THE IMPACT OF MODERN PAYMENT ON RETAIL BUSINESS PERFORMANCE

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ABSTRACT

This systematic literature review investigates the impact of modern payment methods on retail business performance, focusing on key technologies such as mobile wallets, contactless systems, QR code payments, biometric authentication, and blockchain-based digital currencies. The study addresses three central questions: the types of modern payment systems adopted in retail, their effects on sales growth, customer satisfaction, and operational efficiency, and the challenges faced during implementation. Utilizing the PRISMA methodology, 2010–2023 empirical studies were sourced from major academic databases and synthesized using narrative analysis and VOSviewer-based bibliometric mapping. Results show that modern payment methods positively influence retail outcomes by reducing transaction times, improving financial and inventory management, and increasing consumer loyalty. However, disparities in infrastructure, digital literacy, and regulatory readiness continue to hinder adoption, especially among SMEs and older consumers. The findings highlight the need for collaborative strategies involving retailers, technology providers, and policymakers to ensure inclusive and effective digital transformation in the retail sector. This review contributes by providing an integrated framework for understanding how modern payment innovations shape both operational and strategic dimensions of retail business performance.

Keywords: **Adoption, Customer Satisfaction, Digital Payment, Retail Performance, Technology Integration**

1. INTRODUCTION

The global retail landscape has entered a transformative era marked by an unprecedented convergence of technological innovation and evolving consumer behaviors (Mardhiyah, 2022; Tan, 2022; Winata, 2022). Central to this evolution is the increasing penetration of digital technologies into the domain of retail payments. From mobile wallets and contactless payments to frictionless "just walk out" systems and smart shopping carts, modern payment methods have become critical to shaping the way retail businesses operate, engage customers, and sustain competitive advantage. These developments are not merely iterative updates to existing infrastructure; they signify a paradigm shift in how commerce is conceptualized and executed. For brick-and-mortar retailers in particular, adapting to this rapidly changing digital ecosystem is no longer a matter of convenience but of strategic necessity (Arma, 2022; Putri, 2022; Setiawan, 2022).

In this dynamic environment, retail businesses are responding to mounting consumer expectations for seamless, secure, and personalized transaction experiences. This response has led to the rapid deployment of innovative payment technologies aimed at enhancing both front-end and back-end processes. Mobile payment systems powered by Near Field Communication (NFC), biometric authentication, and blockchain-backed cryptocurrency wallets now offer consumers

unprecedented levels of convenience, speed, and financial security. Retailers, in turn, benefit from increased transactional efficiency, improved data collection capabilities, and enhanced customer engagement. As technology continues to dissolve the boundaries between digital and physical retail experiences, the shift toward a cashless society appears not only inevitable but foundational to the next stage of retail evolution (Rolando et al., 2022; Rolando & Mulyono, 2025a; Wijaya, 2022).

However, this transformation is not without its challenges. Despite the growing enthusiasm surrounding digital payment systems, significant barriers remain in terms of technological adoption, infrastructural readiness, and consumer inclusivity. While younger, digitally native demographics have swiftly embraced mobile payments and e-wallets, older populations and small-scale businesses often struggle to keep pace due to digital literacy gaps and infrastructural constraints. Moreover, the ongoing transition toward cashless economies has raised broader questions regarding data privacy, cybersecurity, and regulatory oversight. These multifaceted developments underscore the importance of understanding how modern payment methods are impacting retail business performance across various contexts, geographies, and retail segments (Ingriana et al., 2024; Mulyono, 2024; Rolando & Mulyono, 2025b).

It is against this backdrop that the present systematic literature review is situated. The purpose of this review is to synthesize existing empirical evidence on the impact of modern payment methods—specifically mobile wallets, contactless systems, and emerging digital currencies—on retail performance outcomes. These outcomes include, but are not limited to, customer satisfaction, operational efficiency, sales growth, and strategic differentiation. By aggregating insights from a diverse array of academic studies, this review aims to provide a comprehensive understanding of the technological, managerial, and behavioral implications of payment innovation in the retail sector.

The need for such a synthesis is particularly pressing in light of the fragmented nature of current research on this topic. Existing studies have approached the subject from a variety of disciplinary angles, including marketing, information systems, operations management, and economics. While this diversity enriches the field, it also results in a lack of coherence and integrated insight. Some studies focus narrowly on the technical affordances of payment platforms, while others examine customer behavior or business performance in isolation. Few, however, offer a holistic view that connects technological adoption with tangible performance metrics within retail environments. This review addresses that gap by systematically evaluating the literature through an integrative lens that considers both the enablers and outcomes of digital payment adoption (Mulyono et al., 2025; Rolando, 2024; Rolando & Ingriana, 2024).

This endeavor is further justified by the increasing centrality of fintech solutions in post-pandemic retail recovery strategies. The COVID-19 pandemic catalyzed a dramatic acceleration in the adoption of contactless and mobile payment systems, as concerns over hygiene and physical distancing prompted a widespread rejection of cash-based transactions. As a result, digital payment platforms are now being regarded as critical infrastructure rather than ancillary services. Retailers are investing heavily in these systems not only to meet new safety standards but also to future-proof their operations against potential disruptions. Given this context, a systematic appraisal of the current state of knowledge can offer valuable strategic insights for both academics and practitioners (Maha et al., 2025; Rahardja et al., 2025; Wigayha et al., 2025c).

To guide this review, the following research questions were formulated: (1) What are the different modern payment methods currently utilized in retail? (2) How do these payment methods influence retail business performance metrics such as sales, customer satisfaction, and operational efficiency? (3) What challenges do businesses face in implementing modern payment methods? These questions are designed to capture the breadth and depth of the topic and to uncover patterns, contradictions, and gaps within the literature (Rolando, Chandra, et al., 2025; Rolando, Widjaja, et al., 2025; Wigayha et al., 2025b).

In exploring these questions, the review considers a broad spectrum of payment technologies, ranging from mature solutions such as NFC and QR code-based systems to more nascent technologies like biometric payments and blockchain-enabled smart contracts. The scope of the review spans both developed and emerging markets, recognizing that the impacts of digital payment adoption may vary significantly depending on local economic conditions, regulatory environments, and consumer demographics. While the primary focus is on in-store retail operations, relevant insights from e-commerce contexts are also incorporated, particularly where they highlight intersections or contrasts with physical retail experiences .

The boundaries of the review are defined by several inclusion criteria. Only empirical studies published between 2010 and 2023 were considered, ensuring that the findings are relevant to contemporary technological conditions. Additionally, the review prioritizes peer-reviewed journal articles and conference proceedings to maintain methodological rigor and credibility. Studies that focus solely on banking, non-retail service industries, or theoretical frameworks without empirical validation were excluded to maintain a clear and consistent analytical focus.

By synthesizing and analyzing findings across diverse contexts, this review makes several contributions to the academic and practitioner communities. First, it consolidates a wide range of empirical evidence into a cohesive narrative that delineates the primary mechanisms through which modern payment methods impact retail performance. Second, it identifies and categorizes the key barriers to adoption, including technological, organizational, and regulatory challenges. Third, it highlights gaps in the current literature that warrant further research, such as the long-term effects of digital payment systems on consumer loyalty, the role of generational differences in adoption behaviors, and the impact of payment innovations on small and medium-sized retail enterprises.

Furthermore, the findings of this review have significant implications for retail strategy, technological investment, and policy formulation. For business leaders, understanding the performance implications of various payment technologies can inform more effective digital transformation strategies. For policymakers, the review underscores the importance of developing inclusive regulatory frameworks that support financial innovation while protecting vulnerable populations. For technology providers, the synthesis offers insight into the features and functions that retailers value most in payment platforms—insights that can guide product development and marketing.

The remainder of this paper is organized as follows. The methodology section outlines the systematic procedures used to identify, select, and analyze the literature, including details on the databases searched, inclusion and exclusion criteria, and data synthesis techniques. The results section presents the findings from the selected studies, organized around key themes such as payment types, performance outcomes, and adoption challenges. The discussion section interprets these findings in light of the review questions and explores their implications for research and practice. Finally, the paper concludes with a summary of key insights, limitations of the study, and recommendations for future research.

In sum, this review provides a timely and comprehensive assessment of how modern payment methods are reshaping retail business performance. As retail continues to evolve in response to technological advances and shifting consumer expectations, understanding the strategic role of payment innovation is essential. By drawing together diverse strands of literature into an integrated analytical framework, this study not only clarifies the current state of knowledge but also charts a path forward for both research and practice in the digital age of retail commerce (Widjaja, 2025; Wigayha et al., 2025a).

2. RESEARCH METHOD

This systematic literature review aims to explore the impact of modern payment methods—such as mobile wallets, contactless payments, and cryptocurrencies—on retail business performance, specifically examining outcomes related to sales growth, customer satisfaction, and operational efficiency. To achieve this objective, a structured and rigorous methodology was employed, following the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to ensure transparency and reproducibility in the selection and synthesis of relevant studies.

The review was guided by three central research questions: (1) What modern payment methods are currently implemented in retail settings? (2) How do these payment methods influence key retail performance metrics? and (3) What challenges do businesses encounter when adopting these technologies? To address these questions, a comprehensive search strategy was executed across five major academic databases: Google Scholar, Scopus, Web of Science, PubMed, and Business Source Complete. The search was limited to peer-reviewed articles published between 2010 and 2023 in the English language. A combination of relevant keywords, including "modern payment methods," "retail business performance," "mobile payments," "NFC," and "digital wallets," was used. Boolean operators such as AND and OR were applied to refine the search results and enhance coverage. Additionally, backward snowballing was conducted by screening the reference lists of selected papers to capture additional relevant literature.

Inclusion criteria were strictly applied to retain empirical studies focusing on modern payment technologies within retail contexts that reported measurable impacts on business performance. Studies had to be peer-reviewed journal articles or conference papers, published in English, and fall within the designated time frame. Exclusion criteria were also enforced, which included non-empirical literature (e.g., opinion pieces or conceptual papers), articles unrelated to retail, and studies lacking measurable performance outcomes. This rigorous selection process ensured the methodological soundness and contextual relevance of the included studies.

Criteria Type	Criteria
Inclusion	Empirical studies on modern payment methods in retail
	Peer-reviewed journal articles or conference papers
	Focus on performance metrics (sales, efficiency, satisfaction)
	Published in English between 2010 and 2023
Exclusion	Non-English articles
	Reviews, editorials, opinion pieces
	Studies unrelated to the retail context
	Articles lacking empirical data

Table 1. Inclusion and Exclusion Criteria

The screening and selection process followed the PRISMA framework, which involved four main stages: identification, screening, eligibility, and inclusion. Initially, all search results were aggregated and duplicates were removed. The remaining records were screened based on their titles and abstracts, followed by a full-text review of potentially eligible studies. Studies that did not meet the inclusion criteria or lacked sufficient methodological rigor were excluded.
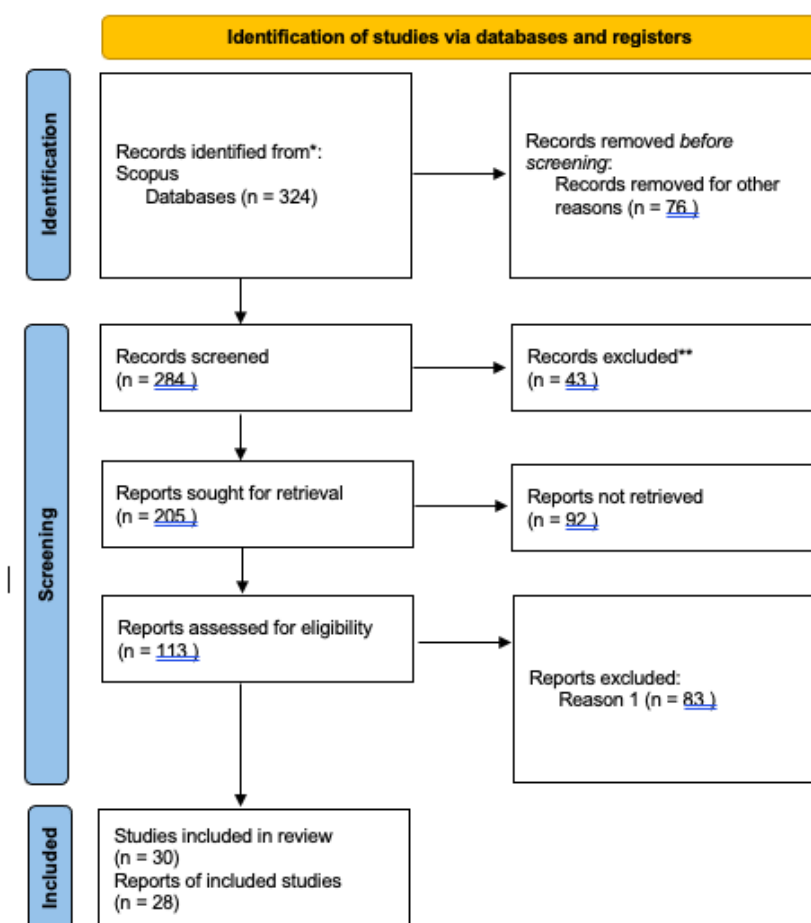
Figure 1. Prisma Diagram

Once the final set of studies was determined, data extraction was carried out using a standardized form designed to capture key study characteristics and findings. Information extracted included authorship, year of publication, country of study, payment methods analyzed, research methodology employed (quantitative, qualitative, or mixed-method), and major findings related to retail performance.

In parallel, a quality assessment was conducted using the Critical Appraisal Skills Programme (CASP) checklist, with each study evaluated based on criteria such as clarity of research aims, validity of methodology, data collection techniques, and transparency in analysis. Only studies rated as medium or high quality were included in the synthesis.

The synthesis of findings employed a narrative approach, given the methodological heterogeneity of the selected studies. The results were organized thematically based on the type of payment technology and its reported impact on retail performance indicators such as operational efficiency, customer satisfaction, and sales outcomes. To complement the narrative synthesis and highlight key thematic trends, a bibliometric analysis was conducted using VOSviewer software. Co-word analysis enabled the visualization of recurring concepts and keyword clusters across the literature, offering a data-driven understanding of prevailing research patterns and conceptual linkages.

This review acknowledges certain limitations. First, publication and language bias may have excluded relevant non-English or non-peer-reviewed studies. Second, the rapid evolution of financial technologies means that some findings, particularly those from earlier years, may not fully reflect current realities. Nonetheless, the systematic and multi-method approach adopted ensures a robust foundation for understanding the relationship between modern payment systems and retail performance.

Ethical standards were upheld throughout the review by ensuring accurate citation of sources and proper acknowledgment of original authors. As the study is based solely on secondary data from publicly available sources, no formal ethical approval was required.

3. RESULTS AND DISCUSSION

The analysis of the selected studies reveals a diverse range of modern payment methods currently implemented in the retail sector. These include mobile wallets such as Apple Pay, GoPay, and Dana; contactless card payments utilizing Near Field Communication (NFC); QR code-based systems; biometric authentication (such as fingerprint and facial recognition); and blockchain-enabled cryptocurrencies. Among these, mobile wallets and QR-based payments were the most prevalent, especially in emerging markets where infrastructural barriers are lower. In contrast, developed markets have seen greater integration of NFC-based systems and biometric methods, often linked with loyalty programs and mobile applications that enhance both transactional convenience and customer engagement. VOSviewer analysis supported this trend, revealing strong keyword associations between mobile payments, convenience, and customer satisfaction.

In terms of retail performance, the adoption of modern payment technologies demonstrated generally positive effects across three key dimensions: sales growth, operational efficiency, and customer satisfaction. Sales improvements were linked to faster, frictionless transactions, which contributed to higher purchase frequency and increased transaction values. This trend was particularly evident during the COVID-19 pandemic when health concerns prompted a shift from cash to contactless options. Operationally, retailers reported benefits such as reduced cash handling, simplified bookkeeping, and better integration with CRM and inventory systems, enabling more responsive and data-driven decision-making. Enhanced customer satisfaction was associated with reduced checkout times, flexible payment options, and the ability to seamlessly integrate loyalty programs with digital wallets—factors that particularly appealed to younger, tech-savvy consumers.

Despite these advantages, the studies also highlighted persistent challenges in implementing these technologies. Technological infrastructure limitations—particularly in regions with low smartphone penetration or weak internet access—posed a barrier to adoption. Additionally, increased digitalization raised concerns regarding cybersecurity and data privacy, prompting the need for significant investment in secure systems and regulatory compliance. Demographic gaps were also notable, as older consumers often lacked the digital literacy or trust required to adopt new payment systems as readily as younger generations. Small and medium-sized enterprises (SMEs) were especially vulnerable to these challenges, facing financial and technical constraints in deploying and maintaining digital payment platforms. These findings emphasize the need for strategic support from both policymakers and technology providers to ensure inclusive and effective adoption of modern payment systems across the retail sector.
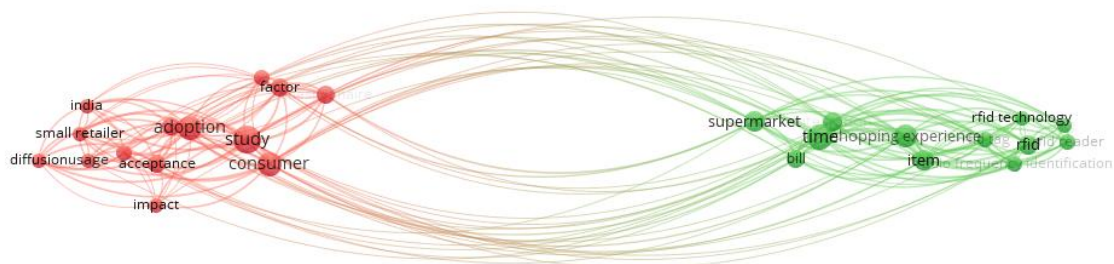
Figure 2. Network Visualization

The overlay visualization created using VOSviewer provides a clear depiction of the thematic structure within the literature on modern payment methods in the retail sector. The analysis identified two main clusters of related keywords, represented in different colors. The red cluster, located on the left side of the map, is composed of terms such as *adoption*, *consumer*, *acceptance*, *factor*, *study*, *diffusion of innovation*, and *India*. This cluster highlights a concentration of research that investigates the behavioral, cultural, and contextual determinants influencing the adoption of modern payment technologies, particularly among small retailers and in developing markets. It suggests that many studies focus on how end-users, especially consumers, perceive and accept emerging payment solutions, with attention to social, economic, and technological factors that facilitate or hinder adoption.

On the other hand, the green cluster, positioned on the right side of the visualization, includes terms such as *RFID*, *shopping experience*, *inventory management*, *supermarket*, *item*, and *bill*. This group reflects a more operational and technology-driven research focus, where modern payment methods are studied in relation to their effects on retail efficiency, customer experience, and supply chain management. Technologies like RFID are examined for their role in streamlining transactions, reducing checkout times, and enhancing inventory control in large-scale retail environments such as supermarkets.

The network of curved and colored lines connecting the two clusters illustrates the interrelatedness of these research areas. There is a notable degree of linkage between consumer-focused adoption studies and technology-focused operational research, indicating that these two perspectives are not mutually exclusive but rather complementary in understanding the broader impact of modern payment systems. The total of 187 links and a link strength of 490 further confirms the interconnected nature of the literature, reinforcing the need for an integrated approach when analyzing the influence of modern payment methods on retail business performance.
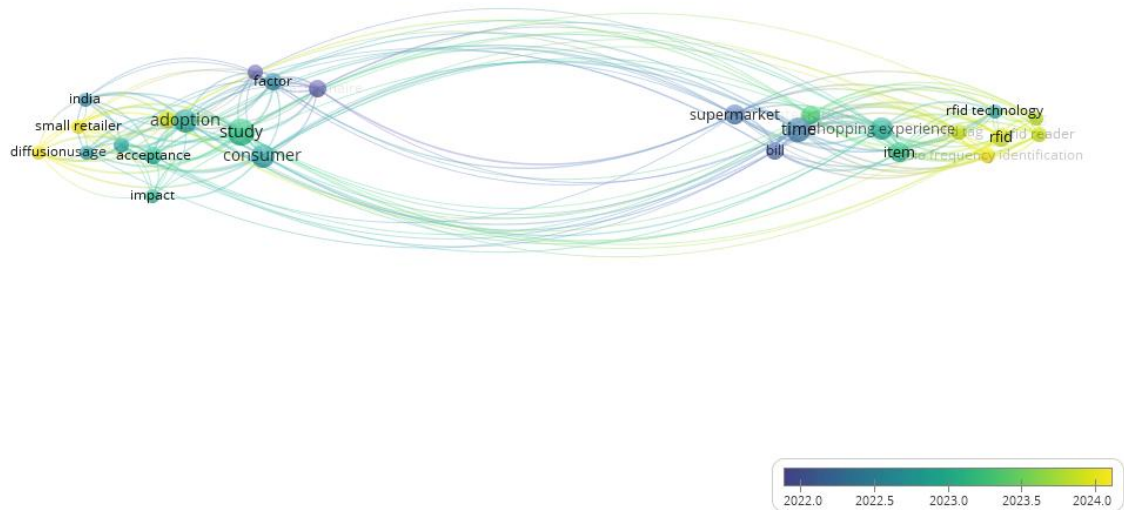
Figure 3. Overlay Visualization

The overlay visualization produced using VOSviewer reveals the temporal progression of research themes related to modern payment methods in the retail sector. The color gradient, ranging from dark blue (older publications around 2022) to yellow (more recent publications closer to 2024), indicates the average publication year of each keyword. Keywords such as adoption, consumer, acceptance, and diffusion of innovation are predominantly shown in darker shades, suggesting these topics were more frequently addressed in earlier studies. These themes reflect a foundational interest in understanding the behavioral and contextual drivers of technology adoption, particularly among small retailers and consumers. In contrast, more recent studies—represented by yellow and green hues—focus on technological and operational aspects, as seen in keywords like RFID, RFID technology, shopping experience, item, and identification. This shift indicates an evolving research interest toward the practical implementation and performance benefits of modern payment technologies, especially in larger retail environments such as supermarkets. The visualization thus demonstrates a clear chronological transition from adoption-focused research toward technology integration and experience enhancement in retail operations. This temporal insight supports the argument that the field is moving from exploratory adoption models toward optimizing and leveraging modern payment systems for improved retail outcomes.
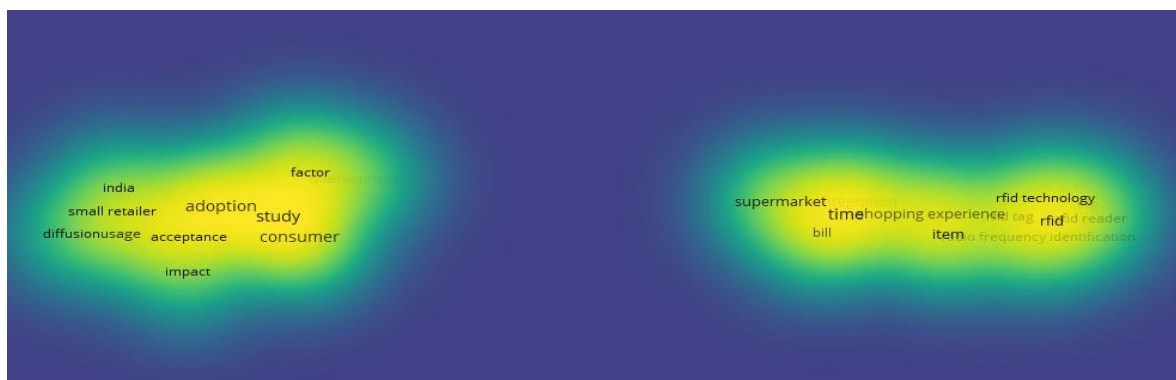

Figure 4. Density Visualization

The density visualization generated using VOSviewer highlights the concentration and prominence of research themes related to modern payment methods in retail, based on keyword frequency. Areas shown in yellow represent high-density regions where keywords appear more frequently in the literature, indicating topics that have received significant academic attention. The left cluster, with dense terms such as *adoption*, *consumer*, *acceptance*, *study*, and *small retailer*, suggests a strong focus on the behavioral and organizational aspects of payment technology adoption, particularly in the context of developing regions like India. This indicates that much of the research has historically examined the factors influencing the willingness and readiness of consumers and small businesses to adopt these technologies. Meanwhile, the right cluster contains frequently occurring keywords such as *RFID technology*, *shopping experience*, *item*, *bill*, and *supermarket*, which reflect a more recent and growing interest in the operational applications and experiential outcomes of implementing modern payment systems. The visual separation of the two clusters suggests a dual thematic emphasis within the field: one rooted in adoption dynamics, and the other in technological integration and performance optimization in larger retail contexts.

4. CONCLUSION

This systematic literature review set out to explore the impact of modern payment methods on retail business performance, specifically examining how innovations such as mobile wallets, contactless systems, QR code payments, biometric authentication, and blockchain-based digital currencies are reshaping the retail landscape. As highlighted in the introduction, these technologies are not merely complementary features but represent a fundamental shift in how retail transactions are conducted. The findings confirm that modern payment systems significantly enhance retail outcomes, particularly in the areas of operational efficiency, sales growth, and customer satisfaction. Retailers who adopt these methods experience shorter transaction times, improved financial and inventory management, and greater customer engagement—especially among younger, digitally native consumers.

However, the benefits of modern payment systems are not evenly distributed across the retail sector. While large retail chains in developed countries are generally equipped to integrate advanced technologies seamlessly, small and medium-sized enterprises (SMEs) in developing regions face substantial barriers. These include limited access to digital infrastructure, high initial investment costs, and a lack of technical expertise. Furthermore, older demographics often resist adopting digital payment systems due to concerns about trust and digital literacy, resulting in a demographic divide that limits full-scale adoption. Concerns regarding cybersecurity, data privacy, and regulatory uncertainty also present ongoing challenges, emphasizing the need for comprehensive and context-sensitive implementation strategies.

To address these challenges, collaboration among stakeholders is essential. Retailers must prioritize both technological investment and human capital development by training staff and educating customers on the use and benefits of digital payments. Technology providers should develop scalable and affordable solutions tailored to the needs of smaller businesses and less tech-savvy users. Meanwhile, policymakers play a critical role in ensuring that regulatory frameworks promote innovation while safeguarding consumer interests. Investments in digital infrastructure and financial literacy programs are also necessary to foster an inclusive retail environment that can support widespread digital payment adoption.

Looking ahead, further research is needed to explore the long-term effects of digital payment systems on customer loyalty, business sustainability, and competitive advantage. Studies focusing on generational and cultural factors influencing payment adoption, as well as the role of fintech collaborations in enabling retail digital transformation, would provide valuable insights. Ultimately, modern payment methods are not just tools for convenience but strategic enablers of resilience and

innovation. Their thoughtful, inclusive, and adaptive implementation will be vital in shaping the future of retail in both physical and digital domains.

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