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Customer Satisfaction as a Mediator of the Relationship Between Digital Payment Systems and Customer Loyalty: A PLS-SEM Study of Rosa Flowers Bali

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Abstract

This study examines the relationship between digital payment systems, customer satisfaction, and customer loyalty, including the mediating role of customer satisfaction at Rosa Flowers Bali. While previous studies have primarily focused on mobile wallets and dedicated payment applications, this study extends the discussion to a small retail florist business where digital payment is part of the broader purchasing experience. A quantitative approach with a cross-sectional design was employed, involving 123 customers selected through purposive sampling. Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS. The results show that digital payment systems have a positive and significant relationship with customer satisfaction ($\beta = 0.809$; $p < 0.001$) and customer loyalty ($\beta = 0.381$; $p = 0.017$). Customer satisfaction also has a positive and significant relationship with customer loyalty ($\beta = 0.416$; $p = 0.012$). Furthermore, customer satisfaction significantly mediates the relationship between digital payment systems and customer loyalty ($\beta = 0.337$; $p = 0.019$), indicating partial mediation. These findings contribute empirical evidence on the role of digital payment experiences in shaping customer satisfaction and loyalty within a small retail florist context. The findings suggest that businesses may consider improving the convenience, security, flexibility, and efficiency of their payment processes to support customer satisfaction. However, the findings should be interpreted in light of the cross-sectional design and the study's focus on a single business at one location.

Keywords:
Digital Payment Systems; Customer Satisfaction; Customer Loyalty; Partial Least Squares; Structural Equation Modeling; Rosa Flowers Bali.

1. INTRODUCTION

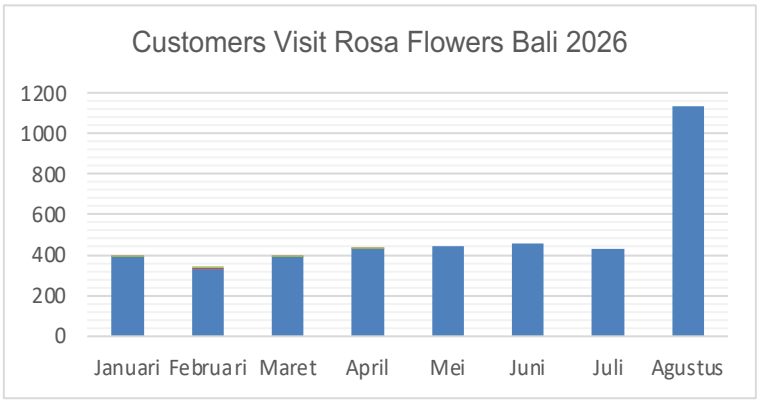
Digital technology has changed the way consumers conduct financial transactions, including the methods they use to pay for goods and services. The adoption of digital financial services expanded during the COVID-19 pandemic as consumers and businesses adapted to changes in transaction practices (Fu & Mishra, 2022). In retail businesses, digital payment systems provide alternatives to cash and may offer greater convenience, speed, flexibility, and security during transactions. These characteristics can contribute to the overall customer experience. However, the availability of digital payment options does not necessarily indicate that customers are satisfied or loyal to a business. Therefore, examining the relationships between digital payment systems, customer satisfaction, and customer loyalty is important for understanding how payment experiences relate to customer behavior.

Previous studies have examined the relationships between digital payment services, customer satisfaction, and customer loyalty across several digital financial service contexts. Research on mobile wallets and digital payment platforms has addressed various factors influencing customer loyalty. Ajina et al. (2023) focused on how different aspects of mobile-wallet services contribute to customer satisfaction and loyalty. Meanwhile Al

Amin et al (2023) explored the connections among electronic satisfaction, users' intentions to continue using the service, and electronic loyalty. Further investigations in mobile payment environments have also considered perceived value and customer experience as important factors associated with the development of customer loyalty (Zhang et al., 2023). More recent research has investigated factors associated with payment-application usage and loyalty (Bajwa et al., 2025), further explored customer loyalty in mobile-payment applications by considering factors such as perceived value, customer experience, and payment-application usage. These studies demonstrate that customer responses to digital payment services have been examined primarily within the context of the payment applications themselves.

A related stream of research has examined customer satisfaction in relation to loyalty within digital financial services. Adrian et al. (2026) analyzed how customer satisfaction mediates the relationship between e-wallet usage and loyalty. Similarly, Sugijanto et al. (2025) explored the associations between mobile-banking service quality, customer satisfaction, and customer loyalty. Despite offering valuable insights into the connections between digital financial services, customer satisfaction, and loyalty, these investigations were conducted in contexts that differ from small-scale retail businesses, where digital payment represents only one element of the broader consumer purchasing experience.

Although these studies provide relevant insights, most focus on dedicated digital payment applications or financial services rather than digital payment methods integrated into transactions within retail businesses. This distinction is important because customers of retail businesses evaluate more than the payment technology itself. Their overall purchasing experience may also involve product quality, service responsiveness, and order fulfilment. Consequently, the relationship between digital payment systems and customer loyalty may operate differently when payment facilities represent only one component of a broader retail experience. s shown in Figure 1, which illustrates monthly customer visit patterns from January to August 2026.



Source: Internal Financial and Customer Visit Report of Rosa Flowers Bali (2026)
Figure 1. Monthly Customer Visit at Rosa Flowers Bali, January-August 2026

Rosa Flowers Bali, a florist business located in Seminyak, Bali, this business setting offers an appropriate environment for investigating the issue, as its customer base consists of both domestic consumers and international tourists. To facilitate transactions, the business accommodates various payment methods, including Electronic Data Capture (EDC) terminals and other forms of digital payment. In this setting, digital payment systems form part of the purchasing process rather than the primary service offered to customers. Customers may evaluate the convenience, speed, flexibility, and security of payment transactions while also considering other aspects of their experience with the florist. This business environment makes it possible to investigate whether positive customer perceptions of digital payment facilities correspond with higher levels of satisfaction and loyalty toward the business.

The gap explored in the present research encompasses both contextual and analytical dimensions. While earlier investigations have addressed digital payment services alongside customer satisfaction and loyalty, the literature reviewed thus far has largely concentrated on standalone payment applications and digital financial platforms rather than digital payment facilities integrated into broader business operations. Less attention has been given to small retail businesses where digital payment functions as one component of a broader purchasing experience rather than as the primary service being evaluated. In particular, a florist business serving both local customers and international visitors provides a different setting from studies focusing on users of mobile wallets or dedicated payment applications. Customers in this setting evaluate not only the payment process but also their broader experience with the business. Accordingly, customer satisfaction is positioned as an intermediary variable that can clarify how customers' perceptions and assessments of digital payment systems may influence their loyalty toward the business.

The present study seeks to investigate the effects of digital payment systems on customer satisfaction and loyalty at Rosa Flowers Bali, as well as the association between customer satisfaction and customer loyalty. Furthermore, it examines whether customer satisfaction functions as a mediating mechanism through which digital payment systems influence customer loyalty. By examining these relationships in a small florist business

serving local and international customers, this study extends the discussion of digital payment experiences beyond dedicated financial applications and provides empirical evidence concerning their relationship with customer loyalty in a retail business context.

1.1. Digital Payment System

Digital payment systems enable customers to complete financial transactions electronically through available payment channels. In this study, the construct refers to customers' evaluations of their digital payment experiences at Rosa Flowers Bali, particularly in terms of convenience, transaction speed, flexibility, and security. These dimensions represent relevant aspects of the payment process that may influence customers' evaluations of their transactions.

Previous studies on mobile wallets and payment applications have examined how payment-service characteristics relate to customer satisfaction and loyalty (Ajina et al., 2023; Al Amin et al., 2023). Although these studies primarily focus on digital financial services, their findings provide a basis for understanding the relevance of payment experiences in other business contexts. In a retail setting, digital payment systems are not the main product or service but constitute an important component of the purchasing process. Therefore, customers' evaluations of these systems may contribute to their overall transaction experience.

1.2. Customer Satisfation

Customer satisfaction represents the assessment made by consumers regarding their experiences following the consumption of a product or the utilization of a service. According to Oliver (1980), satisfaction emerges from an evaluation process in which actual performance is assessed against expectations formed beforehand. A favorable level of satisfaction is likely to arise when the service delivered fulfills or surpasses what customers initially anticipate. In the context of Rosa Flowers Bali, customer satisfaction concerns customers' evaluations of the payment transaction, including its convenience, speed, security, and suitability for their needs. A payment process that meets customer expectations may generate a more favorable evaluation of the transaction. Thus, satisfaction represents the evaluative outcome of the payment experience rather than the technical attributes of the payment system itself.

1.3. Customer Loyalty

Customer loyalty can be understood as a sustained commitment by consumers to preserve their relationship with a particular business. Oliver (1999) conceptualizes loyalty as a strong intention to repeatedly purchase or remain supportive of a favored product or service, even when situational circumstances or promotional strategies from competitors create incentives to switch. Within the scope of this research, customer loyalty represents the extent to which consumers remain committed to Rosa Flowers Bali as a florist enterprise. Such commitment can be identified through repeated purchasing behavior, the willingness to recommend the business to other consumers, and the continued preference for its products and services. This conceptualization distinguishes loyalty toward the business from continuance intention toward a particular digital payment application. Consequently, customer loyalty in this study concerns the broader relationship between customers and the florist.

1.4. Hypothesis Development

1.4.1. Digital Payment Systems and Customer Satisfation

A digital payment process that customers perceive as convenient, efficient, secure, and flexible may contribute to a positive transaction experience. When the available payment facilities accommodate customers' preferences and expectations, customers may evaluate the transaction more favorably. Earlier investigations into mobile wallets and digital payment applications have likewise explored how various attributes of payment services contribute to the formation of customer satisfaction (Ajina et al., 2023; Al Amin et al., 2023). In the context of Rosa Flowers Bali, digital payment systems represent one component of the purchasing process. Therefore, favorable evaluations of the payment facilities are expected to be associated with higher customer satisfaction.

H1: Digital payment systems are positive and significant effect on customer satisfaction at Rosa Flowers Bali.

1.4.2. Digital Payment Systems and Customer Loyalty

Digital payment systems may also be associated with customer loyalty by facilitating a more convenient purchasing process. Payment facilities that accommodate customer preferences can reduce transaction-related inconvenience and contribute to a favorable interaction with the business. These positive experiences can encourage customers to make subsequent purchases and sustain their ongoing engagement with the business. However, customer loyalty in a retail business is influenced by various aspects of the purchasing experience, including product quality, service responsiveness, and order fulfilment. Therefore, digital payment systems represent one potential factor associated with customer loyalty rather than its sole determinant. Based on this rationale, the following hypothesis is proposed:

H2: Digital payment systems have a positive and significant effect on customer loyalty at Rosa Flowers Bali.

1.4.3. Customer Satisfation and Customer Loyalty

Customer satisfaction plays a significant role in shaping consumer loyalty. According to Oliver (1999) loyalty emerges through a gradual process in which consumers assess their experiences before establishing a lasting commitment to a particular product or service. When customers encounter favorable experiences, their positive perceptions may become stronger, encouraging them to preserve their association with the business over time. In the context of Rosa Flowers Bali, customers who are satisfied with their purchasing and payment experiences may be more willing to return, recommend the florist, and continue choosing its products and services. Although satisfaction is not the only determinant of loyalty, it represents an important evaluative factor that may support the development of a longer-term customer relationship. Accordingly, the following hypothesis is proposed:

H3: Customer satisfaction has a positive and significant effect on customer loyalty at Rosa Flowers Bali.

1.4.4. The Mediating Role of Customer Satisfation

Customer satisfaction is proposed as a mediating variable because it provides an explanatory link between customers' evaluations of digital payment systems and their loyalty toward a business. Oliver's (1980) satisfaction framework explains that customers evaluate experienced performance in relation to their prior expectations. When the payment process meets or exceeds these expectations, customers may develop a favorable evaluation of the transaction in the form of satisfaction.

Furthermore, Oliver (1999) conceptualizes customer loyalty as a deeper commitment that develops through customers' evaluations and favorable responses toward a preferred product or service. These theoretical viewpoints indicate that the influence of digital payment systems on customer loyalty may occur through a sequence of customer evaluations. Positive perceptions of the payment facilities can foster greater satisfaction, which, in turn, may reinforce customers' commitment to continue their relationship with the business.

From this perspective, customer satisfaction serves as an intermediary factor connecting digital payment systems with customer loyalty, rather than functioning solely as a separate consequence of payment-system implementation. This mediation framework indicates that digital payment systems may influence customer loyalty through two pathways: a direct relationship and an indirect association operating through customer satisfaction. Nevertheless, the proposed mechanism represents a theoretical relationship to be examined empirically and does not establish causal sequencing beyond the limitations of the research design. Based on this theoretical explanation, the following hypothesis is proposed:

H4: Customer satisfaction mediates the relationship between digital payment systems and customer loyalty at Rosa Flowers Bali.

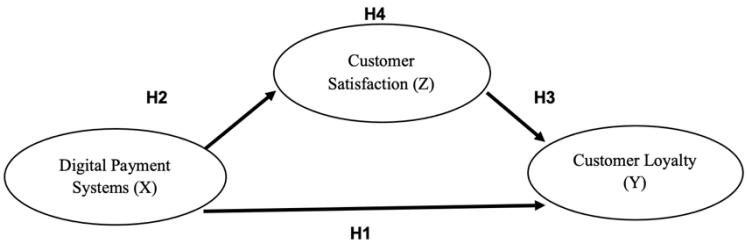


Figure 2. Hypotheses Development

H1 = X → Z; H2 = X → Y; H3 = Z → Y; H4 = X → Z → Y (indirect effect).

Based on the theoretical framework and previous studies, the following hypotheses are proposed:

H1: Digital payment systems are positive and significant effect on customer satisfaction at Rosa Flowers Bali.
H2: Digital payment systems have a positive and significant effect on customer loyalty at Rosa Flowers Bali.
H3: Customer satisfaction has a positive and significant effect on customer loyalty at Rosa Flowers Bali.
H4: Customer satisfaction mediates the relationship between digital payment systems and customer loyalty at Rosa Flowers Bali.

2. RESEARCH METHOD

2.1. Research Design and Sampling Technique

A quantitative research design was adopted to analyze the associations among digital payment systems, customer satisfaction, and customer loyalty at Rosa Flowers Bali. Primary data were obtained using structured questionnaires administered to customers starting in September 2026. The study population comprised individuals who had previously purchased goods or services from Rosa Flowers Bali and had utilized digital payment facilities during their transactions. The exact population size of eligible customers was not available from the business records.

Respondents were recruited through purposive sampling, with selection determined by specific criteria established prior to data collection. To qualify for participation, individuals had to be aged 17 years or older, have completed at least three purchases at Rosa Flowers Bali, possess prior experience with digital payment methods, and voluntarily agree to take part in the research. Both local customers and international tourists were included, while customers who had exclusively used cash were excluded. The established requirements were intended to ensure that participants possessed adequate experience with the business's purchasing activities and had relevant familiarity with the digital payment facilities examined in this research.

The study obtained 123 respondents. Sample adequacy was determined by applying the ten-times rule, a heuristic approach that establishes the minimum number of observations based on the highest number of structural relationships pointing toward an endogenous variable in the proposed model (Barclay et al., 1995; Hair et al., 2022). In the present research, customer loyalty was connected to two incoming structural relationships, originating from digital payment systems and customer satisfaction. On this basis, the minimum required sample was calculated as 20 participants (10 × 2). The study ultimately involved 123 respondents, thereby surpassing the minimum threshold established by this criterion. Nevertheless, the ten-times rule was used as a preliminary sampling guideline rather than a substitute for a formal statistical power analysis.

2.2. Questionnaire and Measurement

The questionnaire consisted of 12 measurement items representing three research constructs: digital payment systems, customer satisfaction, and customer loyalty. All research constructs were operationalized through four measurement indicators each. The questionnaire employed a five-level Likert scale to capture respondents' assessments, with scores ranging from 1, indicating strong disagreement, to 5, representing strong agreement. Data collection was conducted by distributing the instrument exclusively to participants who met the previously defined eligibility requirements. To provide greater transparency and facilitate replication, the complete questionnaire statements, indicator codes, and corresponding adapted sources are presented in Appendix A.

2.3. Instrument Testing

Prior to the primary survey, the research instrument was not subjected to an independent pilot study. Consequently, its measurement quality was examined using data obtained from the main survey through an assessment of the measurement model. Convergent validity was determined by examining outer loading values and Average Variance Extracted (AVE), whereas discriminant validity was examined through the Heterotrait-Monotrait Ratio (HTMT). Additionally, the Fornell-Larcker criterion could be applied as a complementary procedure to verify discriminant validity. The consistency of the measurement items was subsequently examined using Cronbach's alpha and composite reliability. These evaluation techniques are consistent with established methodological guidelines for assessing reflective measurement models within the Partial Least Squares Structural Equation Modeling (PLS-SEM) framework (Hair et al., 2022).

2.4. Data Analysis and Hypothesis Testing

The empirical data were processed using Partial Least Squares Structural Equation Modeling (PLS-SEM) through SmartPLS to investigate the associations among the study variables and assess the proposed structural relationships (Hair et al., 2022; Hair & Alamer, 2022). Evaluation of the measurement model covered three aspects: convergent validity, examined through outer loadings and Average Variance Extracted (AVE); discriminant validity, assessed using the Heterotrait-Monotrait Ratio (HTMT) and Fornell-Larcker criterion; and internal consistency reliability, determined through Cronbach's alpha and composite reliability. Subsequently, the structural model was examined using R^2, f^2, Q^2predict, RMSE, MAE, and VIF values to determine the model's explanatory capacity, magnitude of effects, predictive performance, and potential collinearity among the constructs.

The proposed hypotheses were examined through the bootstrapping procedure, applying a significance threshold of 5%. Relationships were regarded as statistically significant when the t-statistic exceeded 1.96 and the corresponding p-value was below 0.05. In addition, potential common method bias was examined using the full collinearity VIF approach, whereas skewness and kurtosis statistics were considered to characterize the distributional properties of the data. The mediating effect of customer satisfaction was further investigated by analyzing indirect effects and calculating the Variance Accounted For (VAF). The indirect effect of 0.337, relative to the total effect of 0.718, produced a VAF value of 46.94%, suggesting partial mediation, provided that the indirect relationship was statistically significant.

3. RESULTS AND DISCUSSION

3.1. Respondent Characteristics

This study involved 123 customers of Rosa Flowers Bali. Of these respondents, 75 (61.0%) were male and 48 (39.0%) were female. Regarding age, 50 respondents (40.7%) were aged 17–25 years, 52 (42.3%) were aged 26–35 years, 20 (16.3%) were aged 36–45 years, and one respondent (0.8%) was over 45 years old. The

reported figures illustrate the demographic profile of the study participants rather than reflecting variations in satisfaction or loyalty levels among different demographic categories. A detailed overview of the respondents' demographic characteristics is provided in Table 1.

Table 1. Respondent Characteristics

Jenis Kelamin	Number of Respondents	Persentase
Laki-laki/ Male	75	61,0%
Perempuan/ Female	48	39%
Total	123	100%
Age Groups	Number of Respondents	Persentase
>17-25 tahun / years old	50	40,7%
>26-35 tahun / years old	52	42,3%
>36-45 tahun / years old	20	16,3%
>45 tahun / years old	1	0,8%
Total	123	100%

Source: Data processed using SmartPLS.

3.2. Measurement Model Evaluation

An assessment of the measurement model was conducted to establish whether the indicators employed to represent digital payment systems, customer satisfaction, and customer loyalty met the required standards of validity and reliability.

3.2.1. Convergent Validity

Convergent validity was examined by analyzing the outer loading coefficients and Average Variance Extracted (AVE) for each research construct. The loading coefficients recorded values between 0.899 and 0.913 for digital payment systems, 0.844 and 0.939 for customer satisfaction, and 0.768 and 0.942 for customer loyalty. All measurement indicators achieved loading values above the recommended benchmark of 0.70, demonstrating adequate indicator validity. Furthermore, the AVE results reached 0.817 for digital payment systems, 0.824 for customer satisfaction, and 0.755 for customer loyalty. As each construct produced an AVE value greater than the required minimum of 0.50, the results confirmed that all three constructs satisfied the convergent validity requirements (Hair et al., 2022).

Table 2. Outer Loading Values

Indicator	Digital Payment Systems (X)	Customer Loyalty (Y)	Customer Satisfaction (Z)	Decision
X1.1	0,899			Valid
X1.2	0,913			Valid
X1.3	0,899			Valid
X1.4	0,904			Valid
Y1.1		0,895		Valid
Y1.2		0,942		Valid
Y1.3		0,768		Valid
Y1.4		0,863		Valid
Z1.1			0,923	Valid
Z1.2			0,844	Valid
Z1.3			0,939	Valid
Z1.4			0,921	Valid

Source: Data processed using SmartPLS.

Table 3. Convergent Validit (AVE)

	Average variance extracted (AVE)	Decision
Customer Satisfaction (Z)	0,817	Valid
Customer Loyalty (Y)	0,824	Valid
Digital Payment Systems (X)	0,755	Valid

Source: Data processed using SmartPLS.

The results in Tables 3 and 4 indicate that all indicators met the outer loading criterion and all constructs achieved AVE values above 0.50. These findings provide evidence of convergent validity for the measurement model.

3.2.2. Discriminant Validity

The discriminant validity of the research constructs was examined through the Heterotrait-Monotrait Ratio (HTMT) approach. The analysis produced values of 0.785 for the relationship between customer satisfaction and customer loyalty, 0.869 for the association between customer satisfaction and digital payment

systems, and 0.762 for the relationship between customer loyalty and digital payment systems. These findings indicate the degree of distinction between the constructs based on their respective HTMT coefficients. All values were below the 0.90 threshold, indicating that the constructs met the applied HTMT criterion (Henseler et al., 2015; Hair et al., 2022).

Nevertheless, the HTMT value of 0.869 between digital payment systems and customer satisfaction was relatively close to the threshold. This may reflect the conceptual relationship between the two constructs, particularly when payment-system indicators concern convenience, speed, and security, while satisfaction indicators evaluate customers' experiences with those same aspects. Although the constructs are treated as theoretically distinct, this proximity suggests that their empirical separation should be interpreted cautiously. The potential conceptual overlap is therefore acknowledged as a limitation of the study.

Table 4. Heterotrait-Monotrait Ratio (HTMT)

	Customer Satisfaction (Z)x	Customer Loyalty (Y)	Digital Payment Systems (X)
Customer Satisfaction (Z)			
Customer Loyalty (Y)	0,785		
Digital Payment Systems (X)	0,869	0,762	

Source: Data processed using SmartPLS.

3.2.3. Construct Reliability

The internal consistency of each research construct was examined through Cronbach's alpha and composite reliability coefficients. The results displayed in Table 6 showed that Cronbach's alpha coefficients fell within the range of 0.892–0.928, whereas composite reliability coefficients varied between 0.925 and 0.949. Since all calculated coefficients surpassed the minimum acceptable value of 0.70, the measurement indicators demonstrated satisfactory reliability and consistency in representing their respective constructs (Hair et al., 2022).

Table 5. Construct Reliability

	Cronbach's alpha	Composite reliability	Decision
Customer Satisfaction (Z)	0,928	0,949	Reliabel
Customer Loyalty (Y)	0,892	0,925	Reliabel
Digital Payment Systems (X)	0,925	0,947	Reliabel

Source: Data processed using SmartPLS.

3.3. Structural Model Evaluation

Evaluation of the structural model involved examining the coefficient of determination (R^2), effect size (f^2), and the model's predictive capability using the PLSpredict approach.

3.3.1. Coefficient of Determination (R^2)

The coefficient of determination (R^2) for customer satisfaction reached 0.654, suggesting that digital payment systems accounted for 65.4% of the variability in this construct, while the remaining 34.6% could be attributed to other variables beyond the proposed research model. Meanwhile, customer loyalty recorded an R^2 coefficient of 0.575, demonstrating that digital payment systems and customer satisfaction collectively contributed to explaining 57.5% of its variance. The other 42.5% was attributable to factors not incorporated into the model. Overall, these findings demonstrate that the proposed structural framework possesses explanatory capability in accounting for variations in both endogenous constructs (Hair et al., 2022).

Table 6. Coefficient of Determination (R^2)

Variable	R-square	R-square adjusted
Customer Satisfaction (Z)	0,654	0,650
Customer Loyalty (Y)	0,575	0,568

Source: Data processed using SmartPLS.

3.3.2. Effect Size (f^2)

The magnitude of each predictor's contribution to the endogenous variables was determined by examining the effect size (f^2). The analysis revealed that digital payment systems exerted a substantial effect on customer satisfaction, with an f^2 coefficient of 1.889, indicating a large effect. In contrast, the effect of digital payment systems on customer loyalty yielded a value of 0.118, which falls within the small-effect category. Customer satisfaction also demonstrated an f^2 value of 0.141 in explaining customer loyalty. Although this coefficient has not reached the conventional medium-effect benchmark of 0.15, its proximity to that threshold suggests a contribution approaching a moderate magnitude and warrants careful interpretation rather than being classified

as negligible. For reference, the established f² benchmarks are 0.02 for small effects, 0.15 for medium effects, and 0.35 for large effects (Cohen, 1988; Hair et al., 2022).

Table 7. Effect Size (f²)

Variable	Customer Satisfaction (Z)	Customer Loyalty (Y)	Digital Payment Systems (X)
Customer Satisfaction (Z)		0,141	
Customer Loyalty (Y)			
Digital Payment Systems (X)	1,889	0,118	

Source: Data processed using SmartPLS.

3.3.3. Predictive Relevance

The predictive capability of the proposed model was examined using the Q²predict coefficients obtained through the PLSpredict procedure. As reported in Table 9, customer satisfaction produced a Q²predict value of 0.645, whereas customer loyalty recorded a value of 0.495. Since both coefficients were positive and exceeded zero, the findings indicate that the model possesses predictive relevance for each endogenous construct. Furthermore, RMSE and MAE were included to represent the magnitude of prediction errors associated with each construct. Nevertheless, comparisons of these error measurements between customer satisfaction and customer loyalty are not appropriate because they represent distinct prediction targets. Similarly, the relative predictive superiority of the PLS model over the linear model benchmark cannot be determined solely from the available RMSE and MAE results. Such a comparison requires the corresponding prediction-error results from the linear model benchmark, as recommended in the PLSpredict procedure (Shmueli et al., 2019; Hair et al., 2022).

Table 8. Predictive Relevance and Prediction Errors

	Q²predict	RMSE	MAE
Customer Satisfaction (Z)	0,645	0,627	0,351
Customer Loyalty (Y)	0,495	0,760	0,457

Source: Data processed using SmartPLS.

3.4. Hypothesis Testing and Discussion

The hypotheses were evaluated through the bootstrapping technique implemented in SmartPLS. A hypothesized association was deemed statistically significant if its t-statistic was greater than 1.96 and its corresponding p-value was less than 0.05. Table 9 summarizes the findings of the analyses examining both direct and indirect effects.

Table 9. Direct and Indirect Effects and Hypothesis Testing

	Original sample (O)	T statistics	P values	Decision
Digital Payment Systems (X) -> Customer Satisfaction (Z)	0,809	11,172	< 0.001	Supported
Digital Payment Systems (X) -> Customer Loyalty (Y)	0.381	2.383	0.017	Supported
Customer Satisfaction (Z) -> Customer Loyalty (Y)	0.416	2.522	0.012	Supported
Digital Payment Systems (X) -> Customer Satisfaction (Z) -> Customer Loyalty (Y)	0.337	2.347	0.019	Supported

The findings indicate that the three direct effects and the indirect effect were all positive and statistically significant. Digital payment systems exerted a positive and significant influence on customer satisfaction ($\beta = 0.809$, $t = 11.172$, $p < 0.001$). A positive and significant relationship was also identified between digital payment systems and customer loyalty ($\beta = 0.381$, $t = 2.383$, $p = 0.017$). Similarly, customer satisfaction demonstrated a positive and significant effect on customer loyalty ($\beta = 0.416$, $t = 2.522$, $p = 0.012$). In addition, digital payment systems had a positive and significant indirect effect on customer loyalty through customer satisfaction ($\beta = 0.337$, $t = 2.347$, $p = 0.019$). Accordingly, the results provide empirical support for all four hypotheses (H1, H2, H3, and H4).

3.4.1. The Relationship Between Digital Payment Systems and Customer Satisfaction

The analysis reveals a substantial and positive relationship between digital payment systems and customer satisfaction ($\beta = 0.809$, $t = 11.172$, $p < 0.001$). This finding implies that customers who perceive the digital payment facilities more positively are also likely to express greater satisfaction with their transaction experiences at Rosa Flowers Bali. The magnitude of this coefficient can be explained by the integral function of payment services within the purchasing process. Factors such as transaction convenience, processing speed, and perceived security are directly encountered by customers during payment completion. Positive perceptions

of these features may therefore be closely associated with customers' overall evaluations of the payment experience. This explanation aligns with previous studies emphasizing the importance of digital payment service attributes in shaping customer evaluations (Ajina et al. 2023).

However, the strength of this relationship should be interpreted alongside the HTMT value of 0.869 between digital payment systems and customer satisfaction. The proximity of this value to the 0.90 threshold suggests that the constructs may share conceptually related measurement content. Consequently, the strong relationship may partly reflect the close conceptual connection between evaluations of payment-system attributes and satisfaction with the payment experience. This possibility does not invalidate the statistical result, but it calls for caution when interpreting the magnitude of the relationship.

3.4.2. The Relationship Between Digital Payment Systems and Customer Loyalty

Digital payment systems were positively and significantly associated with customer loyalty ($\beta = 0.381$, $t = 2.383$, $p = 0.017$). Consequently, H2 was confirmed. Nevertheless, the effect size was relatively small ($f^2 = 0.118$), suggesting that digital payment systems make a limited contribution to explaining variations in customer loyalty within the structural model. This result suggests that a favorable payment experience may support customers' willingness to maintain a relationship with Rosa Flowers Bali, but payment facilities alone do not capture the broader considerations involved in customer loyalty.

Unlike satisfaction with a particular transaction, customer loyalty may also reflect customers' wider experiences with the business, including product quality, flower freshness, product availability, service responsiveness, pricing, and the quality of customer relationships. These aspects are not all represented by the digital payment construct in the present model. Therefore, the smaller direct association with loyalty, compared with the association with satisfaction, is understandable: payment systems are closely connected to the transaction experience, whereas loyalty concerns a broader relationship between customers and the business. This interpretation is consistent with the view that customer loyalty involves more than the evaluation of a single service attribute (Bajwa et al. 2025).

3.4.3. The Relationship Between Customer Satisfaction and Customer Loyalty

Customer satisfaction exhibited a positive and statistically significant relationship with customer loyalty ($\beta = 0.416$, $t = 2.522$, $p = 0.012$), thereby confirming H3. This result suggests that respondents with more positive assessments of their experiences at Rosa Flowers Bali also tended to demonstrate a higher level of loyalty toward the business. The effect size was 0.141, which is below but close to the conventional medium-effect threshold of 0.15. Accordingly, the relationship should be described as a small effect approaching the medium threshold rather than simply as a weak or negligible effect (Cohen, 1988).

This result highlights the relevance of customers' overall evaluations of their experiences in understanding loyalty toward a florist business. In addition to the payment process, customers may consider whether the products meet their expectations, whether orders are handled appropriately, and whether the service experience is satisfactory. Customer satisfaction therefore represents one relevant aspect of the customer, business relationship, although it does not necessarily account for all factors associated with loyalty.

3.4.4. The Mediating Role of Customer Satisfaction

The indirect effect of digital payment systems on customer loyalty, mediated by customer satisfaction, was positive and statistically significant ($\beta = 0.337$, $t = 2.347$, $p = 0.019$). Meanwhile, the direct effect of digital payment systems on customer loyalty remained positive and significant ($\beta = 0.381$, $t = 2.383$, $p = 0.017$). The variance accounted for (VAF) was determined by dividing the indirect effect by the total effect, as expressed in the following formula:

$$VAF = 0.337 / (0.337 + 0.381) \times 100\% = 46.9\%.$$

The VAF value indicates that approximately 46.9% of the total effect was transmitted through customer satisfaction. Together with the significant direct and indirect relationships, this result supports partial mediation. Thus, customer satisfaction represents one pathway through which digital payment systems are associated with customer loyalty, while a significant direct relationship remains.

This result is in line with the findings of Sugijanto et al. (2025), who demonstrated that customer satisfaction mediates the relationship between mobile banking service quality, security, and customer loyalty. Although their research focused on mobile banking rather than a florist business, both studies indicate the relevance of customer satisfaction as an intermediate construct linking digital service evaluations with loyalty. The present study extends this discussion to the retail florist context, where digital payment is one component of the broader purchasing experience.

Taken together, the results indicate that digital payment systems have a stronger association with customer satisfaction than with customer loyalty. This distinction may be explained by the direct connection between payment-system features and customers' immediate transaction experiences, while loyalty represents a more comprehensive relationship between customers and the business. Nevertheless, these findings should be

understood in terms of associations rather than conclusive causal relationships, given that the research employed a cross-sectional design.

3.5. Study Limitations

Several limitations need to be taken into account when interpreting the study results. First, the respondent profile was predominantly composed of individuals aged 17–35 years, representing 83.0% of the total sample, while men accounted for 61.0% of participants. Such a demographic distribution may not adequately reflect the overall characteristics and preferences of all Rosa Flowers Bali customers. Accordingly, the findings should be considered in the context of the specific demographic composition of the respondents included in this research.

Second, the HTMT value between digital payment systems and customer satisfaction was 0.869, suggesting a relatively close empirical relationship between the two constructs. This may partly reflect conceptual similarities between the attributes used to evaluate digital payment systems and customers' satisfaction with the payment experience. Further research should refine the distinction between these constructs and assess potential common method bias using appropriate procedures, such as full collinearity VIF and Harman's single-factor test (Kock, 2015).

Third, the cross-sectional nature of the research limits the findings to respondents' assessments at a specific point in time, without establishing temporal precedence or conclusive causal relationships. Consequently, the observed relationships should be understood as statistical associations. Further studies may adopt longitudinal approaches, involve more diverse respondent characteristics, and incorporate additional customer-experience factors to develop a broader understanding of customer loyalty within the florist retail industry.

4. CONCLUSION

This study found that digital payment systems positively influence customer satisfaction and customer loyalty at Rosa Flowers Bali. Customer satisfaction also positively influences customer loyalty and partially mediates the relationship between digital payment systems and customer loyalty, with a VAF value of 46.9%. These findings indicate that convenient, efficient, and secure digital payment experiences are associated with better customer evaluations and stronger loyalty. Practically, Rosa Flowers Bali should maintain accessible digital payment facilities, including functional EDC machines and clearly displayed QRIS codes, while ensuring that employees can assist customers with payment difficulties. This research is subject to several limitations. First, the investigation was conducted at a single business and included only 123 participants, which may restrict the extent to which the findings can be generalized. Second, the cross-sectional approach provides a snapshot of the relationships at one point in time and cannot establish causal patterns over time. Third, reliance on self-reported questionnaire responses may give rise to common method bias. Additionally, the HTMT coefficient of 0.869 suggests a degree of conceptual overlap between the constructs of digital payment systems and customer satisfaction. To address these limitations, future studies could examine multiple businesses, recruit larger and more diverse samples, employ longitudinal research designs, and incorporate other relevant factors, including service quality, product quality, and customer trust.

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