THE EFFECT OF BRAND IMAGE AND PERCEIVED SECURITY ON QRIS USER LOYALTY IN THE DANA E-WALLET THROUGH PERCEIVED RISK AS AN INTERVENING VARIABLE (CASE STUDY OF STUDENTS AT UNIVERSITAS MUHAMMADIYAH PONTIANAK)

Daffa Avila Aprilian[1]
Universitas Muhammadiyah Pontianak, Pontianak, Indonesia
daffaavila455@gmail.com

Fenni Supriadi[2]
Universitas Muhammadiyah Pontianak, Pontianak, Indonesia
fennisupriadi@unmuhpnk.ac.id

Abstract

This study aims to analyze the effect of Brand Image and Perceived Security on QRIS User Loyalty with Perceived Risk as an intervening variable among students of Universitas Muhammadiyah Pontianak. The study uses a quantitative approach with an associative design. The research population is students of Universitas Muhammadiyah Pontianak who use QRIS on the Dana e-wallet, with a sample of 100 respondents determined through purposive sampling according to the criteria of Dana usage and the intensity of QRIS transactions. Primary data were collected through questionnaires, while secondary data were sourced from official publications related to QRIS development. Data analysis used PLS-SEM with SmartPLS through evaluation of the outer model (convergent validity, discriminant validity, AVE, and reliability) and the inner model (R-square, F-square, and SRMR), accompanied by hypothesis testing through direct effect and indirect effect (bootstrapping). The results show that all constructs meet the validity and reliability criteria. The model has a good fit with SRMR = 0.064 and the model's explanatory ability is in the moderate category (R^2 loyalty = 0.639; R^2 perceived risk = 0.564). Structurally, Brand Image has a significant positive effect on Loyalty (t = 4.280; p = 0.000), while Perceived Security is not significant on Loyalty (p = 0.183). Perceived Risk has a significant negative effect on Loyalty (t = 2.246; p = 0.025), but Brand Image and Perceived Security are not significant on Perceived Risk. In addition, Perceived Risk does not mediate the effect of Brand Image or Perceived Security on QRIS user loyalty.

Keywords: Brand Image, Perceived Security, User Loyalty, QRIS, Perceived Risk

INTRODUCTION

The development of digital payment systems in Indonesia has shown consistent growth along with the transformation of a technology-based economy. Transaction digitalization has driven a shift from cash usage to electronic payment systems that emphasize efficiency, speed, and interoperability. In this context, Bank Indonesia together with the Indonesian Payment System Association (ASPI) developed the Quick Response Code Indonesian Standard (QRIS) as a national standard for QR Code-based payments. Since being officially launched in 2019, QRIS has recorded significant growth in terms of transaction volume and value, which in the first quarter of 2025 increased by 169% and 148%, respectively, compared to the same period in the previous year (ASPI, 2025).

This growth is also reflected in the expansion of the QRIS ecosystem nationally, both in terms of the number of providers and users. As of April 2025, a total of 143 institutions were registered as QRIS providers, dominated by the banking sector with 87 institutions. On the user side, the number of QRIS users increased from 18 million in 2022 to 56.3 million in March 2025, although the growth rate began to slow after 2024, indicating that QRIS has entered a maturity phase of usage in Indonesia (ASPI, 2025). This condition shows that increasing adoption no longer depends solely on the expansion of new users, but also on usage patterns and established user behavior.

At the regional level, West Kalimantan Province shows a QRIS adoption pattern in line with the national trend. Bank Indonesia data show that the number of QRIS users in West Kalimantan increased from 349,582 users in 2022 to 648,535 users in 2023, or grew by 85.6%, then increased to 716,677 users in 2024 with a growth rate of 10.5% (Bank Indonesia, 2025). This increase occurred along with the strengthening of digital infrastructure and the intensification of non-cash payment system socialization in the region.

In addition to the increase in the number of users, the shift in payment behavior of the people of West Kalimantan is also reflected in the development of transaction value. During the 2022–2024 period, both cash and non-cash transactions increased, but the growth rate of non-cash transactions was recorded higher than cash transactions (Bank Indonesia, 2025). This phenomenon shows a change in people's preferences toward digital payment systems, especially QRIS, which is increasingly used in daily economic activities.

On the other hand, although QRIS on the Dana e-wallet shows a high level of adoption, there are still indications of psychological factors influencing user behavior, particularly related to perceived security and perceived risk in digital transactions. Concerns regarding potential personal data leakage, fraud, and system disruptions still arise amid increasing QRIS usage, including among students as active users of digital payment services. This condition indicates an empirical gap between usage intensity and user loyalty that cannot yet be fully explained by adoption data alone.

Based on the phenomenon of increasing QRIS usage as a digital payment instrument among students, especially on the Dana e-wallet, user loyalty becomes a strategic issue that needs to be studied more deeply. Loyalty is not only determined by ease and intensity of use, but is also influenced by psychological factors in the form of perceptions of the brand and transaction system security. Indrasari (2019) states that brand image reflects consumers' perceptions of the quality and characteristics attached to a brand. Several previous studies have proven direct relationships among variables, including Nurhidayah, Yuliniar, and Pangestuti (2021) who found that brand image has a positive and significant effect on e-wallet user loyalty, and Dewi (2021) who showed that perceived security has a positive and

significant effect on customer loyalty. In addition, Nurfadillah (2025) revealed that perceived risk affects Dana e-wallet user loyalty.

Previous research generally still places perceived risk as an independent variable that stands alone, so its role as a psychological mechanism that bridges the influence of brand image and perceived security on user loyalty has not been studied comprehensively. In addition, empirical studies on QRIS usage on the Dana e-wallet among students, especially in regions with high QRIS growth such as Pontianak City, are still limited. Therefore, this study was conducted to fill this gap by analyzing the effect of brand image and perceived security on QRIS user loyalty on the Dana e-wallet through perceived risk as an intervening variable, focusing on students of Universitas Muhammadiyah Pontianak.

In line with these problems, the purpose of this study is to analyze the effect of brand image and perceived security on QRIS user loyalty through perceived risk as an intervening variable among students of Universitas Muhammadiyah Pontianak.

REVIEW OF LITERATURE

Brand Image (X1)

Brand image is defined as a perception formed in the consumer's mind when recalling a brand of a particular product or service (Firmansyah, 2019). This perception represents a set of associations attached to the brand and is formed through experience, information, and consumer interaction with the company. Indrasari (2019) explains that brand image relates to consumers' perceptions of the quality and characteristics associated with a brand or company.

Biel (1992) in Firmansyah (2019) stated that brand image consists of three main components, namely corporate image, user image, and product image. Corporate image refers to a set of associations perceived by consumers about the company that produces the product or provides the service. User image describes consumers' perceptions of the parties who use the product or service, including lifestyle, personality, and the user's social status. Product image reflects consumers' associations with the product itself, which includes product attributes, perceived benefits, the way it is used, and guarantees attached to the product (Firmansyah, 2019). Nurhidayah et al. (2021) shows that brand image has a positive and significant effect on customer loyalty in e-wallet usage.

Perceived Security (X2)

Perceived security is defined as consumers' perception of the ability of a digital system or platform to protect personal information and financial transaction data during interactions between consumers and service providers (Sawlani, 2021). This perception is formed from users' subjective belief regarding system security in preventing access, storage, or manipulation of data by unauthorized parties. Flavián and Guinalíu (2006) explain that perceived security is the subjective probability by which consumers believe that personal information, both private and financial, will not be misused during the transmission and storage process, and will be managed according to users' trust expectations. This definition emphasizes the dimension of user confidence in digital system security mechanisms.

Indicators of perceived security refer to two main aspects, namely security assurance and data confidentiality (Raman & Viswanathan, 2011 in Sawlani, 2021). Security assurance relates to consumers' perceptions of system protection in reducing the risk of misuse of personal data and transactions. Data confidentiality refers to the protection of consumer information so that it does not fall into other parties' hands that could cause losses for the

data owner. Empirically, Dewi (2021) found that perceived security has a positive and significant effect on customer loyalty in e-wallet usage. These findings indicate a linkage between security perceptions and user loyalty in the context of digital payment services.

Perceived Risk (Z)

Perceived risk is defined as the uncertainty perceived by individuals regarding the possibility of adverse consequences accompanying the use or purchase of a product or service (Dowling, 1994 in Kusuma & Wijana, 2025). Perceived risk reflects consumers' subjective assessment of potential losses that may arise during service usage. Featherman and Pavlou (2003) explain that perceived risk relates to uncertainty about the possibility of negative consequences from the use of an electronic service, including potential losses in the effort to achieve the expected outcomes. In the context of digital services, risk is perceived as a psychological barrier that influences user behavior.

Ibrahim (2014) in Kusuma and Wijana (2025) identifies five main dimensions in measuring perceived risk in the online context, namely perceived financial risk, perceived performance risk, perceived time loss risk, perceived psychological risk, and perceived source risk. These five dimensions are used to describe forms of potential losses perceived by consumers when using digital services. Nurfadillah (2025) shows that perceived risk affects Dana e-wallet user loyalty.

User Loyalty (Y)

Customer loyalty is defined as a strong commitment from customers to repurchase the same product or service consistently over a certain period (Griffin, 2015). Loyalty reflects behavioral and attitudinal attachment of customers to a brand or service. Halim (2021) states that customer loyalty is a high commitment to repurchase in the future, despite situational influences or marketing efforts that may encourage switching behavior. This definition places loyalty as a form of sustainable attachment between customers and service providers.

Indicators of customer loyalty refer to three aspects, namely the tendency to conduct word of mouth communication continuously, the absence of a desire to switch to competitors, and the tendency to buy more products from the same company (Zeithaml, 2000 in Halim, 2021). These three indicators are used to measure user loyalty in the context of using QRIS-based e-wallet services.

RESEARCH METHOD

This study uses an associative type of research to analyze the relationship between two or more variables (Sugiyono, 2019). This design is used to test the effect of Brand Image (X1) and Perceived Security (X2) on QRIS User Loyalty (Y) on the Dana e-wallet, with Perceived Risk (Z) as an intervening variable among students of Universitas Muhammadiyah Pontianak. Data collection in this study was carried out through primary data and secondary data. Primary data were obtained directly from respondents through the distribution of questionnaires (Siregar, 2020); in this study the questionnaire was distributed directly to students of Universitas Muhammadiyah Pontianak who use QRIS to obtain information regarding respondents' attitudes and behavior. Meanwhile, secondary data were used as supporting data sourced from official publications, including the volume and nominal value of QRIS transactions in Indonesia in 2022–2025, the number of QRIS providers and users in Indonesia in 2022–2025, as well as cash and non-cash transaction data in West Kalimantan in 2022–2024.

The sampling technique used was purposive sampling, namely determining the sample based on certain criteria (Sujarweni, 2019). Respondents in this study were students over 18 years old who have an active Dana account, use QRIS for daily transactions, and have made transactions using QRIS on the Dana e-wallet more than three times in the last three months and are willing to fill out the questionnaire honestly and completely. The research variables consist of Brand Image and Perceived Security as independent variables, QRIS User Loyalty as the dependent variable, and Perceived Risk as the intervening variable. Variable measurement was carried out using a five-point Likert scale to measure respondents' attitudes, opinions, and perceptions regarding social phenomena (Sugiyono, 2019).

Data analysis used the Partial Least Square–Structural Equation Modeling (PLS-SEM) approach with the help of the SmartPLS application, which combines structural analysis, factor analysis, and path analysis (Musyaffi et al., 2021). Model evaluation was carried out through testing the outer model and inner model to assess validity, reliability, and the feasibility of the structural model. Hypothesis testing was conducted through analysis of direct effects and indirect effects with decision-making criteria based on P-Values, where a value less than 0.05 is declared significant and a value greater than 0.05 is declared not significant (Juliandi, 2018).

RESULTS AND DISCUSSION

Outer Model

a. Convergent Validity Test

Convergent validity testing is carried out by assessing the loading factor value of each indicator on the latent construct. An indicator is declared to meet convergent validity if it has a loading factor value above 0.7, which indicates a strong relationship and the indicator's ability to represent the research construct. The results of the convergent validity test for all research variables are presented in Table 1.

Table 1. Convergent Validity Test Results

Variable	Indicator	Loading Factor	Description
Brand Image (X1)	X1.1	0.801	Valid
	X1.2	0.770	
	X1.3	0.766	
	X1.4	0.816	
	X1.5	0.819	
	X1.6	0.818	
	X1.7	0.811	
	X1.8	0.842	
	X1.9	0.823	
Perceived Security (X2)	X2.1	0.801	Valid
	X2.2	0.755	
	X2.3	0.738	
	X2.4	0.840	
	X2.5	0.746	
	X2.6	0.748	
	Z.1	0.811	
	Z.2	0.730	

Perceived Risk (Z)	Z.3	0.773	Valid
	Z.4	0.764	
	Z.5	0.865	
	Z.6	0.746	
	Z.7	0.823	
	Z.8	0.781	
	Z.9	0.845	
	Z.10	0.801	
	Z.11	0.826	
	Z.12	0.824	
	Z.13	0.833	
	Z.14	0.839	
	Z.15	0.741	
User Loyalty (Y)	Y.1	0.790	Valid
	Y.2	0.785	
	Y.3	0.834	
	Y.4	0.838	
	Y.5	0.830	
	Y.6	0.809	
	Y.7	0.835	

Source: Processed Data, 2026

Based on Table 1, the results of the convergent validity test show that all indicators for the variables Brand Image (X1), Perceived Security (X2), Perceived Risk (Z), and User Loyalty (Y) obtained loading factor values above 0.7, thus all indicators are declared valid and able to represent each construct well.

b. Discriminant Validity

The next step is to test discriminant validity. Discriminant validity testing is performed using the Fornell–Larcker criterion by comparing the value of a construct with its correlation with other constructs. A construct is declared to meet discriminant validity if its value is greater than the correlation between constructs, indicating that the indicators better represent the construct being measured. The results of the discriminant validity test are presented in Table 2.

Table 2. Discriminant Validity Test Results

Variable	Brand Image	User Loyalty	Perceived Risk	Perceived Security
Brand Image	0.808			
User Loyalty	0.491	0.817		
Perceived Risk	0.595	0.784	0.801	
Perceived Security	0.708	0.684	0.745	0.772

Source: Processed Data, 2026

Based on the results of the discriminant validity test in Table 2, all constructs have Fornell–Larcker values greater than their correlations with other constructs, so the indicators are considered to better represent the construct being measured. Thus, all constructs are declared to meet discriminant validity because the Fornell–Larcker value exceeds 0.70.

c. Average Variance Extracted (AVE)

Furthermore, construct validity is also tested through the Average Variance Extracted (AVE) value, where a construct is declared valid if it has an AVE value greater than 0.5. The AVE values in this study are presented in Table 3.

Table 3. AVE Test Results

CONSTRUCT	*AVE*
Brand Image (X1)	0.652
Perceived Security (X2)	0.596
Perceived Risk (Z)	0.642
User Loyalty (Y)	0.668

Source: Processed Data, 2026

Based on Table 3, it is known that all variables obtained AVE values above 0.5, thus all constructs are declared to have met discriminant validity and the indicators used are valid in measuring the research variables.

d. Reliability Test

The reliability test aims to assess the consistency of the research instrument through evaluation of the outer model by using Composite Reliability and Cronbach's Alpha. A construct is declared reliable if the Composite Reliability value is more than 0.7 and Cronbach's Alpha is at least 0.6. The results of the reliability test in this study are presented in Table 4.

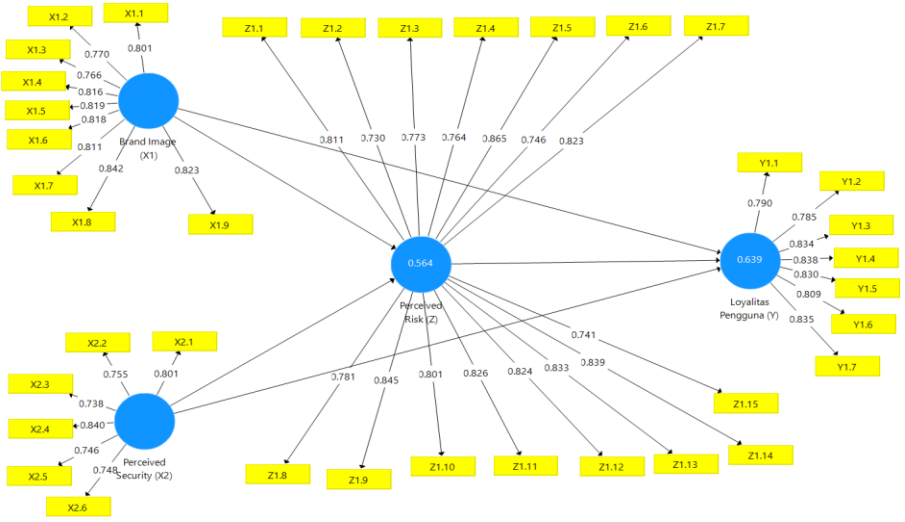
Table 4. Reliability Test Results

Variable	Cronbach's Alpha	Composite Reliability
Brand Image (X1)	0.933	0.944
Perceived Security (X2)	0.864	0.898
Perceived Risk (Z)	0.960	0.964
User Loyalty (Y)	0.917	0.934

Source: Processed Data, 2026

Based on the reliability test results in Table 4.9, all constructs meet the reliability criteria with Composite Reliability values above 0.7 and Cronbach's Alpha above 0.6. This indicates that the indicators in each variable have good consistency and are feasible to use. The results of the Outer Model testing are presented in Figure 1.

Figure 1. Outer Model Testing Results



Source: Output SmartPLS, 2026

Inner Model

a. Koefisien Determinasi (R-Square test)

In SEM-PLS, the R-square (R^2) value is used to assess the ability of independent variables to explain the variation of the dependent variable. The larger the R^2 value, the better the explanatory power and predictive ability of the model for the dependent variable. The R^2 value ranges from 0–1 with criteria of 0.67 (strong), 0.33 (moderate), and 0.19 (weak). The results of the R-square calculation are presented in Table 5.

Table 5. R-Square Test Results

Endogen Variable	R-Square	R-Square Adjusted
Perceived Risk (Z)	0.564	0.555
User Loyalty (Y)	0.639	0.628

Source: Processed Data, 2026

Based on the R-Square test results in Table 5, several findings were obtained as follows.

1) The R-Square Adjusted value for the Perceived Risk (Z) variable of 0.555 indicates that Brand Image (X1) and Perceived Security (X2) simultaneously are able to explain 55.5% of the variation in Perceived Risk, while 44.5% is influenced by other factors outside the model. The Adjusted R-Square value of 0.564 indicates that the influence of Brand Image and Perceived Security on Perceived Risk is in the moderate category.
2) Nilai The R-Square value for the User Loyalty (Y) variable of 0.628 indicates that Brand Image (X1), Perceived Security (X2), and Perceived Risk (Z) together are able to explain 62.8% of the variation in User Loyalty, while the remaining 37.2% is influenced by other factors outside the research model. The Adjusted R-Square value of 0.639 indicates that the contribution of the three constructs to User Loyalty is in the moderate category.

b. F Square Test

In SEM-PLS analysis, the F-Square Test is used to measure the effect size of an independent construct on the dependent construct in the structural model. The F-Square values from the calculation results can be seen in Table 6.

Table 6. -Square Test Results

Model	F Square
Brand Image (X1) ─> User Loyalty (Y)	0.007
Perceived Security (X2) ─> User Loyalty (Y)	0.067
Perceived Risk (Z) ─> User Loyalty (Y)	0.475

Source: Processed Data, 2026

Based on the F-Square test results in Table 6, the results can be interpreted as follows:

1) The F-Square value in the model of Brand Image (X1) on User Loyalty (Y) obtained a value of 0.007, classified as low, because the value is below the 0.02 interval.
2) The F-Square value in the model of Perceived Security (X2) on User Loyalty (Y) has a value of 0.067, classified as low, because the value is in the 0.02 interval.
3) The F-Square value in the model of Perceived Risk (Z) on User Loyalty (Y) has a value of 0.475, classified as very strong, because the value is in the interval above 0.35.

c. Goodness of Fit (GoF)

Goodness of Fit (GoF) testing in SEM-PLS is conducted to assess the overall fit of the model in the inner model and outer model. The level of model fit is evaluated using the

SRMR (Standardized Root Mean Square Residual) indicator, where a lower value indicates a better model fit. The results of the GoF calculation are presented in Table 7.

Table 7. Goodness of Fit Test Results

	Model Estimasi
SRMR	0,064

Source: Processed Data, 2026

Based on the GoF test results in Table 7, the SRMR value of 0.064 is below the 0.08 threshold, which indicates that the model has a very good level of fit and is able to represent the research data optimally.

d. Direct Effect

Direct effect is used to test the direct influence of exogenous latent variables on endogenous latent variables based on the bootstrapping path coefficient. The results of the direct effect test in this study are presented in Table 8.

Table 8. Result of Direct Effect

Hypotheses	Relationship Between Variables	Original Sample Estimate	T Statistic	P Value	Description
H1	Brand Image ─> Perceived Risk	-0.038	0.114	0.909	Rejected
H2	Perceived Security ─> Perceived Risk	-0.339	1.081	0.280	Rejected
H3	Perceived Risk ─> User Loyalty	-0.131	2.246	0.025	Accepted
H4	Brand Image ─> User Loyalty	0.680	4.280	0.000	Accepted
H5	Perceived Security ─> User Loyalty	0.237	1.335	0.183	Rejected

Source: Processed Data, 2026

Based on the results of direct hypothesis testing shown in Table 8, the direct effect results can be explained as follows:

1) The test result of the direct relationship between Brand Image (X1) and Perceived Risk (Z) shows a T-statistic value of 0.114, which is below the critical limit of 1.96, and a P-Value of 0.909 which exceeds the 0.05 significance level. Based on these findings, it can be concluded that Brand Image does not have a significant direct effect on Perceived Risk.
2) The test result of the direct relationship between Perceived Security (X2) and Perceived Risk (Z) shows a T-statistic value of 1.081, which is below the critical limit of 1.96, and a P-Value of 0.280 which exceeds the 0.05 significance level. Based on these findings, it can be concluded that Perceived Security does not have a significant direct effect on Perceived Risk.
3) The test result of the direct relationship between Perceived Risk (Z) and User Loyalty (Y) shows a T-statistic value of 2.246, which is above the critical limit of 1.96, and a P-Value of 0.025 which is below the 0.05 significance level. Based on these findings, it can be concluded that Perceived Risk has a significant negative effect on User Loyalty.
4) The test result of the direct relationship between Brand Image (X1) and User Loyalty (Y) shows a T-statistic value of 4.280, which is above the critical limit of 1.96, and a P-Value of 0.000 which is below the 0.05 significance level. Based on these findings, it can be concluded that Brand Image has a significant positive effect on User Loyalty.
5) The test result of the direct relationship between Perceived Security (X2) and User Loyalty (Y) shows a T-statistic value of 1.335, which is below the critical limit of 1.96, and a P-Value of 0.183 which exceeds the 0.05 significance level. Based on these

findings, it can be concluded that Perceived Security does not have a significant direct effect on User Loyalty.

e. Indirect Effect

Indirect effect is used to test the indirect influence of exogenous latent variables on endogenous latent variables through the mediating variable based on bootstrapping results. The results of the indirect effect test in this study are presented in Table 9.

Table 9. Result of Indirect Effect

Hypotheses	Relationship Between Variables	Original Sample Estimate	T Statistic	P Value	Description
H6	Brand Image —> Perceived Risk —> User Loyalty	0.005	0.111	0.911	Rejected
H7	Perceived Security —> Perceived Risk —> User Loyalty	0.044	0.930	0.353	Rejected

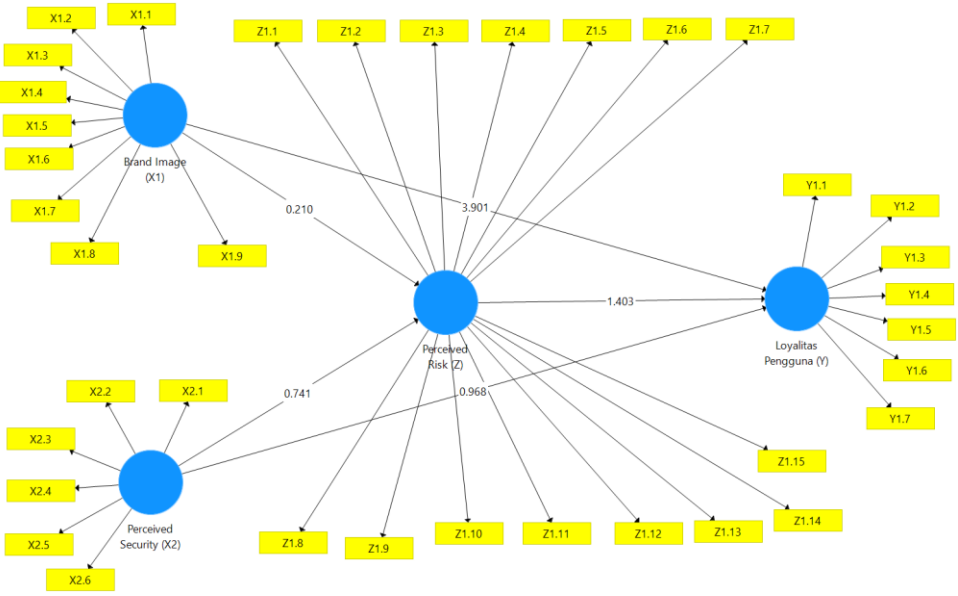
Source: Processed Data, 2026

Based on the indirect effect test results in Table 9, several findings were obtained as follows.

1) Brand Image (X1) does not have a significant effect on User Loyalty (Y) through Perceived Risk (Z), as indicated by a T-statistic value of 0.111 (< 1.96) and a P-Value of 0.911 (> 0.05). Thus, Perceived Risk does not mediate the effect of Brand Image on User Loyalty.
2) Perceived Security (X2) also does not have a significant effect on User Loyalty (Y) through Perceived Risk (Z), with a T-statistic value of 0.930 (< 1.96) and a P-Value of 0.353 (> 0.05). This shows that Perceived Risk does not act as a mediating variable in the relationship.

The Inner Model testing results in this study can be seen in Figure 2.

Figure 2. Inner Model Testing Results



Source: Output SmartPLS, 2026

DISCUSSION

a. The Effect of Brand Image (X1) on Perceived Risk (Z)

The direct effect test results show that Brand Image does not have a significant effect on Perceived Risk. This is indicated by a T-statistic value of 0.114 which is below the threshold of 1.96 and a P-Value of 0.909 which exceeds 0.05. These findings indicate that the brand image of Dana does not directly affect the risk perception felt by users in using QRIS. Conceptually, these results show that although brand image can shape loyalty, brand image does not automatically reduce or increase users' perceived risk. In the context of students as digital users who are relatively technologically literate, QRIS transaction risk is perceived more as a systemic risk inherent in digital payment technology in general, rather than as an attribute of a particular brand. Thus, brand image functions as an affective and evaluative driver of loyalty, but is not strong enough to change users' perceived risk directly.

b. The Effect of Perceived Security (X2) on Perceived Risk (Z)

The test results show that perceived security does not have a significant effect on perceived risk, as indicated by a T-statistic value of 1.081 (< 1.96) and a P-Value of 0.280 (> 0.05). These findings indicate that security perceptions do not directly shape the perceived risk of QRIS users on the Dana e-wallet. Students tend to regard the security of digital payment systems as a baseline expectation, so perceived risk is more influenced by other factors such as system disruptions or previous transaction experiences. Almaiah et al. (2023) position perceived security and perceived risk as constructs that work in parallel in influencing user trust and attitudes, without a direct causal relationship. These findings are also in line with Wong and Mo (2019) in the context of mobile payment. Thus, the non-significant effect of perceived security on perceived risk indicates that their relationship is contextual and influenced by user characteristics and the maturity of the digital payment system, especially among student groups who are accustomed to the QRIS-based digital payment ecosystem.

c. The Effect of Perceived Risk (Z) on QRIS User Loyalty (Y)

The test results show that perceived risk has a negative and significant effect on QRIS user loyalty. This is indicated by a T-statistic value of 2.246 which exceeds the critical limit of 1.96 and a P-Value of 0.025 which is below the 0.05 significance level. The negative direction of the effect indicates that the higher the risk perceived by users, the lower the level of loyalty in using QRIS. These findings are in line with the research of Wiratama et al. (2026) which found that perceived risk has a negative and significant effect on customer loyalty in the LinkAja application, where a decrease in the level of risk perceived by users can increase loyalty sustainably. These findings are also consistent with Esmaeili et al. (2021) which shows that perceived risk has a negative impact on customer loyalty in mobile banking services. The similarity of these results confirms that perceived risk, whether in the form of financial risk, performance risk, or psychological risk, is a major inhibiting factor in the formation of loyalty in digital payment services. Such risks have the potential to reduce users' sense of security, comfort, and trust, thereby weakening long-term usage intention. Thus, although in some studies perceived risk has not always been positioned as a mediating variable, the results of this study strengthen its role as an important determinant that directly affects QRIS user loyalty in the digital payment ecosystem.

d. The Effect of Brand Image (X1) on QRIS User Loyalty (Y)

The direct effect test results show that Brand Image has a positive and significant effect on QRIS User Loyalty. This is proven by a T-statistic value of 4.280 which exceeds

the critical limit of 1.96 and a P-Value of 0.000 which is below the 0.05 significance level. These findings indicate that the more positive the brand image of the Dana e-wallet in the minds of users, the higher the level of user loyalty in using QRIS sustainably. The study by Febriani et al (2022) also shows that brand image has a significant effect on customer loyalty. A strong brand image creates perceptions of quality, reliability, and value, thereby encouraging long-term user commitment. The findings of this study also support the results of the study conducted by Nurhidayah et al. (2021) which found that brand image has a positive and significant effect on e-wallet user loyalty. Thus, in the context of QRIS on the Dana e-wallet, brand image acts as the main factor driving student user loyalty.

e. The Effect of Perceived Security (X2) on QRIS User Loyalty (Y)

The direct effect test results show that Perceived Security does not have a significant direct effect on User Loyalty. This is proven by a T-statistic value of 1.335 and a P-Value of 0.183, which do not meet the significance criteria. These findings indicate that although security is an important aspect in digital transactions, security perceptions are not a key determinant of QRIS user loyalty in this research context. These findings contradict Saputra (2022) which shows in the study that Perceived Security has a positive and significant effect on Loyalty. However, the results of this study are in line with the research conducted by Safira & Sari (2024) that Perceived Security does not have a direct effect on the use of the DANA e-wallet.

f. The Role of Perceived Risk (Z) in Mediating the Effect of Brand Image (X1) on QRIS User Loyalty (Y)

The indirect effect test results show that Perceived Risk does not mediate the effect of Brand Image on User Loyalty. The T-statistic value of 0.111 and P-Value of 0.911 indicate that the indirect effect is not significant. Thus, the mediation hypothesis is rejected. These findings show that the effect of Brand Image on User Loyalty is direct and does not depend on changes in perceived risk. This means that a strong brand image can drive loyalty without having to go through a risk reduction mechanism. This confirms that in the context of student users, the loyalty formed is more affective and based on brand evaluation rather than risk considerations.

g. The Role of Perceived Risk (Z) in Mediating the Effect of Perceived Security (X2) on QRIS User Loyalty (Y)

The indirect effect test results also show that Perceived Risk does not mediate the effect of Perceived Security on User Loyalty. The T-statistic value of 0.930 and P-Value of 0.353 indicate that the indirect effect is not significant. Thus, Perceived Risk does not act as an intervening variable in this relationship. Theoretically, these results strengthen previous findings that security is perceived as a basic prerequisite in using QRIS, not as a factor that actively shapes loyalty through perceived risk. The theoretical implication of these findings is that in the context of a mature digital payment system, the relationship between security, risk, and loyalty is not always linear or mediative, but rather contextual and dependent on users' real experiences.

CONCLUSION

This study concludes that QRIS user loyalty among students of Universitas Muhammadiyah Pontianak is mainly determined by the strength of brand image, not by perceived security or perceived risk. Brand image is proven to have a direct and significant effect on user loyalty, while perceived security does not show a direct effect. On the other

hand, perceived risk has a negative effect on loyalty, but it does not act as a mediating mechanism between the independent variables and loyalty. These findings indicate that perceived risk has not become a major determining factor in the decision of continued QRIS usage among the respondent group studied.

Theoretically, the results of this study enrich loyalty studies in the context of digital payment systems by showing that in the young user segment, security and risk tend to be treated as basic conditions assumed to have been fulfilled. In this context, brand image functions as a differentiating element that is more relevant in shaping preferences and loyalty. Thus, this study critiques approaches that generally place perceived security and perceived risk as dominant determinants of fintech loyalty without considering user characteristics and the maturity level of technology adoption.

From a practical standpoint, these findings indicate that strategies to strengthen QRIS user loyalty need to be directed toward managing brand image consistently through user experience quality, system stability, and clarity of value communication. Security remains a non-negotiable prerequisite, but improving loyalty will not be achieved only by emphasizing that aspect. For educational institutions and merchants, the smooth implementation of QRIS and minimal transaction disruptions are important factors because they directly affect the service provider's brand perception.

This study has limitations in the relatively narrow population scope, so generalization of the findings still needs to be carried out carefully. Therefore, future research is suggested to involve more diverse populations and include other behavioral and psychological variables, such as trust, usage habits, and service quality, to obtain a more comprehensive understanding of loyalty formation in the digital payment ecosystem.

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