Digital Payments and Transactions: Analyzing the Growth of Digital Payment Systems and Their Impact on Traditional Banks

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Article Info

P-ISSN: 3051-3502
E-ISSN: 3051-3510
Volume: 07
Issue: 01
Received: 08-11-2025
Accepted: 10-12-2025
Published: 12-01-2026
Page No: 56-61

Abstract
The global financial ecosystem is undergoing an unprecedented structural transformation driven by the rapid proliferation of digital payment systems. This article examines the growth trajectory of digital payment platforms from 2018 to 2024, analyzing key technological, regulatory, and behavioral drivers. Through quantitative data, comparative analysis of leading platforms, and a review of strategic responses from major banking institutions, we demonstrate that digital payments are not merely a supplement to traditional banking but are fundamentally reshaping the competitive landscape, revenue models, and customer relationship paradigms of the global financial sector. Our findings indicate that while traditional banks face existential pressures on fee income and branch relevance, those investing in digital transformation have successfully retained and in some cases expanded their customer bases.

DOI: https://doi.org/10.54660/IJMER.2026.7.1.56-61

Keywords: digital payments, fintech, open banking, mobile wallets, financial disruption, banking transformation

1. Introduction

The way individuals and businesses exchange value has been evolving since the earliest forms of commerce, yet the pace of change observed in the past decade is arguably the most disruptive in the history of banking and finance. Digital payment systems encompassing mobile wallets, real-time bank transfers, contactless card technology, and blockchain-based settlement mechanisms have collectively processed over $7.5 trillion in global transaction volume annually as of 2023, a Fig projected to surpass $11 trillion by 2028.

This growth is not occurring in isolation. It is deeply intertwined with the broader fintech revolution, shifts in consumer expectations shaped by the on-demand economy, post-pandemic behavioral changes, and enabling regulatory frameworks such as the European Union's Revised Payment Services Directive (PSD2) and the United States Federal Reserve's FedNow Service. Together, these forces have created a permissive environment in which non-bank technology firms can access financial infrastructure, compete for payment flows, and build customer loyalty at a fraction of the cost traditionally associated with banking.

For traditional financial institutions commercial banks, savings institutions, and credit unions this represents a dual challenge: the erosion of fee-based revenues historically generated from payment services, and the risk of disintermediation from the end customer relationship. Yet the story is not uniformly negative for incumbents. Banks with robust digital investment strategies have demonstrated that agility, brand trust, and existing balance sheet strength can be leveraged to coexist with, and even benefit from, the fintech ecosystem.

This article proceeds as follows: Section 2 surveys the landscape of digital payment systems and their growth drivers. Section 3 presents empirical data on market size and platform competition. Section 4 analyzes the impact on traditional banks across revenue, operations, and strategy. Section 5 examines case studies of bank adaptation. Section 6 addresses emerging technologies

reshaping the field. Section 7 offers a forward-looking outlook, and Section 8 concludes with policy and strategic implications.

2. The Digital Payments Ecosystem

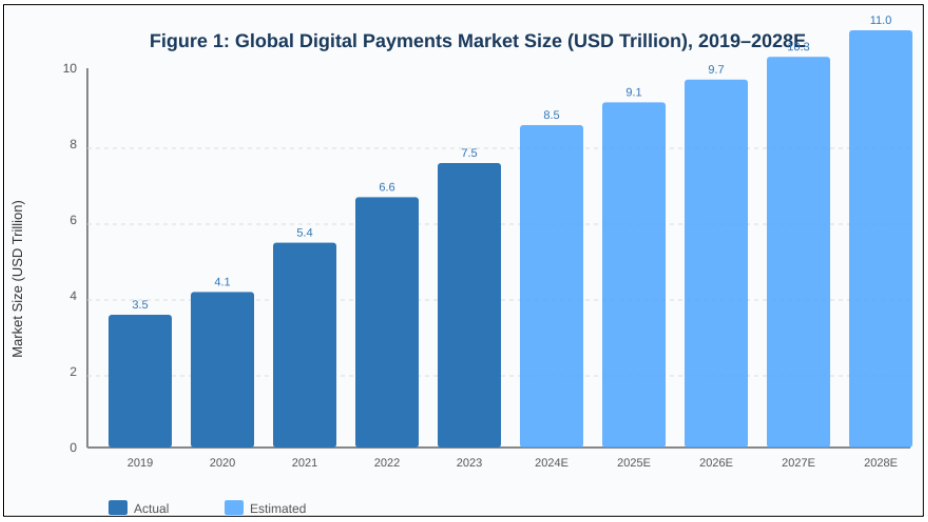
2.1. Definition and Taxonomy

Digital payments encompass any transaction initiated, processed, or settled through electronic channels without the physical exchange of currency or paper instruments. The taxonomy is broad: card-based payments (credit, debit, prepaid), mobile wallets (Apple Pay, Google Pay, Samsung Pay), real-time payment systems (UPI in India, SEPA Instant in Europe, RTP in the US), peer-to-peer (P2P) platforms (Venmo, Zelle, PayPal), account-to-account (A2A) transfers, Buy Now Pay Later (BNPL) schemes, and emerging crypto-asset payment rails each represent distinct modalities with different technical architectures, regulatory treatments, and user demographics.

2.2. Key Growth Drivers

The surge in digital payment adoption is attributable to several compounding factors. First, smartphone penetration has reached approximately 6.8 billion devices globally in 2024, making mobile-native financial services accessible to populations previously excluded from formal banking. Second, the COVID-19 pandemic served as a structural inflection point: contactless payment usage increased by over 150% between Q1 2020 and Q3 2021 across Europe and North America, as health-conscious consumers and merchants shifted away from cash handling. Third, regulatory innovation has played a decisive role open banking mandates in the UK, the EU, Brazil, and Australia have compelled banks to expose application programming interfaces (APIs) that allow third-party fintech firms to build payment products on top of existing account infrastructure.

Fourth, the network effects inherent to payment platforms where value increases exponentially with each additional participant have allowed dominant platforms like Alipay and WeChat Pay to achieve near-ubiquitous penetration within their core markets. Fifth, the declining cost of digital infrastructure, coupled with cloud computing and serverless architectures, has reduced the barriers to entry for new payment service providers, intensifying competition and accelerating innovation cycles.



Source: Industry Reports & Analyst Estimates.

Fig 1: Global Digital Payments Market Size (USD Trillion), 2019–2028 Estimated

3. Market Size, Growth, and Platform Landscape

3.1. Market Trajectory

As illustrated in Fig 1, the global digital payments market has grown from approximately USD 3.5 trillion in 2019 to USD 7.5 trillion in 2023, representing a compound annual growth rate (CAGR) of approximately 21%. This growth has been driven disproportionately by Asia-Pacific markets, where China alone accounts for an estimated 45% of global mobile payment volume, primarily through Alipay and WeChat Pay. North America and Europe have seen strong growth in real-time payment adoption and BNPL services, while Africa and South Asia have led in mobile money innovation for unbanked populations.

Industry consensus forecasts project continued double-digit growth through 2028, with the market expected to cross USD 11 trillion. Key growth areas include cross-border remittances a segment where digital challengers have dramatically undercut traditional bank wire fees and B2B payments, which represent the largest untapped opportunity in the digital payments space, with an estimated USD 120 trillion in annual global B2B flows still predominantly conducted through legacy systems.

Table 1: Key Milestones in the Evolution of Digital Payment Systems

Year	Milestone	Impact
1994	First online bank (Stanford FCU)	Pioneered internet-based retail banking services
2007	M-Pesa mobile money launch (Kenya)	Demonstrated mobile payments viability in unbanked markets
2009	Bitcoin whitepaper & blockchain	Introduced decentralized currency concept; challenged fiat dominance
2014	Apple Pay launch	Mainstream NFC contactless payments; shifted consumer behavior at POS
2015	EU PSD2 Directive enacted	Mandated open banking APIs; enabled third-party financial services
2020	COVID-19 accelerates cashless shift	Digital payment volumes surged 40%+ globally within 12 months
2022	FedNow instant payments (announced)	Spurred U.S. real-time payment infrastructure development
2024	AI-powered fraud detection widespread	Reduced fraud losses by ~35%; improved transaction authentication

3.2. Competitive Platform Landscape

The digital payments space is characterized by significant market concentration at the platform level, yet intense competition at the product and feature level. Table 2 provides a comparative overview of leading global platforms, revealing the diversity of business models and scale achieved within a relatively short time frame. Notably, Chinese super-apps Alipay and WeChat Pay operate at a scale that dwarfs their Western counterparts, reflecting the unique structural conditions of China's digital economy where payment functionality is embedded within broader lifestyle applications.

In Western markets, Stripe has emerged as the dominant infrastructure provider, processing an estimated USD 1 trillion in 2024 and powering payment operations for over one million businesses. PayPal's two-sided network serving both consumers and merchants retains competitive relevance despite newer entrants. The BNPL segment, led by Klarna, Afterpay (now Block), and affirm, has introduced credit-like functionality into the payment flow, competing directly with bank-issued revolving credit products.

Table 2: Leading Global Digital Payment Platforms – Comparative Overview (2024)

Platform	Founded	2024 Users	GMV (USD)	Key Differentiator
PayPal	1998	435 million	$1.53T	First-mover advantage; extensive merchant integrations
Alipay	2004	1.3 billion	$17T+	Super-app ecosystem; dominant in China and SE Asia
WeChat Pay	2013	900 million	$12T+	Social media-integrated payments; viral network effects
Stripe	2010	N/A (B2B)	$1.0T	Developer-first APIs; powers 50%+ of internet businesses
Square/Block	2009	57 million	$200B+	SMB-focused POS + Cash App consumer wallet
Google Pay	2015	150 million	$110B+	Android ecosystem synergy; AI-enhanced spending insights

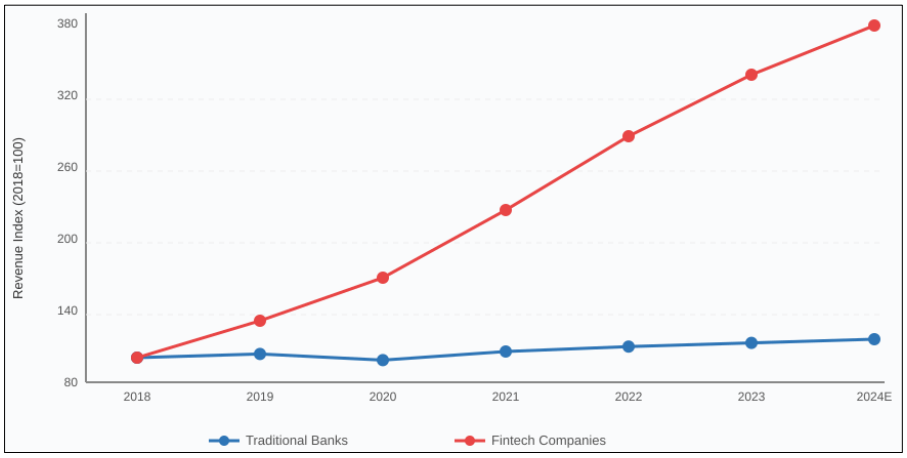


Fig 2: Traditional Bank vs. Fintech Revenue Growth Index (2018 = 100)

Illustrates the diverging trajectories of established banks and fintech challengers over a six-year period.

4. Impact on Traditional Banks

4.1. Revenue Disruption

As Fig 2 illustrates, while traditional bank revenue growth has been largely stagnant on an indexed basis (rising from 100 to approximately 115 between 2018 and 2024), fintech company revenue has grown by an estimated factor of 3.7× over the same period. This divergence reflects the reallocation of payment economics from banks to technology intermediaries. Specifically, three revenue streams have been meaningfully impacted: payment processing fees (where banks previously captured interchange and wire revenues), overdraft and credit fees (disrupted by BNPL and challenger bank products), and foreign exchange spreads on international transfers (compressed by fintechs like Wise and Revolut offering near-interbank rates).

According to McKinsey Global Institute estimates, global banks collectively lost approximately USD 280 billion in payment-related revenues to fintech competitors between 2018 and 2023 representing roughly 8% of total banking revenue globally. Non-interest income as a percentage of bank revenue has declined from approximately 28% in 2018 to an estimated 20% by 2024, in large part due to fee compression in payment services.

4.2. Operational and Structural Impact

Beyond direct revenue effects, digital payments have driven significant operational restructuring in the banking sector.

The most visible manifestation is the accelerating decline of physical branch networks. As shown in Table 3 and Fig 4, the number of bank branches in the United States has declined from approximately 88,000 in 2018 to an estimated 58,000 in 2024 a reduction of over 34% driven by declining transactional foot traffic as customers migrate to digital channels for routine services. Simultaneously, global digital banking users have grown from 1.2 billion in 2018 to an estimated 3.8 billion by 2024.

The operational implications are twofold. On one hand, branch rationalization delivers significant cost savings branches represent the largest single cost center for retail banks. On the other hand, the transition requires substantial capital investment in digital infrastructure, cybersecurity, and data analytics capabilities. Banks are effectively engaged in a decade-long capital rotation from physical to digital assets, the return profile of which remains uncertain but is increasingly supported by the data from early adopters.

Table 3: Impact Metrics – Traditional Banking Sector, 2018–2024

Metric	2018	2021	2024E	Trend
US Bank Branch Count	88,000	72,000	58,000	▼ Declining
Global Digital Banking Users	1.2 billion	2.6 billion	3.8 billion	▲ Rising
Bank Wire Transfer Fee (avg. USD)	$27.50	$22.10	$16.80	▼ Declining
Fintech Investment (USD billion)	$32B	$131B	$98B	● Stable
Bank Non-Interest Income Share (%)	28%	24%	20%	▼ Declining
Mobile Banking Adoption Rate (%)	41%	63%	79%	▲ Rising

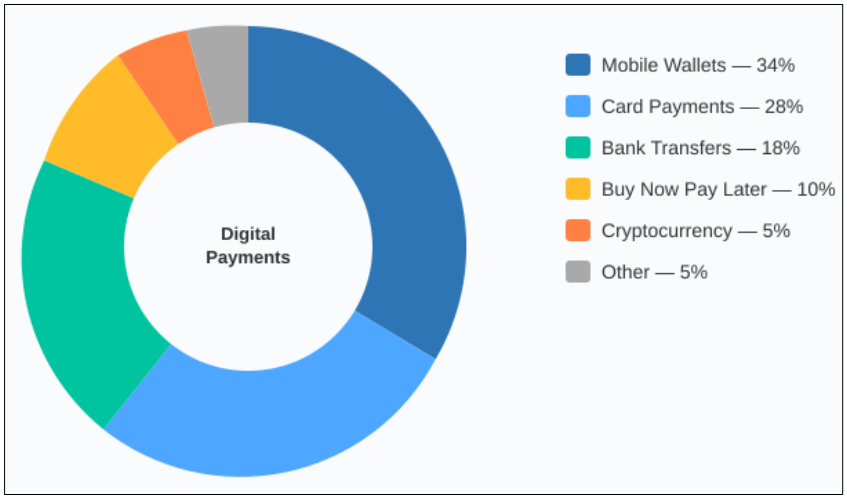


Fig 3: Global Digital Payment Methods Market Share by Transaction Volume (2024)

Mobile wallets now represent the single largest payment modality globally.

4.3. Customer Relationship Dynamics

Perhaps the most strategically consequential impact of digital payments is the potential for disintermediation from the customer relationship. When consumers primarily interact with their finances through a fintech app rather than a bank interface, the bank risks becoming an invisible utility a balance sheet provider whose brand and relationship assets are eroded. This dynamic is particularly acute for younger demographics: surveys consistently indicate that consumers aged 18–34 are significantly more likely to identify a technology company (Apple, Google, PayPal) as their primary financial services provider than a traditional bank.

The aggregation threat is magnified by open banking regulation. When banks are required to share customer transaction data with licensed third parties (with customer consent), they risk losing the data advantage that has historically underpinned cross-sell and up-sell capabilities. A fintech aggregator with access to a customer's full banking picture across multiple institutions is, paradoxically, better positioned to offer personalized financial advice than the individual banks contributing that data.

5. Strategic Responses by Traditional Banks

5.1. Digital Transformation Initiatives

The banking sector's response to digital payment disruption has not been passive. As documented in Table 4, leading institutions globally have pursued a range of strategic responses from building proprietary digital banking platforms to acquiring fintech firms, establishing innovation labs, and forming strategic partnerships with technology companies. These responses can be broadly categorized into three archetypes: the Integrator (banks that embed digital payment capabilities into their existing products), the Collaborator (banks that partner with or invest in fintech firms through open banking APIs and accelerator programs), and the Transformer (banks that undertake comprehensive digital reinvention of their operating models).

Table 4: Strategic Digital Payment Responses by Major Global Banks

Institution	Initiative	Year Launched	Outcome / Result
JPMorgan Chase	Chase Pay / QuickPay	2015 / 2012	Over 70M active digital users; $10B+ in digital investments since 2020
Goldman Sachs	Marcus (digital bank)	2016	$120B+ deposits; pivoted to B2B after retail challenges in 2023
BBVA	Open API platform	2017	60+ fintech partners; digital sales exceeding 70% of total new products
DBS Bank	DBS Digibank	2016	Ranked #1 World's Best Digital Bank (Euromoney 2023); 7M digital users
Citi	CitiDirect / TTS API	2018	Processed $4T+ in real-time global transactions; key institutional payment hub
ING Group	Yolt (fintech spin-out)	2017	Validated open-banking model; technology licensed to financial institutions

5.2. The DBS Model: A Blueprint for Digital Transformation

Among the clearest illustrations of successful bank digital transformation is DBS Bank of Singapore, which has invested over USD 4 billion in digital infrastructure since 2014 and was recognized by Euromoney as the World's Best Digital Bank for multiple consecutive years. DBS's approach which it describes as running a technology company with a banking license prioritizes API-first architecture, agile development practices, and a data-driven customer experience. Its Digibank product, launched initially in India and Indonesia, operates at a cost-to-serve approximately 80% lower than a traditional branch-based model, demonstrating that digital banking is not merely a distribution strategy but a fundamentally different economic proposition.

The critical lessons from the DBS model are its emphasis on cultural transformation (not merely technology deployment), its willingness to cannibalize existing revenue streams before competitors do, and its use of the platform model to generate ecosystem revenues beyond traditional banking products. These principles are increasingly being adopted with varying degrees of commitment by banks globally.

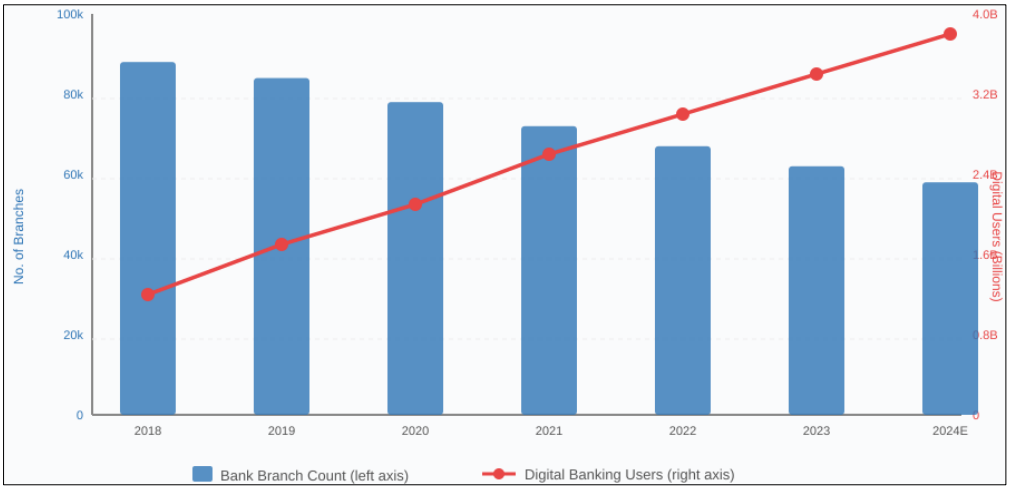


Fig 4: Bank Branch Count vs. Digital Banking Users (2018–2024)

The inverse relationship reflects the structural shift from physical to digital financial service delivery.

6. Emerging Technologies Reshaping Digital Payments

6.1. Artificial Intelligence and Machine Learning

Artificial intelligence is transforming digital payments across three primary dimensions: fraud prevention, credit underwriting, and personalization. AI-powered fraud detection systems now analyze thousands of behavioral and contextual variables per transaction in real time, achieving false positive rates that are an order of magnitude lower than rule-based legacy systems. Machine learning credit models have enabled fintechs and challenger banks to extend credit to previously underserved populations by leveraging alternative data sources utility payments, rental history, mobile phone usage that traditional credit scoring ignores. Personalization engines are enabling hyper-relevant financial product recommendations, improving conversion rates and customer satisfaction simultaneously.

6.2. Central Bank Digital Currencies (CBDCs)

The emergence of Central Bank Digital Currencies represents perhaps the most structurally significant development on the horizon for the digital payments landscape. Over 130 countries are actively researching or piloting CBDCs as of 2024, with China's digital yuan (e-CNY) being the most advanced large-scale deployment. CBDCs have the potential to create government-sponsored payment rails that bypass commercial bank intermediation entirely, raising profound questions about the future role of commercial banks in the payment system. The Bank for International Settlements (BIS) has identified CBDC design choices particularly whether CBDCs bear interest and how they are distributed as critical determinants of their impact on banking system stability and credit creation capacity.

6.3. Blockchain and Programmable Payments

Beyond cryptocurrency speculation, blockchain technology offers substantive utility in cross-border payment settlement, trade finance, and programmable smart contract-based transactions. Ripple's XRP Ledger and JPMorgan's Onyx platform (which has processed over USD 700 billion in repo and cross-border transactions) demonstrate enterprise-grade applications of distributed ledger technology that are improving settlement speed and reducing counterparty risk in wholesale financial markets. As these technologies mature, they are likely to further compress the economics of cross-border payments a segment where traditional banks have

historically extracted significant fee revenues from information asymmetry and correspondent banking relationships.

7. Outlook: The Future of Payments and Banking

Looking to the decade ahead, several convergent trends point toward a payments landscape that is faster, cheaper, more interconnected, and more intensely competitive than today. Real-time payment infrastructure is being built or expanded in virtually every major economy, reducing settlement times from days to seconds for domestic transfers and, increasingly, for cross-border flows. The rise of embedded finance whereby payment and lending functionality is integrated directly into non-financial consumer and business platforms will further blur the boundaries between banks, fintechs, and technology companies.

The consolidation phase in fintech, visible in the declining global fintech investment Figs from the 2021 peak of USD 131 billion to approximately USD 98 billion in 2024, suggests that the sector is maturing. Scale advantages are becoming more decisive, and a smaller number of well-capitalized platforms are likely to dominate payment flows globally. For traditional banks, the strategic window for transformation is narrowing those that have not yet made decisive digital investments face the risk of being relegated to regulated utility status, with competitive advantage residing entirely in balance sheet capacity rather than customer relationships or payment economics.

Regulatory developments will also play a decisive role. The global movement toward open banking, mandatory interoperability standards, and heightened data privacy regulation (GDPR in Europe, emerging frameworks in the US and Asia) will shape the competitive boundaries between banks and fintechs. Regulators are increasingly being asked to balance innovation-enabling frameworks against systemic risk concerns, particularly as non-bank payment firms achieve systemically important scale without being subject to bank-equivalent prudential supervision.

8. Conclusions and Implications

The growth of digital payment systems constitutes one of the most profound structural shifts in the history of financial services. From a USD 3.5 trillion market in 2019 to a projected USD 11 trillion by 2028, digital payments have moved from a niche innovation to the dominant paradigm for value exchange in the global economy. This transformation has been powered by smartphone adoption, regulatory enablement, behavioral shifts accelerated by the pandemic, and the relentless competitive pressure of technology-native financial services firms.

For traditional banks, the implications are simultaneously threatening and opportunistic. The erosion of payment fee income, the rationalization of branch networks, and the risk of disintermediation from the customer relationship represent genuine structural challenges. Yet banks retain significant advantages: regulatory licenses that confer unique capabilities in credit creation and deposit insurance, deep customer trust relationships, existing balance sheet scale, and increasingly, the capital to invest in digital transformation. The bifurcation between banks that are embracing this transformation and those that are deferring it is becoming increasingly stark in financial performance data.

The policy implications are equally significant. Regulators face the challenge of enabling the efficiency and inclusion benefits of digital payments while safeguarding financial stability, protecting consumer data, and ensuring that the competitive landscape remains contestable. The choices made in the next five years around CBDC design, open banking implementation, and the regulatory treatment of non-bank payment providers will shape the structure of the global financial system for a generation.

In conclusion, digital payments are not merely a technological evolution in the mechanics of transaction processing. They represent a fundamental reorganization of the economics, relationships, and power dynamics of financial services. For all participants banks, fintechs, regulators, and consumers understanding and adapting to this transformation is not optional. It is existential.

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How to Cite This Article

Oyedeji MA, Fatogun A, Umealajekwu C. Digital payments and transactions: analyzing the growth of digital payment systems and their impact on traditional banks. International Journal of Multidisciplinary Evolutionary Research. 2026;7(1):56–61. doi:10.54660/IJMER.2026.7.1.56-61.

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