaction process, it can affect customer behavior after the transaction. *E-Service Quality* refers to the assessment that the company makes of customers to review the services that have been provided through electronic or online platforms, such as websites, applications, or online customer service (Lesmana & Balqiah, 2023). Meanwhile, the quality of electronic services can also be explained as *e-service quality*, which is the ability that can be provided by the company online or *virtually* for customers. *Service quality*, known as *e-service quality*, is a new version of *service quality* (service quality) that was developed to evaluate a service provided on the Internet (Arvianti, Mulyaningsih, Nugbara, & Oktini, 2023).

2.4. E-Trust

According to another opinion regarding online consumer trust, it is stated that there are consumer expectations regarding the features of the reliability and trust of a service provider in fulfilling its business commitments, so from this it is explained that trust involves the willingness of consumers to make transactions online, which is based on positive expectations for consumer behavior in the future. Trust always plays an important role in gaining loyal customer loyalty and bringing about brand sustainability because if a brand is no longer trusted by its customers, it will be difficult for the brand to achieve a large market share and attract customers. *E-trust* can be defined as the formation of attitudes between customers and sellers, including consumer beliefs and expectations regarding characteristics related to trust from online sellers. *Electronic trust* describes a number of *customer expectations* regarding the trust and reliability of service providers in fulfilling the commitments that have been promised from the beginning (Arvianti et al., 2023). *E-trust* can be described as the expectations of customers based on the reliability and trust of the service provider, which aims to fulfill its commitments. It is also explained that *trust* involves the willingness of consumers to make *online* transactions in the hope of getting positive shopping behavior in the future. To strengthen consumer trust in online purchases, companies should build customer satisfaction obtained from satisfactory and successful service to achieve customer expectations (Kuska, Wijayanto, & Santoso, 2024).

2.5. Research Concept Model

E-loyalty increases if *e-satisfaction* mediates the influence of *e-service quality* and *e-trust*. Thus, the research concept model is as follows:

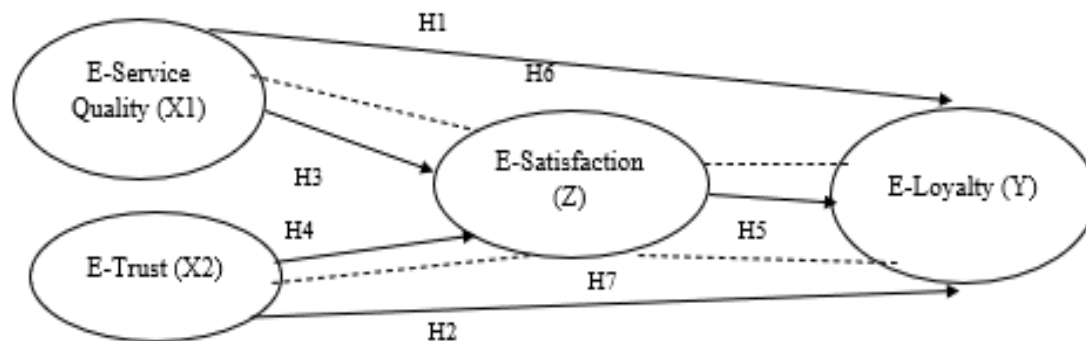


Figure 1. Research Concept Model

2.6. Hypothesis Development

2.6.1. The Effect of E-Service Quality on E-Loyalty

Starting from problems or obstacles regarding the lack of success in the implementation of *QRIS BCA's e-service quality*, which states that a number of complaints or complaints related to the slow service of QRIS, slow service, irresponsible, and so on. Thus, BCA's *e-service quality* needs to be improved to increase the loyalty of its users. The loyalty of electronic customers during their journey is highly dependent on the quality of the electronic services provided. Over time, it is often found that if many *complaints* are felt due to unsatisfactory electronic services, it certainly causes customers to no longer want to transact (Latifah & Wahyuningsih, 2023).

There is a significant influence between *e-service quality* and *e-loyalty*; thus, the results of the study show that an increase in *e-loyalty* can be easily realized if banking customers provide electronic services with good quality, so that customers will always transact digital services offered by banks. The higher the quality of electronic services perceived by customers, the higher their loyalty (Rezeki, Majid, & Kassim, 2023). In line with the results of other research, Fatikah and Albanna (2022), conducted research on the influence of *e-service quality* on *e-loyalty* through *e-satisfaction* of banking customers who use the *e-banking* application. Based on the tests, it was found that *E-Service Quality* has a positive and significant effect on *E-loyalty* both directly and mediated by *E-Satisfaction*.

H1: E-Service Quality has a positive and significant effect on E-Loyalty

2.6.2. The Influence of E-Trust on E-Loyalty

More and more challenges that emerge, such as security issues in using BCA's QRIS, are still complained about by users in various conditions, such as what happens when using QRIS, where users feel the loss of a considerable amount of balance, which is worth tens of millions. Therefore, a number of challenges to *e-trust* often confront BCA, and the company should be more active in increasing the trust of its users by overcoming fraud cases and phishing even better. States that E-Trust has a significant influence on *E-Loyalty* in Bank Syariah Indonesia. This finding indicates that integrity, friendliness, and competence affect customer loyalty. In line with this study, it was found that there were similarities in the results. As done by Melinda, Usman, and Aditya (2023), *the e-trust* variable has a positive effect on *e-loyalty*. These results indicate that mobile banking application users have high *e-loyalty* to the application because they trust the online banking services.

The results of other studies also found similar things, namely, as done by Rahmawati and Ramli (2024), stating that the results of *the e-trust* test have a positive and significant influence on *the e-customer loyalty variable*, so that the results of the study reflect this positive relationship explaining that banks have succeeded in convincing their users or customers with the element of trust, so trust is very important to create loyalty online. Which states that *e-trust* has a positive effect on *e-loyalty*.

H2: E-Trust has a positive and significant effect on E-Loyalty

2.6.3. The Effect of E-Service Quality on E-Satisfaction

The quality of electronic services includes various aspects such as transaction speed, system availability, ease of use, security, and the quality of customer service. The quality of electronic services plays an important role in influencing usage decisions because users often evaluate a service based on its quality before deciding whether to use it. Even so, there are still several obstacles or complaints experienced by users, such as slowness, errors in the application, transactions that are often cut but the balance does not enter, and so on. Therefore, it is important to improve the quality of application e-services to overcome the problem of user dissatisfaction.

Based on the results of research conducted by Melinda et al. (2023), it is stated that *the e-trust* variable has a positive and significant effect on *e-satisfaction*. Therefore, building and maintaining trust in *online banking services* is important because it has a direct impact on satisfaction with the services provided by *mobile banking applications*. Stating that *e-service quality* has a positive and significant effect on *e-satisfaction* directly. Thus, the better the service provided by *the e-wallet*, the more likely users are to feel satisfied. Who show that *absolute e-service quality* variables can affect *e-satisfaction*.

H3: E-Service Quality has a positive and significant effect on E-Satisfaction

2.6.4. The Influence of E-Trust on E-Satisfaction

If customers become confident in a company, they will always make repeat purchases and recommend them to others. Thus, companies can achieve high customer retention, increase customer loyalty, and even be able to achieve long-term growth quickly (Sari and Muna, 2024). However, several conditions still cause distrust among users, such as those experienced by some users when operating the *platform*. The obstacle is the delay of the bank in returning the balance that has been deducted in 2024 because the waiting time has to wait approximately three weeks. Therefore, it is important to increase users' trust in *payment platforms*. The results of a research study by Melinda et al. (2023) show that the independent variable, namely *the e-trust variable*, has a positive and significant effect on the bound variable, namely *e-satisfaction*. Therefore, building and maintaining trust in *mobile banking* is very important because it directly impacts satisfaction with the services provided by *mobile banking applications*.

Other similar studies have shown similar results. The research studied by Bella Lorenza (2024) explains that there are indications of the influence of *e-trust* on user *e-satisfaction*, with these results clearly stating that the trust factor owned by *digital payment platforms* has an influence on electronic satisfaction to be higher. Thus, it can be concluded that the higher the percentage of electronic trust felt by users of the *platform*, the higher the level of satisfaction with the services of the *online platform*.

H4: E-Trust has a positive and significant effect on E-Satisfaction

2.6.5. The Effect of E-Satisfaction on E-Loyalty

E-loyalty is the positive attitude of customers who remain loyal to making repeat purchases, revisiting the company's website, and even recommending products or services to their friends and close relatives. Over time, the customer satisfaction factor is believed to affect *e-loyalty* because the customer satisfaction factor is a measure of the gap between expectations and reality received or felt by customers. The importance of electronic satisfaction with payment *platforms* is increasingly challenging for banks because there are cases of concern such as the risk of slow networks, technical problems, fraud or fraud, risks to transaction security, news that QRIS Tap cannot be used on Iphones, and so on (Budaya, 2023). Other researchers also showed the same thing that *the variable e-customer satisfaction* has a positive effect on *e-customer loyalty* in digital payment application users, which means that if *the e-customer* satisfaction of users increases, it will have an impact on increasing *e-customer loyalty* in the application users. With these results, it is interpreted that if more users are satisfied with the feeling of being happy with banking services, it should be easier to create user loyalty (Zuliestiana & Setiawan, 2022).

H5: E-Satisfaction has a positive and significant effect on E-Loyalty

2.6.6. The Effect of E-Service Quality on E-Loyalty through E-Satisfaction

With the change in people's habits to rely on digital payment platforms, the obstacles experienced by users in their experience are increasingly developing, namely the vulnerability of *transaction troubles*, for example, double balance deductions, transaction delays, and lack of responsiveness in handling complaints. The success of *online* transactions using digital payments depends not only on the products or services offered but also on the *experience* provided to users during *online* interactions. It covers all aspects of electronically delivered services, including the user interface, transaction speed, security, and customer support. Therefore, the quality of electronic services plays an important role in building customer loyalty (Purba, Wisnalmawati, & Kusmantini, 2024).

In Indonesia, high-quality electronic services and long-term customer loyalty are related to consumer satisfaction with applications. Online customer satisfaction is a mediator between service quality and customer loyalty. There is an indirect influence between *e-service quality* and *e-loyalty* through *e-satisfaction*, so it can be concluded that the *E-satisfaction variable* is significant as a mediator of the relationship between *e-service quality* and *e-loyalty*. States that electronic satisfaction significantly mediates the influence of the quality of electronic services on *e-loyalty*. This makes customer satisfaction a vital role in impacting the quality of customer electronic services with their loyalty.

H6: E-Service Quality has a positive and significant effect on E-Loyalty through E-Satisfaction

2.6.7. Influence between E-Trust on E-Loyalty through E-Satisfaction

E-trust is believed to be customers' willingness to transact online with banks in the hope that the company will be obliged to fully monitor the services it provides. Trust is the trust in the ability of a service provider with a specific task to manage and provide services. Service users expect that the services offered by employees can be trusted. *E-trust* plays an important role in creating a strong level of *e-loyalty*.

Trust will arise because consumers use their products or services and can feel the maximum benefits. The results prove that *e-trust* has a positive and significant effect on *e-customer loyalty* through *e-customer satisfaction*. The provider should be committed to forming loyalty to consumers and the company must create a sense of trust in satisfactory service. there is an indirect influence between *E-trust* and *E-loyalty* through *e-satisfaction*, so it can be concluded that the *E-Satisfaction variable* is significant as a mediator of the relationship between *E-trust* and *E-loyalty*. *The variable e-trust* through *e-satisfaction* affects *e-loyalty*. Through these results, the influence of *e-trust* on *e-satisfaction* is caused by the user's experience in using *mobile banking* applications, thus making users loyal by using *mobile banking* continuously (*e-loyalty*).

H7: E-Trust has a positive and significant effect on E-Loyalty through E-Satisfaction

3. Research methodology

3.1. Research Object

The objective of this research is to focus on *E-Loyalty* with its supporting variables, namely E-Service Quality, E-Trust, and E-Satisfaction. Meanwhile, the subjects of the study are known to be the active users of the BCA QRIS application in the Jakarta area. The population used in this study was QRIS BCA users who are domiciled in the Jakarta area. Referring to this research, the location of the research is the city of Jakarta. In this study, the number of QRIS users cannot be known. In this regard, to determine the size of the population that cannot be known with certainty, in an effort to determine the size of the sample, the formula from Ghozali was used.

3.2. Variable Operations

In this study, three types of variables were used: Independent Variables (X), Bound Variables (Y), and Mediation Variables (Z). The independent variables in this study are *e-service quality* and *e-trust*. Meanwhile, for the dependent variable, namely, using *e-loyalty*, and for the intervening variable (Z), e-satisfaction is applied. Meanwhile, the explanation of the operational definition of the research variables is as follows:

Table 1. Variable Operationalization

Variable	Indicators
E-Service Quality (X1) Defined as the ability that can be provided by a company online or virtually that it makes for customers (Wilis & Nurwulandari, 2020).	<ol style="list-style-type: none">1. Efficiency2. Fullfilment3. System Availability4. Privacy5. Compensation6. Contact
E-Trust describes a number of customer expectations regarding the trust and reliability of service providers in fulfilling the commitments that have been promised from the beginning. Hapsari and Setyawan (2023)	<ol style="list-style-type: none">1. Honest2. Dependability3. Competence4. Integrity5. Willingness to depend
E-Satisfaction is stated that customer satisfaction electronically or online is defined as an experience that is able to be felt by the customer, where this is felt after using the services offered by the company, the customer has compared the perceived quality to the quality he expects. Gounaris in Nasution et al. (2019)	<ol style="list-style-type: none">1. Convenience2. Merchandising3. Site Design4. Serviceability5. Security
e-Loyalty is interpreted as entering the context of digital banking, which means e-loyalty is known as the behavior of users who use online banking applications repeatedly. This is because users are satisfied with the quality of service that has been felt before and are willing to recommend people around them to use the online service application . Mindy Jeon and Jeong (2019)	<ol style="list-style-type: none">1. Repurchase behavior2. Statement of being a loyal customer3. Spread positive information4. Resistant to persuasion5. Not Price Sensitive

3.3. Data Analysis Techniques

The analysis method in this study used testing with the PLS-SEM approach. The PLS-SEM tested used SmartPLS 4.0. *Smart Partial Least Square* (SmartPLS) software was used for data analysis, which includes the evaluation of measurement models (outside models), structural models (inner models), and hypothesis verification.

4. Result and discussion

4.1. Characteristics of Respondents

In this case, the demographics of the respondents in this study consisted of the respondent's age, gender, and profession. The description of the question is as follows:

Table 2. Respondent Characteristics

Gender	Number of Respondents	Percentage
Man	35	31%
Woman	78	69%
Total	113	100%
Respondent Age	Number of Respondents	Percentage
< 20 Years	7	6,2%
20 -30 Years	64	56,6%
31-40 Years	20	17,7%
41-50 Years	9	8%
> 50 Years	13	11,5%
Total	113	100%
Final Education	Number of Respondents	Percentage
High School/ Diploma	34	30.1%
Bachelor of Strata 1 (S1)	74	65,5%
Strata 2/S3	5	4.4%
Total	113	100%
Respondent's Profession	Number of Respondents	Percentage
Student/Student	6	5,3%
Private Employees	81	71,7%
Government Employees	1	0,9%
Self employed	4	3,5%
Housewives	13	11,5%
Other	8	7,1%
Total	113	100%

4.2. Data Analysis

4.2.1. Analysis of Measurement Models (Outer Model)

4.2.1.1. Convergent Validity

a) Average Variance Extracted (AVE)

According to Ghozali (2021), indicators in convergent validity are considered valid if they meet an AVE value above 0.5 or show a loading factor value of > 0.5 . A construct is responsible for more than 50% of the items included in the research model if the mean value of extracted variance (AVE) is greater than 0.5. Average Variance Extracted (AVE) describes the variance that can be explained by an item compared to the variance caused by measurement errors. Table 3 shows that showing that the AVE value for all variables is above 0.5 then the convergent validity is good

4.2.1.2. Discriminant Validity

Referring to this, discriminant validity in PLS can be studied through cross-loading between the indicator and its construct. In general, discriminant assessment has become a generally accepted condition for analyzing relationships with latent variables. In this case, to test the validity of discriminants, namely by looking at the value of cross-loading and HTMT.

a. Cross Loading

In this case, to test the validity of the discriminant, namely, by looking at the overall cross-loading value for each variable, the cross-loading value is expected to be above 0.70. The results of the statistical testing for cross-loading are as follows:

Table 3. Cross Loading Analysis

Indicators	E-Service Quality	E-Trust	E-Satisfaction	E-Loyalty
X1.2	0.754	0.516	0.379	0.374
X1.3	0.844	0.637	0.520	0.409
X1.4	0.800	0.582	0.416	0.349
X1.5	0.778	0.611	0.410	0.330
X1.6	0.837	0.684	0.521	0.437
X1.7	0.770	0.632	0.535	0.463
X1.8	0.766	0.639	0.524	0.480
X1.10	0.820	0.643	0.546	0.462
X1.11	0.748	0.625	0.628	0.441
X2.1	0.649	0.836	0.555	0.440
X2.2	0.747	0.861	0.528	0.381
X2.3	0.675	0.868	0.678	0.563
X2.4	0.689	0.877	0.673	0.543
X2.5	0.671	0.831	0.643	0.479
X2.6	0.657	0.881	0.691	0.574
X2.7	0.653	0.861	0.650	0.593
X2.8	0.660	0.821	0.623	0.520
Z1	0.511	0.636	0.762	0.688
Z2	0.459	0.517	0.713	0.607
Z3	0.492	0.548	0.776	0.671
Z4	0.587	0.632	0.818	0.622
Z5	0.553	0.662	0.848	0.646
Z6	0.504	0.510	0.808	0.650
Z7	0.504	0.546	0.861	0.656
Z8	0.500	0.585	0.784	0.695
Z9	0.488	0.581	0.787	0.660
Z10	0.480	0.658	0.768	0.612
Y1	0.485	0.549	0.706	0.766
Y2	0.509	0.570	0.747	0.827
Y3	0.453	0.517	0.731	0.855
Y4	0.316	0.362	0.586	0.793
Y5	0.434	0.47	0.633	0.842
Y6	0.367	0.424	0.597	0.779
Y7	0.304	0.383	0.570	0.772
Y9	0.432	0.501	0.610	0.773
Y10	0.498	0.544	0.691	0.796

Source: PLS Output (2025)

From the results in Table 3, it is known that for the overall results of the cross-loading test value, it is stated that the cross-loading value of each indicator, which totals 36 indicators, has a > value of 0.70, which means that it is greater than other dimensions or variables; thus, it can be concluded that the cross-loading test is valid.

b. Heterotrait-Monotrait Ratio (HTMT)

One way to test discriminant validity is the Heterotrait-Monotrait Ratio HTMT, where a high HTMT indicates a problem with discriminant validity. An HTMT value > 0.90 indicates the absence of discriminatory validity, while an HTMT < 0.90 is very good. Based on the results of statistical testing, the results are as follows:

Table 4. HTMT Analysis

Variable	E-Loyalty	E-Satisfaction	E-Service Quality	E-Trust
E-Loyalty				
E-Satisfaction	0.873			
E-Service Quality	0.558	0.675		
E-Trust	0.630	0.782	0.837	

Source: PLS Output (2025)

The HTMT discriminant validity of the results of Table 4 showed a value of < 0.90 , which means that four variables have good discriminant validity according to the test requirements.

4.2.1.3. Reliability

In this regard, the construct realism test is measured through two criteria: composite reliability and Cronbach's alpha value.

a. Cronbach Alpha

For the ideal Cronbach's alpha value, if it produces a value above 0.70. The ideal composite reliability value is if it produces a $>$ value of 0.70, which is considered to have met reliability (Ghozali, 2021). Based on the test results that can be seen in Table 4.10, it is stated that for the overall value for Cronbach's alpha > 0.70 , which means that the variable has good reliability. As for the E-Loyalty value, which is $0.930 > 0.70$, the E-Satisfaction value is $0.934 > 0.70$, the E-Service Quality value is $0.926 > 0.70$, and the E-Trust value is $0.947 > 0.70$.

b. Composite Reliability

Composite reliability is a test that measures a construct that can be evaluated in two different ways, namely, by looking at Cronbach's alpha value with internal consistency. The ideal composite reliability value is if it produces a $>$ value of 0.70, which is considered to have met the reliability (Ghozali, 2021). The results of the composite reliability test were as follows.

Table 5. Composite Reliability Analysis

Variable	Composite reliability	Composite reliability (rho_c)	Average Variance Extracted (AVE)	Cronbach's alpha
E-Loyalty	0.933	0.941	0,626	0.930
E-Satisfaction	0.935	0.944	0,730	0.934
E-Service Quality	0.929	0.938	0,630	0.926
E-Trust	0.951	0.956	0,642	0.947

Source: PLS Output (2025)

Based on the table above, which is 6, the values for the overall composite reliability (rho_a) and (rho_c) produce a reliable value in accordance with the test criteria, which is a $>$ value of 0.70. Therefore, it can be stated that the research construct has good reliability.

4.2.2. Structural Model Analysis (Inner Model)

a. R-Squares

If the value of R-Square is greater, the structural model or fit of the prediction model being tested is better. In this case, the change in the value of the R-Squares can be considered to explain the influence of exogenous latent variables on endogenous latent variables. Referring to this, the R-Squares values of 0.75, 0.50, and 0.25 provide an explanation that the model is strong, moderate, and weak. Based on data processing carried out using the smartPLS 4.0 program, the R-Square value was obtained as follows, as stated in the table. This is useful for predicting whether the model is good or bad.

Table 6. R-Squares Analysis

Variable	R-square	R-square adjusted
E-Loyalty	0.675	0.666
E-Satisfaction	0.561	0.553

Source: PLS Output (2025)

From the exposure of Table 7, it is proven that the R-squared value in the e-loyalty variable is 67.5%. Based on these results, it can be interpreted that the magnitude of the influence of the e-service quality and e-trust variables on e-satisfaction with e-loyalty proved by 67.5%, and the remaining 32.5% proved to be influenced by other variables outside the research model. Meanwhile, the R-squared value for the e-satisfaction variable was 56.1%. It can be said that the magnitude of the influence of e-service quality and e-trust on e-satisfaction is 56.1% and the remaining 43.9% is influenced by other variables. Thus, from Table 4.12, it can be seen that the overall result of the R-Square value has a moderate model.

b. Test Q² Predictive Relevance

With this technique, it is possible to represent the synthesis derived from cross-validation and fitting functions with predictions derived from the observed variables and the timing of the construct parameters. The Q² test was conducted to determine if the research model was valid and relevant. If the value of Q² > 0 indicates that the model has predictive relevance, meanwhile, the value of Q² < 0 indicates that the model lacks predictive relevance. (Setiaman, 2023). The results of the Q² values can consist of 0.02, 0.15 and 0.35 indicating that the model is weak, moderate/moderate, and strong. The test results are as follows:

Table 7. Q² Predictive Relevance Analysis

Variable	Q ² predict	RMSE	MAE
E-Loyalty	0.149	0.938	0.633
E-Satisfaction	0.307	0.846	0.479

Source: PLS Output (2025)

Based on the results of the test table above, it is known that the value for Q² for E-Loyalty results in a value of 0.149, and for E-Satisfaction results in a value of 0.307. The results of the test indicate that the research model has predictive relevance because the value is > 0; therefore, endogenous variables can be predicted by exogenous variables. The results of Q² also show that the model is in the moderate to strong range.

4.2.3. Hypothesis Testing

At this stage, it will use testing with a bootstrapping approach, namely by looking at the T-statistics or p-values of the model. It is known that the requirements in hypothesis testing can be explained if a hypothesis can be accepted or rejected by looking at the significance values of the T-statistics and p-values. The probability value provides the probability of an event occurring at a certain level of confidence (usually 95%; significance 0.05). The results of the statistical test are as follows:

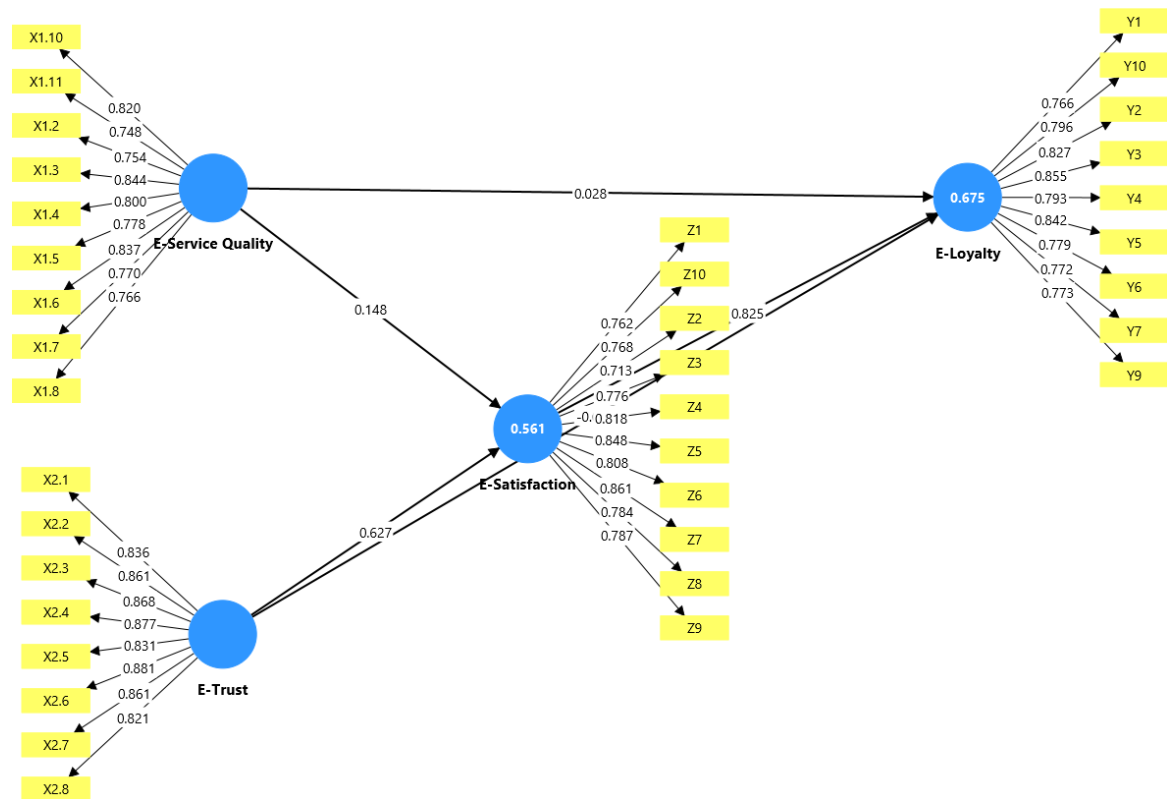


Figure 2. Bootstrapping Graphical Output
Source: PLS Output (2025)

4.2.3.1. Direct Effects

In studying and determining the hypothesis that results in direct influence, it refers to looking at the T-statistics value or p-values of the model. Therefore, the hypothesis can be declared acceptable if the T-Statistic value is greater than the T of table 1.96 (5%) and the P-Value must be less than 0.05. The results of the statistical tests were as follows:

Table 8. Direct Impact Analysis

Construct	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values	Result
E-Service Quality -> E-Loyalty	0.051	0.125	0.220	0.826	Not Accepted
E-Trust -> E-Loyalty	-0.022	0.117	0.245	0.806	Not Accepted
E-Service Quality -> E-Satisfaction	0.204	0.344	0.429	0.668	Not Accepted
E-Trust -> E-Satisfaction	0.590	0.252	2.493	0.013	Accepted
E-Satisfaction -> E-Loyalty	0.800	0.113	7.271	0.000	Accepted

4.2.3.2. Indirect Effects

In addition to analyzing the influence directly, the role of mediation was also tested to determine the position of the intervening variable, namely e-satisfaction in the model. This study uses mediation variables; therefore, an analysis of the indirect relationship between variables is needed. The indirect effect can be seen in the results of bootstrapping using an indirect effect with a statistical t-value of > 1.96 and a p-value of < 0.05 . The results of the mediation test are presented in Table 9.

Table 9. Indirect Influence Analysis

	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values	Hypothesis Test Results
E-Service Quality -> E-Satisfaction -> E-Loyalty	0.150	0.270	0.450	0.653	Rejected
E-Trust -> E-Satisfaction -> E-Loyalty	0.479	0.225	2.295	0.022	Accepted

Source: PLS Output (2025)

Based on the results of the statistical test listed in Table 9 in the indirect influence test, it can be stated that the results for the indirect influence of the variable e-service quality on e-loyalty through e-satisfaction obtained a T-Statistic value of $0.450 < 1.96$ and a P-Value value of $0.653 > 0.05$. This shows that e-service quality has no effect on e-loyalty, and it is known that there is no indirect influence of e-service quality on e-loyalty through e-satisfaction. Therefore, it can be concluded that the intervening variable, namely e-satisfaction, is not proven to be a mediating variable. Therefore, Hypothesis 6 is rejected.

Then, for the results of testing the indirect influence of the variable e-trust on e-loyalty through e-satisfaction, a T-Statistics value of $2.295 < 1.96$, and a resulting P-Value value of $0.022 > 0.05$, were obtained. From these results, it can be stated that e-trust has an effect on e-loyalty, and that there is an indirect influence of e-trust on e-loyalty through e-satisfaction. Thus, it can be concluded that e-satisfaction acts as a mediating variable between e-trust variables and e-loyalty. Therefore, Hypothesis 7 is accepted.

5. Conclusions ad Suggestions

5.1. Conclusion

Based on the results of the research described in the previous chapter, the following conclusions were drawn from this study:

1. E-Service Quality has a positive but insignificant effect on E-Loyalty.
2. E-trust did not have a positive and significant effect on loyalty.
3. E-Service Quality has a positive but not significant effect on E-Satisfaction.
4. E-trust has a positive and significant effect on e-satisfaction.
5. E-satisfaction had a positive and significant effect on loyalty.
6. E-service quality does not have an indirect effect on e-loyalty through e-satisfaction. Therefore, E-satisfaction is not able to mediate the relationship between e-service quality and e-loyalty.
7. E-Trust has an indirect effect on E-Loyalty through E-Satisfaction. Therefore, E-Satisfaction can mediate the relationship between e-trust and e-loyalty.

5.2. Suggestion

In accordance with the explanation stated in the results of this study, the following suggestions can be made:

1. Considering the substantial importance of the quality of electronic services to electronic loyalty, companies or service providers should prioritize investment in the quality of service from their online payment platforms with a focus on increasing the loyalty of their users
2. The company must be able to optimize the digital platform, namely QRIS periodically with routine maintenance of the platform, the services provided must consistently meet or even exceed the expectations of its users, and be able to provide periodic updates to minimize the digital risks of its users.
3. Companies should prioritize the development and maintenance of electronic trust and user satisfaction by implementing strong online security on the QRIS platform to minimize fraud, phishing, and digital crime, expected transparent communication to users, and ethical business practices, which are essential to foster and maintain electronic loyalty.
4. Further research is expected to be able to explore more from various perspectives. It is hoped that it can be studied in other industries, relevant variables to be researched, understand customer habits, and see digital developments and their progress.

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