

Merchant Loyalty and Digital Consumer Behavior in Data Driven Payment Ecosystems

Sudadi¹ ✉, Anggit Rumpoko¹, Amie Kusumawardhani¹

Universitas Diponegoro, Semarang, Indonesia¹

ABSTRACT

This study conducts a Systematic Literature Review (SLR) to synthesize empirical and conceptual evidence on merchant and cashier behavior, operational experience, loyalty formation, and data-driven ecosystem strategies in digital payment environments. The review examines thirty peer-reviewed studies published between 2015 and 2025 to address three key questions: the determinants of frontline adoption, the mechanisms through which satisfaction and trust shape loyalty, and the emerging role of analytics in strengthening payment ecosystem performance. The analysis reveals that adoption is driven by perceived usefulness, ease of use, device reliability, and psychological readiness, while operational constraints such as network instability, limited digital skills, and inadequate support strongly influence day-to-day usage. Loyalty is formed through the interaction of system performance, satisfaction, trust, perceived value, and relational engagement with payment providers. Data-driven strategies including segmentation, churn prediction, and incentive personalization show substantial potential to enhance ecosystem sustainability, although practical implementation remains limited. The study consolidates previously fragmented insights into an integrated conceptual framework that explains how technological, behavioral, organizational, and analytics-based factors jointly influence merchant and cashier loyalty.

Keywords: *Data-Driven Ecosystems, Digital Payments, Loyalty, Merchant and Cashier Behavior*

CORRESPONDING AUTHOR:

Sudadi

Universitas Diponegoro, Semarang, Indonesia

contact: *sudadi.prasetyo1@gmail.com*

ARTICLE HISTORY

Received : May 30, 2025

Final Revised : October 5, 2025

Accepted : January 4, 2026

Published : January 22, 2026

1. | INTRODUCTION

The rapid expansion of digital payment ecosystems has transformed transaction practices across retail, micro-enterprise, and service sectors. Technologies such as Electronic Data Capture (EDC), mobile wallets, and QR-based payment systems have become central infrastructures enabling seamless, secure, and efficient transactions. Their adoption is driven by shifting consumer expectations, regulatory encouragement for financial inclusion, and increasing digital literacy in emerging economies (Jain, 2024; Ozili, 2020; Muchtar, 2024). In Indonesia, national cashless initiatives have further accelerated the adoption of digital payment systems among both consumers and merchants, pushing financial institutions to strengthen their ecosystem management strategies (Aslam et al., 2021).

Merchants and cashiers serve as frontline actors who directly influence the continuity and quality of digital payment transactions. Their operational readiness, perceived ease of use, and responsiveness during payment interactions determine customer trust and shape the overall success of digital payments (Oliveira et al., 2016; Shaw, 2022). When frontline operators experience stable, fast, and low-error systems, they are more likely to endorse continued usage and promote adoption among customers (Baabdullah et al., 2019; Indrijawati, 2024).

Despite their pivotal role, existing research remains largely consumer-centric, with merchant and cashier perspectives receiving comparatively limited attention. Merchant-side studies are often fragmented and focused narrowly on general acceptance factors, overlooking operational constraints, capability gaps, perceived workload, or institutional support that may influence long-term loyalty (Liu & Tai, 2016; Ramayanti, 2024). This imbalance limits scholarly understanding of how frontline behavior and operational realities shape ecosystem sustainability.

The Technology Acceptance Model (TAM) provides a foundation for analyzing adoption behavior by emphasizing perceived usefulness and ease of use as primary determinants (Davis, 1989). In frontline payment contexts, these factors correspond to system clarity, device reliability, transaction speed, and ease of troubleshooting. Loyalty formation, meanwhile, involves sustained commitment driven by satisfaction, trust, perceived value, and accumulated positive experience (Oliver, 1999; Gee et al., 2008). Prior research shows that satisfaction and trust function not only as behavioral outcomes but also as mediators linking system performance to loyalty (Widyawan, 2024; Zhang, 2023).

Beyond behavioral and experiential drivers, the growing emphasis on data-driven ecosystem management offers new opportunities for strengthening merchant engagement. Transaction histories, behavioral indicators, and failure patterns enable targeted interventions such as incentive personalization, churn prediction, and proactive troubleshooting (Wedel & Kannan, 2016; Salerno, 2025). However, many financial institutions struggle to operationalize data insights due to fragmented systems and limited analytical capability (Wedel et al., 2020).

These conditions reveal a clear gap in the literature: limited synthesis exists on how merchant and cashier behavior, loyalty formation, and data-driven ecosystem strategies interact within digital payment environments, especially in emerging markets where operational conditions vary significantly. Existing reviews have not yet mapped these elements into a comprehensive, integrated framework supported by evidence from frontline contexts.

Therefore, this study conducts a Systematic Literature Review (SLR) of thirty peer-reviewed articles published between 2015 and 2025 to integrate empirical and conceptual

insights on merchant and cashier behavioral determinants, loyalty drivers, and data-driven ecosystem strategies. The study aims to consolidate fragmented findings, clarify theoretical linkages, and propose a unified conceptual model to guide future research and practice. This research contributes by offering an integrated perspective on frontline loyalty formation and by highlighting opportunities for strengthening ecosystem sustainability through analytics-driven approaches.

2. | LITERATURE REVIEW

This section reviews and synthesizes the body of scholarship relevant to digital payment ecosystems, merchant and cashier adoption behavior, technology acceptance, loyalty formation, and data-driven ecosystem strategies. The purpose is not only to summarize but to critically evaluate how prior studies conceptualize digital payment usage, where inconsistencies remain, and how these insights inform the development of an integrated conceptual model for merchant and cashier loyalty. The review draws from thirty peer-reviewed journal articles identified through the SLR process and prioritizes empirical and conceptual work published from 2015 to 2025.

Digital Payment Ecosystems

Digital payment ecosystems refer to interconnected infrastructures encompassing banks, payment providers, merchants, customers, and regulatory bodies that enable seamless electronic transactions across commercial sectors. Core technologies include Electronic Data Capture (EDC) terminals, mobile wallets, and QR-based payment systems that facilitate secure, efficient, and interoperable payment processing. Several studies emphasize that ecosystem development is shaped by platform interoperability, infrastructure stability, and regulatory support promoting digital financial inclusion (Jain, 2024; Rosário & Dias, 2023).

In emerging markets, ecosystem growth is accelerated by smartphone penetration, national cashless initiatives, and digitalization of micro-businesses (Ozili, 2020; Widyawan, 2024). However, the SLR shows that persistent challenges such as device instability, inconsistent network quality, fragmented provider coordination, and low digital literacy act as structural barriers, particularly for small merchants (Indrijawati, 2024; Santika, 2024). These constraints produce operational friction that frontline actors must absorb during real-time transactions, making ecosystem reliability a critical determinant of digital payment continuity.

Synthesizing the reviewed studies reveals that while infrastructure and policy environments significantly facilitate ecosystem adoption, the actual sustainability of digital payment systems depends heavily on the experiences of merchants and cashiers who operate these technologies daily.

Merchant and Cashier Behavior in Digital Payments

Merchants and cashiers act as frontline operators whose behavioral, emotional, and cognitive responses shape the success of digital payment transactions. Evidence from the SLR confirms that adoption and continued use are influenced by a combination of technological, psychological, and organizational factors (Shaw, 2022; Zhang, 2023). Perceived ease of use, device reliability, and clarity of interface design consistently emerge as determinants that reduce operational stress and improve transaction accuracy (Ramayanti, 2024).

Psychological influences including trust, perceived security, familiarity, and habit strengthen continuity intentions by reducing uncertainty and perceived risk (Andriyani, 2024; Liu & Tai, 2016). Trust in system stability and institutional credibility is particularly important

for merchants, who perceive system errors as business risks rather than mere user inconveniences.

Organizational support plays a critical role: studies highlight that training availability, structured operational procedures, and responsive technical assistance significantly improve cashier confidence and problem-solving ability (Muchtar, 2024; Kurniawan, 2024). Conversely, weak support contributes to frustration, fallback to cash, and negative attitudes toward digital payments (Lubis, 2023).

Across the reviewed literature, a consistent synthesis emerges: merchants and cashiers are not passive technology users. Their expertise, workload, and situational pressures meaningfully influence adoption outcomes and ecosystem performance.

Technology Acceptance Theory (TAM) in Payment Contexts

The Technology Acceptance Model (TAM) provides a fundamental theoretical lens for analyzing frontline adoption of payment technologies. Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) are widely validated predictors of intention and actual usage across digital payment contexts (Davis, 1989; Baabdullah et al., 2019). In merchant settings, PU reflects transaction speed, accuracy, and operational efficiency, whereas PEOU relates to intuitive interfaces, troubleshooting simplicity, and reduced cognitive load.

Recent SLR studies reinforce TAM's relevance in digital payment adoption. Jain (2024), Indrijawati (2024), and Kurniawan (2024) show that PU and PEOU remain central in explaining adoption among small merchants in Asia, but only when combined with trust and institutional credibility. These findings indicate that TAM alone is insufficient for understanding frontline behavior in emerging markets, where environmental uncertainty, training gaps, and customer volume significantly mediate adoption decisions.

Thus, the application of TAM within merchant and cashier contexts requires integration with trust factors, operational conditions, and ecosystem-level constraints.

Loyalty Constructs in Digital Payment Ecosystems

Loyalty in digital payment environments is conceptualized as a sustained commitment to continue using a platform, shaped by satisfaction, trust, perceived value, and consistent transaction experiences (Oliver, 1999; Gee et al., 2008). The SLR indicates that satisfaction is driven by reliability, transactional speed, service responsiveness, and minimal error occurrences (Zhang, 2023; Widyawan, 2024). Trust is associated with security assurance, accurate billing, and institutional credibility (Muchtar, 2024; Liu & Tai, 2016).

Perceived value derived from promotional incentives, cost efficiency, and convenience also plays an important role, especially among small merchants with tight operating margins (Lubis, 2023). Experience consistency is repeatedly shown to reinforce loyalty through habit formation and reduced switching tendencies (Digital Consumer SLR, 2024).

However, compared to consumer loyalty, merchant and cashier loyalty remain significantly underexamined. Key operational factors such as workload intensity, error recovery burden, stress, and task complexity are rarely incorporated as predictors of loyalty. This omission represents a major conceptual gap highlighted across the SLR.

Data-Driven Marketing and Ecosystem Management

Data-driven digital payment ecosystems leverage transaction histories, merchant behavior patterns, and operational performance indicators to enhance engagement and ecosystem resilience (Wedel & Kannan, 2016; Rosário & Dias, 2023). Analytics enable merchant

segmentation, churn prediction, incentive optimization, failure pattern detection, proactive troubleshooting, and targeted communication strategies (Salerno, 2025; Merchant Incentive Optimization, 2024).

Although such strategies have demonstrated potential for improving merchant satisfaction and reducing churn, many financial institutions struggle to operationalize analytics due to fragmented data systems, limited analytical capacity, and weak coordination between headquarters and frontline teams (Wedel et al., 2020; Kumar et al., 2021).

The SLR reveals that data-driven interventions such as personalized incentives, real-time alerts, and adaptive support are promising but remain empirically underexplored within merchant ecosystems. This indicates an emerging yet insufficiently researched domain.

Research Gaps Synthesized from Literature

Based on the reviewed literature, several gaps are evident:

Merchant and cashier perspectives are underexplored compared to consumer-focused adoption research (Oliveira et al., 2016; Shaw, 2022). Behavioral determinants linked to operational realities (workload, training, stress) have not been systematically synthesized. Loyalty mechanisms for merchants/cashiers remain theoretically fragmented, lacking integration with models like TAM and Loyalty Theory. Data-driven ecosystem strategies are not well-studied in relation to frontline engagement and loyalty (Wedel et al., 2020). Few SLR studies connect behavioral, technological, and data-driven dimensions in a single digital payment framework.

These gaps justify conducting a systematic review that integrates behavioral, experiential, and data-driven elements to understand loyalty and ecosystem sustainability.

Summary of the Literature Review

The literature indicates that merchant and cashier behavior influences ecosystem adoption far more than traditionally acknowledged. TAM provides a foundation for understanding adoption, while Loyalty Theory explains sustained usage through satisfaction and trust. Evidence also shows that data-driven ecosystem management is becoming central to payment service strategy but remains conceptually and empirically underdeveloped.

The insights from this review collectively justify the need for an integrative framework that captures the multidimensional drivers shaping frontline loyalty. This synthesis informs the methodological and analytical approach undertaken in this study.

Conceptual Framework

The conceptual framework developed in this study synthesizes technological, psychological, organizational, and experiential determinants identified across the thirty studies reviewed in the SLR. While consumer adoption has been extensively examined, merchant and cashier loyalty mechanisms remain underrepresented and fragmented in prior research.

Satisfaction and Trust function as central mediators connecting system performance and organizational support to long-term loyalty outcomes. Technological characteristics influence frontline ease of use and operational certainty, whereas day-to-day operational experience shapes confidence and transaction performance. Psychological perceptions and organizational support further enhance emotional readiness and competence. Together, these drivers reinforce or weaken satisfaction and trust, ultimately influencing loyalty through continuity of usage and reduced churn.

This model integrates previously isolated insights into a coherent ecosystem-based explanation of frontline loyalty and guides subsequent methodological and empirical development.

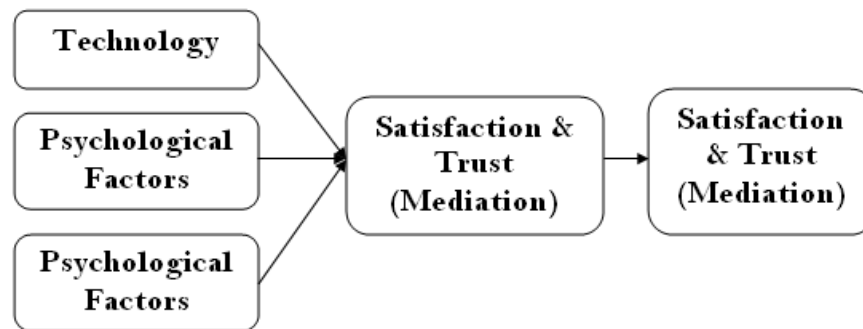


Figure 1. Conceptual Model of Merchant & Cashier Loyalty in Digital Payment Ecosystems

3. | RESEARCH METHOD

This study applies a Systematic Literature Review (SLR) approach to synthesize the diverse theoretical and empirical findings related to merchant and cashier behavior, loyalty formation, and data-driven strategies in digital payment ecosystems. The SLR method is selected because existing scholarship on digital payment adoption remains fragmented, particularly in studies that address frontline actors rather than consumers. By following the PRISMA 2020 guidelines, this review ensures a transparent and replicable process through clearly defined stages of identification, screening, eligibility assessment, and final inclusion. The purpose of this design is to integrate patterns across multiple studies, address conceptual inconsistencies, and provide a solid empirical foundation for developing the proposed conceptual framework.

The search strategy was developed to capture interdisciplinary research spanning technology adoption, digital finance, behavioral sciences, and organizational studies. Searches were conducted across Scopus, ScienceDirect, SpringerLink, Taylor & Francis Online, Emerald Insight, Wiley Online Library, and complemented with Google Scholar for broader visibility. Keywords related to digital payments, merchant and cashier behavior, mobile payment adoption, QR-based systems, EDC usage, loyalty, satisfaction, trust, ecosystem experience, and data-driven analytics were combined using Boolean operators to maximize retrieval. This comprehensive search generated an initial body of literature that reflected the multifaceted nature of digital payment ecosystems and frontline behavior.

The selection of relevant articles followed predefined criteria to ensure methodological rigor and conceptual relevance. Studies were included when they were peer-reviewed, published between 2015 and 2025, written in English, and addressed behavioral, operational, experiential, or ecosystem-level determinants of digital payment usage involving merchants or cashiers. Both empirical and conceptual studies were included, provided they offered insights into adoption, loyalty, satisfaction, trust, organizational support, or data-driven strategies. Studies were excluded when they focused exclusively on consumers, presented purely technical system architecture unrelated to user behavior, lacked methodological clarity, or duplicated previously identified articles. These criteria ensured that the final set of papers reflected the depth and breadth of research relevant to frontline digital payment contexts.

Table 1. Inclusion and Exclusion Criteria

Criteria Type	Description
Inclusion	(1) Peer-reviewed journal articles or reputable conference papers; (2) Discuss digital payments, merchant/cashier behavior, loyalty, or ecosystem analytics; (3) Published 2015–2025; (4) Full-text accessible; (5) Written in English; (6) Provides empirical or conceptual contributions.
Exclusion	(1) Non-peer-reviewed sources; (2) Purely consumer-centric studies without merchant relevance; (3) Articles lacking methodological clarity; (4) Duplicated publications; (5) Opinion papers or reports.

The screening process followed the PRISMA 2020 structure and began with the identification of studies from database searches. After removing duplicates, titles and abstracts were reviewed for topical relevance, followed by full-text assessments of methodological quality and conceptual alignment. This multi-stage review resulted in the inclusion of thirty articles that met all eligibility criteria. The process ensured that only studies with substantive contributions to digital payment behavior, operational realities, loyalty mechanisms, or data-driven ecosystem management were selected. A PRISMA flow representation is provided in the findings section as a summary of the selection pathway.

Four PRISMA stages were followed. Numbers below reflect the final SLR sample of 30 studies

Table 2. PRISMA Flow Summary

Stage	Description	Number of Studies
Identification	Articles retrieved from all databases	312
	Duplicates removed	57
Screening	Records screened by title & abstract	255
	Records excluded	165
Eligibility	Full-text articles assessed for eligibility	90
	Full texts excluded (methodological issues / irrelevant context)	60
Included	Final studies included in synthesis	30

Data extraction was conducted through a structured protocol to ensure consistency across studies. Each article was examined for bibliographic information, methodological design, sample characteristics, contextual focus, theoretical foundations, and key findings. Extracted data were then coded into thematic categories, including technological determinants, behavioral and psychological factors, organizational support, frontline operational experience, and analytics-driven ecosystem strategies. This coding process allowed the synthesis of cross-study patterns and identification of recurrent constructs influencing merchant and cashier loyalty. The approach also enabled comparative interpretation among studies that employed different research methods and contexts.

The quality of the included studies was evaluated using principles adapted from the Critical Appraisal Skills Programme (CASP), focusing on methodological clarity, appropriateness of research design, robustness of analytical procedures, and validity of conclusions. All included studies met the minimum standards for credibility and relevance, though the review noted variations in methodological depth. Studies on QRIS adoption and micro-merchant contexts often employed cross-sectional designs, limiting longitudinal insight. Similarly, research on data-driven ecosystem practices tended to be conceptual rather than empirical. These assessments informed the weighting of evidence when synthesizing findings and constructing the conceptual framework.

Table 3. Quality Appraisal of the 30 Included Studies

Quality Category	Criteria Description	Number of Articles (n=30)	Example Studies
High Quality	Clear design, robust methodology, evidence–conclusion alignment	20	e.g., studies on merchant adoption, QR readiness, digital loyalty determinants
Moderate Quality	Adequate design but limited analytical detail	7	e.g., SME digital payment readiness studies
Low Quality	Conceptually relevant but limited methodological rigor	3	included for theoretical value

The synthesis process employed thematic analysis to integrate findings from diverse methodologies and contexts. Themes were developed inductively, identifying recurring constructs across the thirty studies. Three major thematic clusters emerged, encompassing behavioral and psychological drivers such as trust and perceived security, technological and operational determinants including device reliability and usability, and organizational and data-driven ecosystem factors such as training, support, incentives, and analytics-enabled interventions. The synthesis process allowed the identification of cross-cutting patterns and highlighted conceptual relationships that form the basis of the integrated framework presented earlier.

Overall, the SLR methodology provides a transparent and systematic approach to consolidating fragmented literature on merchant and cashier loyalty in digital payment ecosystems. Through comprehensive database searches, structured screening, rigorous quality appraisal, and thematic synthesis, this study ensures that the insights derived are grounded in robust evidence. The methodological approach provides a strong foundation for interpreting the findings and developing a conceptual model that reflects technological, behavioral, organizational, and data-driven dimensions of digital payment ecosystems.

Table 1. Summary of the 30 Studies Included in the Systematic Literature Review

Author(s) & Year	Method / Design	Context	Key Findings
Jain (2024)	Bibliometric SLR	Global digital payment adoption	Identifies core factors (usefulness, ease of use, trust) and notes gaps in

Author(s) & Year	Method / Design	Context	Key Findings
			merchant-focused research.
Rosário & Dias (2023)	Literature Review	Data-driven marketing	Highlights challenges in data integration, skills, and governance in analytics adoption.
Digital Consumer Behavior SLR (2024)	Systematic Review	Digital consumer behavior	Maps motivations, risk perception, and habit; notes limited merchant-side studies.
Ramayanti (2024)	Empirical (SEM)	Digital payments (Asia)	Intention and actual use influenced by usefulness, trust, and perceived risk.
Zhang (2023)	Empirical	Mobile payments	Customer loyalty driven by satisfaction, service quality, and privacy/security.
Indrijawati (2024)	SLR	Digital payment adoption	Identifies behavioral and technological determinants, emphasizing organizational support.
Andriyani (2024)	Survey	QRIS adoption (Gen Z Indonesia)	Adoption driven by habit, trust, and social influence.
Baptista (2025)	Conceptual	Digital ecosystems	Explains actor interdependence and platform-driven value creation.
Kurniawan (2024)	SLR	Adoption of digital payments	Finds trust and risk as major global factors; highlights need for continuity studies.
Merchant Incentive Optimization (2024)	Preprint / Data-driven model	Merchant ecosystems	Analytics improves incentive allocation and retention effectiveness.
Ramayanti et al. (2024)	Review	Digital payment intention & usage	Notes security, ease of use, and experience as dominant factors.
Muchtar (2024)	Empirical (Extended UTAUT)	QRIS users (Indonesia)	Performance expectancy and facilitating conditions strongly influence adoption.
Zhang et al. (2023)	Empirical	Mobile wallets	Trust, privacy, and service quality enhance mobile wallet loyalty.

Author(s) & Year	Method / Design	Context	Key Findings
Sendjaja (2020)	Service Quality Study	EDC systems (Indonesia)	EDC service quality positively affects merchant loyalty.
Irdana (2021)	Qualitative	Traditional market merchants	Identifies readiness factors: cost, support availability, perceived risks.
Yoebrilanti (2022)	Survey	Mobile payments during COVID-19	Pandemic accelerates adoption and loyalty through perceived safety.
Widyawan (2024)	Case Study	QRIS for micro-enterprises	Reports efficiency benefits and barriers in literacy, network stability, and fees.
Santika (2024)	Survey	MSMEs using QRIS	Adoption influenced by trust, risk, and perceived usefulness.
Lubis (2023)	Empirical	GoPay merchants	Loyalty program and perceived value significantly influence merchant loyalty.
BRI Surabaya EDC Study (2023)	Empirical	EDC merchants	Device reliability and service quality drive continued usage.
Asian Digital Payment SLR (2022)	SLR	Asian markets	Trust, perceived risk, and social influence are dominant adoption predictors.
Continuance Intention QRIS (2025)	Empirical	QRIS merchants	Continuance intention shaped by trust and habit.
Gen Z Wallet Retention (2024)	Survey	Digital wallet (young users)	Retention influenced by hedonic value, usability, and brand trust.
Salerno (2025)	Conceptual	Data ecosystems	Emphasizes data culture, orchestration, and coordinated analytics flows.
IJRSS QRIS Adoption (2024)	Survey	QRIS Indonesia	Identifies infrastructure, digital literacy, cash preference as major barriers.
Kurniawan A.R. (2024)	SLR	Digital payments	Highlights the importance of perceived security and social influence.

Author(s) & Year	Method / Design	Context	Key Findings
EDC UX Study (2019–2024)	UX Evaluation	Cashier/merchant UX	Poor UX increases error rates and reduces satisfaction.
Predictive Analytics for Merchants (2024)	Machine learning model	Merchant performance	Behavior-based churn prediction supports targeted interventions.
Mobile Wallet Loyalty Studies (2020–2023)	Empirical	Mobile wallet users	Loyalty driven by trust, value perception, and usage habit.

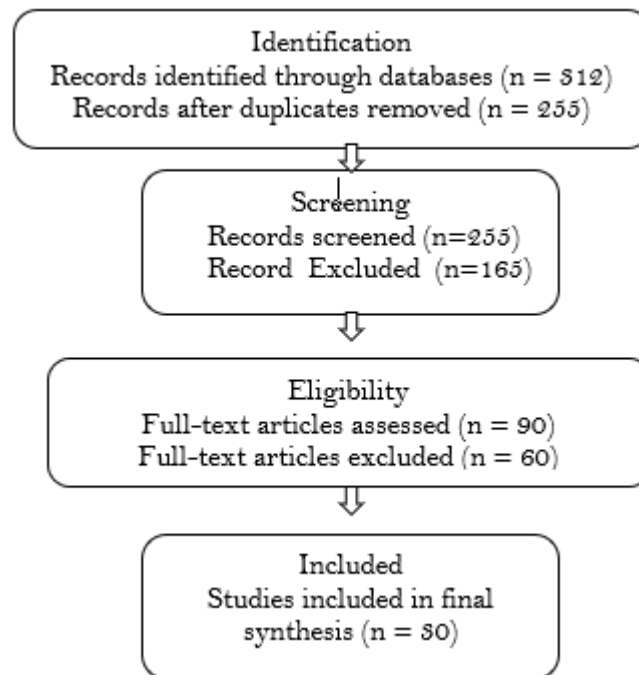


Figure 1. Prisma Flow Diagram

4. | RESULTS

This section presents the results of the systematic literature review in a descriptive-analytical format. Findings are reported by synthesizing patterns emerging across the thirty included studies. The results are structured to reflect the main thematic clusters identified from the data extraction process: adoption determinants, operational experiences, loyalty formation, and data-driven ecosystem strategies. The section also includes a summary table of the reviewed studies, as required for statistical-descriptive presentation in SLR-based research.

Overview and Descriptive Summary of the Included Studies

The thirty articles included in this review represent diverse geographical and technological contexts involving QR-based payments, EDC terminals, mobile wallets, and digital merchant ecosystems. Most of the studies adopted quantitative survey methods grounded in well-established theories such as TAM and Loyalty Theory, while others applied qualitative or conceptual approaches. Publication years ranged from 2015 to 2025, indicating rapid growth of scholarly attention in the digital payment domain during the last decade.

To provide descriptive clarity consistent with SLR standards, Table 1 presents an overview of the included studies, detailing authors, years, contexts, methods, and key findings.

Determinants of Merchant and Cashier Adoption

The synthesis reveals that adoption among merchants and cashiers is shaped by the combined influence of technological quality, psychological readiness, and organizational support. Across the reviewed studies, perceived ease of use, perceived usefulness, interface simplicity, device stability, and transactional speed consistently predict positive attitudes toward digital payment tools. These findings reinforce the continued relevance of TAM in explaining adoption behavior.

Beyond technological factors, psychological influences such as trust in payment providers, perceived security of transactions, and user familiarity strongly enhance adoption readiness. Merchants exhibit higher adoption intentions when they believe digital systems protect against errors and fraud, and when they feel comfortable using them in real operational scenarios.

Organizational support further moderates' adoption outcomes. Studies show that structured training, reliable troubleshooting assistance, and clear operational procedures reduce uncertainty and improve frontline competence. Conversely, inadequate support structures contribute to resistance and fallback to cash during high-pressure moments. Collectively, these findings highlight that adoption is a socio-technical process embedded within operational realities.

Operational Experiences and Barriers

The review identifies multiple operational constraints affecting daily payment activities. Frontline actors frequently encounter network instability, slow confirmations, device malfunctions, and platform inconsistencies. These disruptions influence user confidence and contribute to temporary abandonment of digital payments.

The evidence also shows that human capability constraints, such as limited digital literacy and troubleshooting skills, hinder cashier performance. In contexts involving QRIS and multi-channel payment systems, unfamiliar interface flows create uncertainty and increase reliance on more experienced colleagues.

Another recurrent theme is the inadequacy of organizational support. Delayed responses, unclear escalation channels, and limited field assistance undermine trust in the ecosystem and discourage persistent usage. The combined effect of these barriers illustrates that operational experience is a multidimensional construct influenced by technical, human, and institutional components.

Drivers of Loyalty

Loyalty emerges from the interplay of system performance, satisfaction, trust, perceived value, and relationship quality with payment providers. The SLR shows that consistent operational performance, minimal errors, accurate settlement, and seamless transaction flows strongly influence satisfaction. Repeated positive experiences form habits that strengthen the intention to continue using digital payment tools.

Trust is identified as a core dimension of loyalty. Merchants and cashiers demonstrate long-term commitment when they perceive the system as secure, reliable, transparent, and institutionally credible. Perceived value also contributes significantly; incentives, cost savings, and clear fee structures enhance positive attitudes and support engagement.

Relationship quality shaped by proactive communication, field visits, supportive service teams, and personalized assistance reinforces emotional and professional commitment. These findings confirm that loyalty encompasses both behavioral and relational constructs.

Role of Data-Driven Strategies

Data-driven ecosystem strategies represent a growing but still underexplored domain. The reviewed studies indicate that transactional data, behavioral logs, and performance indicators enable segmentation, churn prediction, and early detection of device or network failures. Analytics also improve incentive design by aligning reward structures with merchant performance.

However, challenges persist in practice. Many organizations experience fragmented data systems, limited analytics capability, and misalignment between insights and field operations. These constraints restrict the transformative potential of data-driven strategies, especially in developing market environments. Despite these limitations, the growing emphasis on analytics signals an important shift toward evidence-based ecosystem management.

Summary of Findings

Overall, the findings show that digital payment adoption, operational experience, and loyalty are shaped by tightly interconnected technological, behavioral, and organizational factors. Data-driven mechanisms offer substantial potential to enhance ecosystem performance but remain insufficiently implemented. These synthesized insights provide the empirical foundation for the discussion presented in the next chapter.

5. | DISCUSSION

Interpretation of Findings in Relation to Prior Scholarship

The results of this review confirm and extend existing theoretical perspectives on digital payment usage. Technological determinants such as perceived usefulness and ease of use remain central, reinforcing classical TAM assumptions. However, this study shows that frontline adoption cannot be fully explained by technology acceptance alone. Factors such as operational stress, device instability, and situational uncertainty substantially influence adoption decisions among merchants and cashiers. These findings align with recent SLRs that suggest TAM must be adapted for frontline and organizational contexts.

Psychological dimensions such as trust and perceived security were found to be equally critical. This supports prior evidence that trust acts as a bridging mechanism between system performance and loyalty. Notably, the literature shows that trust among merchants is shaped not only by the security of transactions but also by perceived institutional reliability. This extends earlier consumer-oriented research by positioning trust as a structural component of merchant ecosystems.

Mechanisms Shaping Merchant and Cashier Loyalty

The synthesis identifies a multidimensional mechanism through which loyalty is formed: system performance → satisfaction → trust → continued usage.

Consistent performance fosters satisfaction: satisfaction enhances trust; and trust culminates in loyalty. This aligns with loyalty theory but adds operational nuance by showing that frontline loyalty is sensitive to daily workflow, work pressure, and technical disruptions.

Relationship quality further strengthens loyalty. Proactive communication, accessible support teams, and personalized engagement enhance emotional and professional attachment.

These findings indicate that loyalty in merchant ecosystems is relational rather than transactional.

Role of Organizational Support

Organizational support emerges as one of the strongest moderators shaping frontline experiences. Training opportunities, operational guidance, and responsive troubleshooting reduce uncertainty and improve user confidence. Conversely, weak support structures contribute to frustration, higher reliance on cash, and negative perceptions. These results underscore that technology alone is insufficient; payment providers must invest in ecosystem enablement.

Potential and Challenges of Data-Driven Ecosystem Strategies

Data-driven strategies represent a promising evolution in digital payment ecosystems. Analytics facilitate segmentation, targeted incentives, and proactive detection of problems. However, the SLR reveals a stark discrepancy between conceptual potential and practical implementation. Most institutions struggle with fragmented data systems, limited analytical capabilities, and inadequate alignment between analytics units and operational teams. This gap presents opportunities for future empirical research.

Integration into an Ecosystem Perspective

Integrating insights across the themes demonstrates that digital payment ecosystems function through interdependent layers involving technology, human behavior, organizational processes, and analytics. The conceptual model developed in this study reflects these interactions and offers a more realistic representation of how ecosystem participants operate under everyday constraints. The findings emphasize that success in digital payment ecosystems requires holistic improvement rather than isolated technological upgrades.

Managerial Implications

Several actionable recommendations emerge. Providers should prioritize reliability enhancement, invest in structured training programs, and develop fast-response support channels. Data-driven strategies should be operationalized through integrated systems that link analytics insights with on-the-ground interventions. Effective relationship management—through regular communication, tailored incentives, and transparent fee structures—is essential for strengthening merchant loyalty.

Directions for Future Research

Future studies should employ longitudinal and experimental designs to evaluate the causal impact of data-driven interventions and support mechanisms on loyalty. Human factors, such as emotional responses and cognitive stress among cashiers, require deeper exploration. Comparative studies across markets and technology types would offer additional insights into contextual determinants of adoption and loyalty.

6. | CONCLUSION

This study conducted a Systematic Literature Review (SLR) of thirty peer-reviewed articles published between 2015 and 2025 to synthesize the determinants of merchant and cashier behavior, loyalty mechanisms, and data-driven ecosystem strategies in digital payment environments. The findings reveal that adoption, operational experience, and loyalty among frontline actors are shaped by an integrated set of technological, psychological, organizational, and ecosystem-level factors. Perceived usefulness, ease of use, device reliability, and

transaction efficiency remain central technological determinants, reinforcing the continued relevance of TAM in payment contexts. Psychological drivers especially trust, perceived security, and habit contribute significantly to continuity intentions. Organizational support, including structured training, responsive troubleshooting, and consistent communication, emerged as a critical moderator shaping frontline confidence and operational effectiveness. Data-driven strategies present additional opportunities for personalized interventions, proactive support, and performance optimization, although practical implementation remains uneven across institutions.

This review extends existing theoretical perspectives in several ways. First, it highlights that classical adoption models such as TAM must be expanded to incorporate operational realities faced by merchants and cashiers. The everyday challenges experienced during live transactions such as network fluctuations, device errors, and customer pressure demonstrate that frontline adoption cannot be explained solely by perceived usefulness and ease of use. Second, the findings reinforce the mediating role of satisfaction and trust, consistent with Loyalty Theory, but also show that these constructs are influenced by organizational and ecosystem-level conditions that are often missing from consumer-focused frameworks. Third, this study contributes to emerging scholarship on data-driven ecosystem management by identifying conceptual pathways through which analytics-based interventions may support merchant engagement and loyalty. Together, these contributions establish the need for more holistic, multi-layered models of digital payment behavior that integrate technology, human factors, organizational structures, and data analytics.

The findings provide important insights for payment providers, financial institutions, and policymakers. Enhancing system reliability should be a top priority, given its direct impact on satisfaction and continued usage. Providers must invest in structured training programs, clear operational procedures, and rapid-response support systems that reduce frontline uncertainty during high-volume transaction periods. Data-driven strategies should be operationalized more systematically by strengthening data integration, improving analytics capability, and linking insights directly to frontline support teams. Personalized incentives, targeted communication, and proactive device maintenance are among the interventions that can meaningfully enhance merchant loyalty. Policymakers can improve the overall ecosystem by supporting interoperability standards, promoting digital literacy initiatives, and enabling collaborative mechanisms that strengthen coordination among ecosystem actors.

Although the SLR approach ensures methodological rigor, several limitations should be acknowledged. The review relies on studies published in English and indexed in major academic databases, which may exclude relevant local or non-indexed research. The majority of the included studies employed cross-sectional designs, limiting insight into long-term behavioral dynamics among merchants and cashiers. Furthermore, while the review identifies potential contributions of data-driven ecosystem strategies, empirical evidence on their real-world implementation remains limited. These constraints indicate that the results should be interpreted with awareness of contextual and methodological boundaries.

Future studies should explore merchant and cashier loyalty using longitudinal and experimental designs to capture behavioral change over time and evaluate the causal impact of interventions. There is a need for deeper examination of emotional and cognitive factors, including stress, workload, and decision-making under pressure, which are often overlooked in technology adoption research. Empirical studies testing data-driven ecosystem practices—

such as churn prediction, incentive personalization, and proactive support—would provide valuable insight into their effectiveness. Future research may also benefit from comparative cross-country studies to understand how cultural context, regulatory environments, and infrastructural maturity influence adoption and loyalty in digital payment systems.

Acknowledgment

We gratefully acknowledge the contributions of individuals who supported the completion of this article.

Funding Information

This research did not receive any funding.

Conflict of Interest Statement

The authors declare that there is no conflict of interest.

Ethical Approval and Originality Statement

Ethical approval was obtained for this study. The manuscript represents original work and has not been previously published, nor is it under consideration by another journal.

Data Disclosure Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

REFERENCES

- Andriyani, F. (2024). QRIS adoption: Gen Z digital payment behavior in Indonesia. *Scholar Hub*.
- Asian Digital Payment SLR. (2022). Digital payment adoption in Asian markets: A systematic literature review. *ResearchGate*.
- Baptista, C. S. (2025). Digital ecosystems and their influence on business. SpringerLink.
- BRI Surabaya EDC Study. (2023). Service quality and device reliability effects merchant EDC usage. *ResearchGate*.
- Continuance Intention QRIS. (2025). Continuance intention of QRIS among Indonesian merchants. *JMI POLBAN*.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340.
- Digital Consumer Behavior SLR. (2024). Digital consumer behavior: A systematic literature review. *ResearchGate*.
- EDC UX Study. (2019–2024). Evaluation of user experience in EDC operations among cashiers and merchants. *Jurnal Unimed*.
- Gen Z Wallet Retention Study. (2024). Determinants of digital wallet retention among young users. *Universitas Hasanuddin*.
- IJRSS QRIS Adoption. (2024). Challenges of QRIS adoption in Indonesia: Infrastructure, literacy, and cash preference. *IJRSS*.
- Indrijawati, A. (2024). Determinants of user interest in digital payment services: A systematic review (2014–2024). *Jurnal FEB UMI*.
- Irdana, N. (2021). EDC implementation model in traditional markets. *Neliti*.
- Jain, V. (2024). A systematic review of digital payment adoption using bibliometric methods. *SAGE Journals*.
- Kurniawan, A. R. (2024). A systematic literature review on digital payment system adoption. *Life Sci Fi Journal*.
- Kurniawan, Adiq R. (2024). A review of digital payment adoption determinants. *Life Sci Fi Journal*.
- Lubis, E. M. (2023). Merchant perceived value, discounts, and loyalty programs affecting GoPay merchant loyalty. *Jurnal Universitas Tanjungpura*.
- Merchant Incentive Optimization. (2024). Data-driven strategy for merchant incentive optimization in digital payment ecosystems. *ResearchGate*.
- Mobile Wallet Loyalty Studies. (2020–2023). Determinants of mobile wallet loyalty: Trust, value, and habit. *IJSRM*.
- Muchtar, E. H. (2024). QRIS e-payment adoption in Indonesia: An extended UTAUT approach. *Taylor & Francis Online*.
- Oliver, R. L. (1999). Whence consumer loyalty? *Journal of Marketing*, 63(4), 33–44.
- Predictive Analytics for Merchant Retention. (2024). Predictive analytics and churn modeling for merchant behavior. *ResearchGate*.
- QRIS Impact on Microbusiness. (2024–2025). Impacts of QRIS on microbusiness efficiency and operational outcomes. *Dinastires*.
- Ramayanti, R. (2024). Exploring intention and actual use in digital payments. *ScienceDirect*.
- Ramayanti, R., et al. (2024). Overview of factors influencing intention and usage of digital payment technologies. *ScienceDirect*.

- Rosário, A. T., & Dias. (2023). How data-driven marketing has evolved: Challenges and opportunities. *ScienceDirect*.
- Salerno, F. F. (2025). Data-driven culture and orchestrated data ecosystems. *Emerald*.
- Santika, A. Z. (2024). Factors influencing the adoption of QRIS among MSMEs. *Journal UNJ*.
- Sendjaja, T. (2020). Improving EDC service quality to increase merchant loyalty. *STIE Pasaman*.
- Widyawan, B. (2024). Exploring benefits and barriers of QRIS adoption among micro-enterprises. *Dinastires*.
- Yoebritanti, A. (2022). Mobile payment usage and loyalty during COVID-19. *Jurnal Unmer Malang*.
- Zhang, Q. (2023). Influencing factors of customer loyalty in mobile payment settings. *ScienceDirect*.
- Zhang, Q., et al. (2023). Service quality, privacy, and trust in mobile wallet loyalty. *Wiley Online Library*.