

# 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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## Article History:

Received on 30 January 2025

1<sup>st</sup> Revision on 10 February 2025

Accepted on 15 February 2025

## 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-Loyalty, E-Satisfaction, E-Servqual, E-Trust, QRIS BCA*

**How to Cite:** Lorenza, B., Saparso, S. (2025). 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). *Journal of Multidisciplinary Academic and Practice Studies*, 3(1), 29-43.

## 1. Introduction

In Google research, Temasek released its latest report entitled "e-Conomy SEA 2024." According to the Temasek 2024 report, Southeast Asia's Internet economy is expected to increase by 13% from 2023 to 2024, with a projected growth CAGR of \$ 200-360 million by 2030. 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 was still often found, with a percentage of 51%. A slow network often resulted in disrupted payments, which was 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 provider 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 a crucial 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 look for alternatives, allowing competitors to take advantage of this situation (Hidayah & Utami, 2017).

Meanwhile, there are conflicting research results; based on other research by Ashiq and Hussain (2024), the mediation of electronic satisfaction on the effect of electronic service quality or electronic trust on electronic loyalty is not significant. 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. Other studies with similar results, namely that of So, Yang, and Li (2025), explain that e-service quality and e-trust have no effect on e-customer loyalty. Therefore, it can be concluded that e-satisfaction is not a mediating variable for these variables because e-customer loyalty in 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. The results of the 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 does 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. 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 recommend paying using QRIS (Khaitovna, 2025).

There are benefits to organizations if they can 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 sector, 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, 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 (Khomsin, Edris, & Utomo, 2023; 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 surpass their expectations. Meanwhile, another definition explains that e-customer satisfaction includes all experiences that customers obtain. 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 their wants and needs related to digital services. Customer satisfaction is related to trusted high-tech e-banking services, business performance, and customer intentions. When customers are satisfied, the impact is on business performance, which also increases, allowing the business to grow (Kaya, Behraves, Abubakar, Kaya, & Orús, 2019).

## **2.3. E-Service Quality**

Electronic service quality is the latest version of the commonly known service quality and can be interpreted as an adaptation and expansion of the service quality model that has been developed into an online ecosystem (Fang, Qu, & Wang, 2023). 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 measure of customer satisfaction with network services. 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 to provide services 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 services provided on the Internet (Arvianti, Mulyaningsih, Nughara, & Oktini, 2023).

## **2.4. E-Trust**

According to another opinion regarding online consumer trust, consumer expectations regarding the reliability and trust of a service provider in fulfilling its business commitments are stated. Thus, trust involves the willingness of consumers to make transactions online, which is based on positive expectations for consumer behavior in the future. Trust plays an important role in gaining customer loyalty and 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 in online sellers. *Electronic* trust describes several *customer expectations* regarding the trust and reliability of service providers in fulfilling the commitments

promised from the beginning (Arvianti et al., 2023; Yuliansyah, 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 to customers. It is also explained that *trust* involves the willingness of consumers to make *online* transactions in the hope of positive shopping behavior in the future. To strengthen consumer trust in online purchases, companies should build customer satisfaction through satisfactory and successful services to meet 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 *trust*. Thus, the research concept model is as follows.

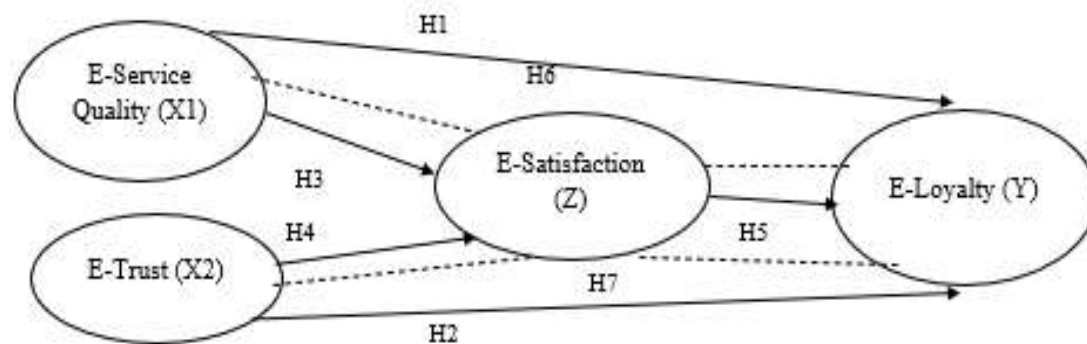


Figure 1. Research Concept Model

## 2.6. Hypothesis Development

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

This study starts from the problems or obstacles regarding the lack of success in the implementation of *QRIS BCA's e-service quality*, which states that there are a number of complaints or complaints related to the slow service of QRIS, slow service, irresponsibility, and so on. Thus, *BCA's e-service quality* needs to be improved to increase user loyalty. The loyalty of electronic customers during their journey is highly dependent on the quality of the 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; Salman, 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 are provided with electronic services of 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 studies, 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. The tests revealed 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 are emerging, such as security issues in using *BCA's QRIS*, which 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 influence customer loyalty. In line with this study, similarities were found 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 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. This indicates 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 customer service quality. 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. However, several obstacles or complaints are still 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, improving the quality of application e-services is important to overcome the problem of user dissatisfaction.

Based on the results of Melinda et al. 's (2023) research Melinda et al. (2023), *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 directly impacts satisfaction with the services provided by *mobile banking applications*. It stated 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 the users are to feel satisfied with it. showed 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 make repeat purchases and recommend it to others. Thus, companies can achieve high customer retention, increase customer loyalty, and even be able to achieve rapid long-term growth (Sari and Muna, 2024). However, several conditions still cause distrust among users, such as those experienced by some users when operating a *platform*. The obstacle is the delay of the bank in returning the balance that has been deducted in 2024 because the waiting time is approximately three weeks. Therefore, it is important to increase users' trust in *payment platforms*. The results of a 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 crucial because it directly impacts satisfaction with the services provided by *mobile banking applications*.

*Other similar studies* have reported similar results. The research studied by Mawardi, Tarwijo, Hanis, and Violin (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 recommending products or services to their friends and close relatives. Over time, customer satisfaction is believed to affect *e-loyalty* because it 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, risks to transaction security, and news that QRIS Tap cannot be used on iPhones (Budaya, 2023; Wulandari, Saladin, & Mulyani, 2024). Other

researchers have also shown 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. These results suggest that if more users are satisfied with the feeling of being happy with banking services, it should be easier to create user loyalty (Nisa & Hutagalung, 2022; 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*, such as 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 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 the applications. Online customer satisfaction mediates the relationship between service quality and customer loyalty. There is an indirect influence between *e-service quality* and *e-loyalty* through *e-satisfaction*; therefore, it can be concluded that *e-satisfaction* is significant as a mediator of the relationship between *e-service quality* and *e-loyalty*. It states that electronic satisfaction significantly mediates the influence of the quality of electronic services on *e-loyalty*. This makes customer satisfaction vital for 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 bank will be obliged to fully monitor the services it provides. Trust is the trust in the ability of a service provider to manage and provide services for a specific task. Service users expect that the services offered by employees are trustworthy. *E-trust* plays an important role in creating a *strong* level of *e-loyalty*.

Trust arises 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* via *e-customer satisfaction*. Providers should be committed to forming loyalty to consumers, and the company must create a sense of trust in providing satisfactory service. There is an indirect influence between *E-trust* and *E-loyalty* through *e-satisfaction*; thus, it can be concluded that *e-satisfaction* is significant as a mediator of the relationship between *E-trust* and *E-loyalty*. *E-trust* through *e-satisfaction* affects *e-loyalty*. These results show that 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

This study focuses on *E-Loyalty* and *its supporting variables*, namely *E-Service Quality*, *E-Trust*, and *E-Satisfaction*. Meanwhile, the subjects of the study are known to be active users of the BCA QRIS application in the Jakarta area. The population used in this study was QRIS BCA users 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 is unknown. 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 Ghazali 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 were *e-service quality* and *e-trust*. Meanwhile, for the dependent variable, namely, using *e-loyalty*, and for the intervening variable (Z), *e-satisfaction* was 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"> <li>1. Efficiency</li> <li>2. Fullfilment</li> <li>3. System Availability</li> <li>4. Privacy</li> <li>5. Compensation</li> <li>6. Contact</li> </ol>
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"> <li>1. Honest</li> <li>2. Dependability</li> <li>3. Competence</li> <li>4. Integrity</li> <li>5. Willingness to depend</li> </ol>
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"> <li>1. Convenience</li> <li>2. Merchandising</li> <li>3. Site Design</li> <li>4. Serviceability</li> <li>5. Security</li> </ol>
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"> <li>1. Repurchase behavior</li> <li>2. Statement of being a loyal customer</li> <li>3. Spread positive information</li> <li>4. Resistant to persuasion</li> <li>5. Not Price Sensitive</li> </ol>

### 3.3. Data Analysis Techniques

The analysis method used in this study was the PLS-SEM approach. PLS-SEM was performed using SmartPLS 4.0. *Smart Partial Least Squares* (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

The demographics of the respondents in this study consisted of their age, gender, and profession. The question was described 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%
<b>Final Education</b>	<b>Number of Respondents</b>	<b>Percentage</b>
High School/ Diploma	34	30.1%
Bachelor of Strata 1 (S1)	74	65,5%
Strata 2/S3	5	4.4%
Total	113	100%
<b>Respondent's Profession</b>	<b>Number of Respondents</b>	<b>Percentage</b>
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 Ghazali (2021), indicators of 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 the extracted variance (AVE) is greater than 0.5. The 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

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 method for analyzing relationships with latent variables. In this case, the validity of the discriminants was tested by examining 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
<b>X1.2</b>	<b>0.754</b>	0.516	0.379	0.374
<b>X1.3</b>	<b>0.844</b>	0.637	0.520	0.409
<b>X1.4</b>	<b>0.800</b>	0.582	0.416	0.349
<b>X1.5</b>	<b>0.778</b>	0.611	0.410	0.330
<b>X1.6</b>	<b>0.837</b>	0.684	0.521	0.437
<b>X1.7</b>	<b>0.770</b>	0.632	0.535	0.463
<b>X1.8</b>	<b>0.766</b>	0.639	0.524	0.480
<b>X1.10</b>	<b>0.820</b>	0.643	0.546	0.462
<b>X1.11</b>	<b>0.748</b>	0.625	0.628	0.441
<b>X2.1</b>	0.649	<b>0.836</b>	0.555	0.440
<b>X2.2</b>	0.747	<b>0.861</b>	0.528	0.381



<b>X2.3</b>	0.675	<b>0.868</b>	0.678	0.563
<b>X2.4</b>	0.689	<b>0.877</b>	0.673	0.543
<b>X2.5</b>	0.671	<b>0.831</b>	0.643	0.479
<b>X2.6</b>	0.657	<b>0.881</b>	0.691	0.574
<b>X2.7</b>	0.653	<b>0.861</b>	0.650	0.593
<b>X2.8</b>	0.660	<b>0.821</b>	0.623	0.520
<b>Z1</b>	0.511	0.636	<b>0.762</b>	0.688
<b>Z2</b>	0.459	0.517	<b>0.713</b>	0.607
<b>Z3</b>	0.492	0.548	<b>0.776</b>	0.671
<b>Z4</b>	0.587	0.632	<b>0.818</b>	0.622
<b>Z5</b>	0.553	0.662	<b>0.848</b>	0.646
<b>Z6</b>	0.504	0.510	<b>0.808</b>	0.650
<b>Z7</b>	0.504	0.546	<b>0.861</b>	0.656
<b>Z8</b>	0.500	0.585	<b>0.784</b>	0.695
<b>Z9</b>	0.488	0.581	<b>0.787</b>	0.660
<b>Z10</b>	0.480	0.658	<b>0.768</b>	0.612
<b>Y1</b>	0.485	0.549	0.706	<b>0.766</b>
<b>Y2</b>	0.509	0.570	0.747	<b>0.827</b>
<b>Y3</b>	0.453	0.517	0.731	<b>0.855</b>
<b>Y4</b>	0.316	0.362	0.586	<b>0.793</b>
<b>Y5</b>	0.434	0.47	0.633	<b>0.842</b>
<b>Y6</b>	0.367	0.424	0.597	<b>0.779</b>
<b>Y7</b>	0.304	0.383	0.570	<b>0.772</b>
<b>Y9</b>	0.432	0.501	0.610	<b>0.773</b>
<b>Y10</b>	0.498	0.544	0.691	<b>0.796</b>

Source: PLS Output (2025)

The results in Table 3 show that for the overall results of the cross-loading test value, the cross-loading value of each indicator, which totals 36 indicators, has a value of  $> 0.70$ , which 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, whereas an HTMT  $< 0.90$  is very good. Based on the results of the statistical testing, the results are as follows:

Table 4. HTMT Analysis

Variable	E-Loyalty	E-Satisfaction	E-Service Quality	E-Trust
<b>E-Loyalty</b>				
<b>E-Satisfaction</b>	<b>0.873</b>			
<b>E-Service Quality</b>	<b>0.558</b>	<b>0.675</b>		
<b>E-Trust</b>	<b>0.630</b>	<b>0.782</b>	<b>0.837</b>	

Source: PLS Output (2025)

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

#### 4.2.1.3. Reliability

In this regard, the construct realism test was measured using 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. 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 are 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 a 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. Accordingly, R-squared values of 0.75, 0.50, and 0.25 indicate that the model is strong, moderate, and weak, respectively, respectively. Based on data processing carried out using the SmartPLS 4.0 program, the R-squared value was obtained as follows, as stated in (table. This is useful for predicting whether the model is good or poor.

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)

As shown in Table 7, 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 was 67.5%, and the remaining 32.5% was influenced by other variables outside the research model. The R-squared value for e-satisfaction 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-squared value has a moderate model.

##### b. Test Q<sup>2</sup> 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 timing of the construct parameters. The Q2 test was conducted to determine whether the research model was valid and relevant. A Q2 value  $> 0$  indicates that the model has predictive relevance, whereas a Q2 value  $< 0$  indicates that the model lacks predictive relevance. (Setiawan 2023). The Q2 values were 0.02, 0.15, and 0.35, indicating that the model was weak, moderate/moderate, and strong. The test results are as follows.

Table 7. Q2 Predictive Relevance Analysis

Variable	Q <sup>2</sup> 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, testing is performed using 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 examining 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 of 0.05). The results of the statistical tests are as follows:

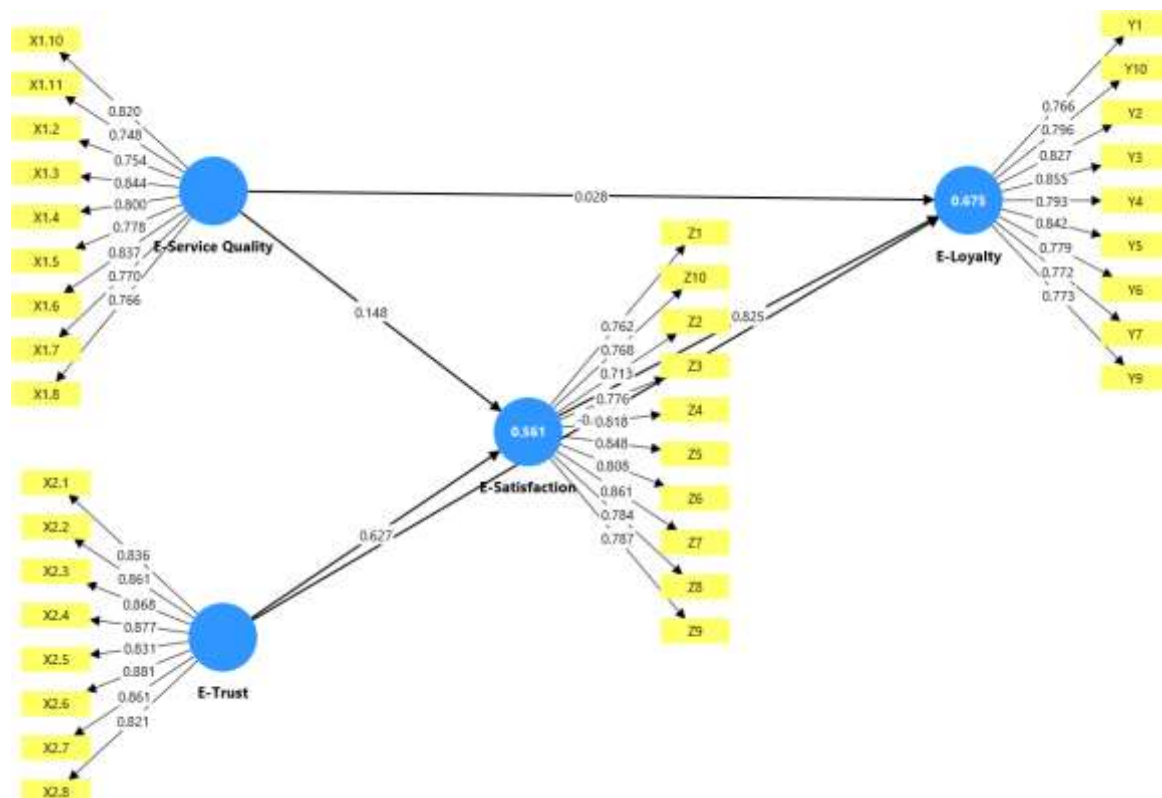


Figure 2. Bootstrapping Graphical Output  
Source: PLS Output (2025)

#### 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 is 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	<b>2.493</b>	<b>0.013</b>	<b>Accepted</b>
E-Satisfaction -> E-Loyalty	0.800	0.113	<b>7.271</b>	<b>0.000</b>	<b>Accepted</b>

#### 4.2.3.2. Indirect Effects

In addition to directly analyzing the influence, 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 required. 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 shown 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	<b>2.295</b>	<b>0.022</b>	<b>Accepted</b>

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 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.

The results of testing the indirect influence of the variable e-trust on e-loyalty through e-satisfaction showed a T-statistics value of  $2.295 < 1.96$ , and a resulting P-value of  $0.022 > 0.05$ . These results indicate that e-trust affects 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 and e-loyalty. Therefore, Hypothesis 7 is accepted.

## 5. Conclusion

### 5.1. Conclusion

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

1. E-Service Quality has a positive but insignificant effect on ELoyalty.
2. E-trust did not have a positive or significant effect on loyalty.
3. E-Service Quality has a positive but not significant effect on e-satisfaction.
4. E-trust positively and significantly affects e-satisfaction.
5. E-satisfaction positively and significantly affected loyalty.
6. E-service quality does not indirectly affect e-loyalty through e-satisfaction. Therefore, E-satisfaction cannot 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. Companies 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, ensure transparent communication to users, and engage in ethical business practices, which are essential to foster and maintain electronic loyalty.
4. Further research is expected to explore more perspectives. It is hoped that this study can be extended to other industries, relevant variables can be researched, customer habits can be understood, and digital developments and their progress can be observed.

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