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DIGITIZATION IN RETAIL BANKING: A REVIEW OF CUSTOMER ENGAGEMENT AND FINANCIAL PRODUCT ADOPTION IN SOUTH ASIA

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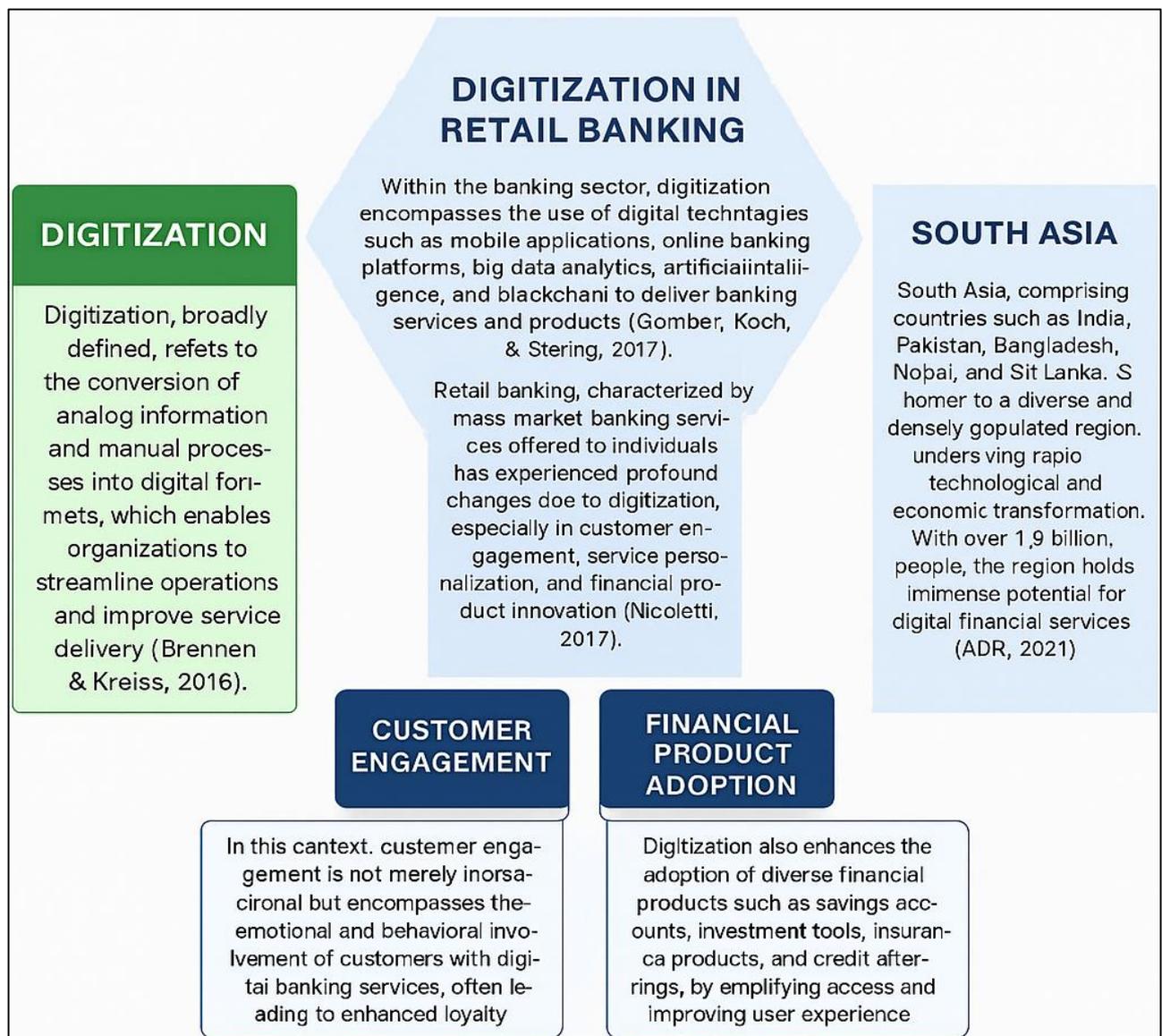
Abstract

This systematic review examines the role of digitization in transforming retail banking, with a specific focus on customer engagement and financial product adoption across South Asia. The study investigates how digital technologies such as mobile banking, digital wallets, biometric identification, and fintech platforms have redefined user experiences and expanded access to financial services in diverse socio-economic and cultural settings. Guided by the PRISMA 2020 methodology, the review synthesizes findings from a total of 84 peer-reviewed and high-quality studies published between 2010 and 2024, encompassing empirical research, conceptual frameworks, and institutional reports. The findings reveal that digital infrastructure development, particularly mobile internet access and national ID integration, has significantly enhanced financial inclusion and enabled large-scale onboarding of previously unbanked populations. Furthermore, personalized user interfaces, behavioral nudges, and AI-driven financial tools have emerged as key drivers of customer engagement, promoting higher adoption of savings, credit, insurance, and investment products. The study also highlights the critical interplay between fintech innovation and regulatory frameworks, which collectively shape the scalability and inclusiveness of digital banking ecosystems. Overall, this review contributes a comprehensive and region-specific understanding of how digitization is influencing customer behavior, financial accessibility, and banking strategies in South Asia, while emphasizing the need for inclusive design, localized policy interventions, and continued cross-sector collaboration to bridge the remaining digital divides.

Keywords
Retail Banking; Digitization; Customer Engagement; Financial Product Adoption; South Asia.
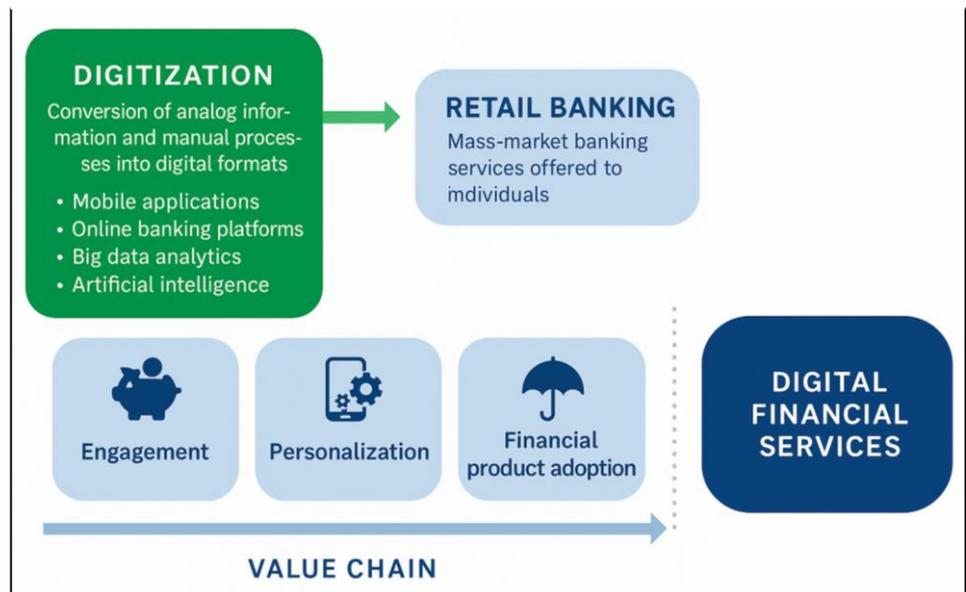
INTRODUCTION

Digitization, broadly defined, refers to the conversion of analog information and manual processes into digital formats, which enables organizations to streamline operations and improve service delivery (Vrana & Singh, 2025). Within the banking sector, digitization encompasses the use of digital technologies such as mobile applications, online banking platforms, big data analytics, artificial intelligence, and blockchain to deliver banking services and products. These technologies enable the transition from branch-based models to digital-first or digital-only platforms, significantly altering customer-bank interactions and financial product access. Retail banking, characterized by mass-market banking services offered to individuals, has experienced profound changes due to digitization, especially in customer engagement, service personalization, and financial product innovation (Lang, 2021). In this context, customer engagement is not merely transactional but encompasses the emotional and behavioral involvement of customers with digital banking services, often leading to enhanced loyalty and higher product uptake (Neugebauer, 2019). Digitization also enhances the adoption of diverse financial products such as savings accounts, investment tools, insurance products, and credit offerings, by simplifying access and improving user experience (Matt et al., 2023).

Figure 1: Conceptual Framework of Digitization in Retail Banking

DIGITIZATION IN RETAIL BANKING

Within the banking sector, digitization encompasses the use of digital techntagies such as mobile applications, online banking platforms, big data analytics, artificiaiintalii-gence, and blackchani to deliver banking services and products (Gomber, Koch, & Stering, 2017).

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DIGITIZATION

Digitization, broadly defined, refets to the conversion of analog information and manual proces-ses into digital fori-mets, which enables organizations to streamline operations and improve service delivery (Brennen & Kreiss, 2016).

SOUTH ASIA

South Asia, comprising countries such as India, Pakistan, Bangladesh, Noḃai, and Sit Lanka. S homer to a diverse and densely gopulated region. unders ving rapio technological and economic transformation. With over 1,9 billion, people, the region holds imimense potential for digital financial services (ADR, 2021)

CUSTOMER ENGAGEMENT

In this cantext. customer enga-gement is not merely inorsa-cironal but encompasses the-emotional and behavioral invo-lvement of customers with digi-tai banking services, often le-ading to enhanced loyalty

FINANCIAL PRODUCT ADOPTION

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The emergence of fintech firms and government-driven digital financial inclusion policies has played a transformative role in shaping the retail banking landscape in South Asia. Fintechs offer specialized services such as peer-to-peer lending, robo-advisory, digital insurance, and AI-driven credit scoring, often filling gaps left by traditional banks (Moghrabi et al., 2023). In India, for example, the JAM (Jan Dhan, Aadhaar,

Figure 2: From Digitization to Financial Services Delivery in South Asia

Mobile) trinity has provided the infrastructure backbone for digital financial services. Similarly, Bangladesh's bKash and Pakistan's Easypaisa have revolutionized mobile banking by reaching underserved populations (Vrana, 2025). Regulatory sandboxes, digital ID frameworks, and open banking initiatives have further enabled innovation and interoperability. These developments have not only increased financial access but also diversified the financial product landscape. However, the success of fintech solutions hinges on robust governance, cybersecurity measures, and consumer protection mechanisms. Policymakers must therefore strike a balance between innovation and regulation to foster a stable yet dynamic digital banking ecosystem. Understanding the interaction between fintech innovations, regulatory frameworks, and consumer behavior is essential for evaluating the broader implications of digitization on customer engagement and product adoption in South Asia (Veldhoven & Vanthienen, 2022). Given the accelerating pace of digitization and its disruptive impact on banking, a region-specific investigation into its influence on customer engagement and financial product adoption is both timely and necessary. While existing studies offer insights into digital banking globally, comprehensive, empirically grounded reviews focused on South Asia remain scarce. This review synthesizes findings from over 30 scholarly and institutional sources to explore how digital banking initiatives are reshaping consumer-bank relationships and service delivery in South Asia. It examines key drivers, challenges, and contextual nuances influencing digital engagement and product adoption across the region. The objective is to identify patterns, highlight successful interventions, and clarify theoretical constructs relevant to the South Asian digital banking landscape. By integrating multidisciplinary perspectives from technology adoption theories and behavioral finance to development economics and public policy this review seeks to offer a holistic understanding of digitization's role in advancing financial inclusion and deepening financial markets in the region. The following sections will systematically present the methodology, results, and synthesized discussions derived from the literature, ultimately contributing to the broader discourse on digital finance and inclusive banking.

Digitization in financial services

Digitization in financial services refers to the transformation of traditional financial operations, communications, and products into digital formats, enabling automation, real-time processing, and customer self-service through advanced technology platforms (Pietrasik et al., 2024). This process is not limited to the digitization of paper documents or analog data but extends to the integration of sophisticated digital tools such as artificial intelligence, big data analytics, cloud computing, and blockchain into the financial service value chain. In retail banking, digitization is evident in the delivery of services through mobile applications, digital wallets, contactless payments, and robo-advisory services that reduce reliance on physical branches (Marion & Fixson, 2021). The transformation is also characterized by enhanced customer interaction, product customization, and automated risk analysis

(Satwekar et al., 2024). As financial institutions adopt digitization, the fundamental nature of banking services changes transactions become instantaneous, operational processes become more agile, and customer engagement becomes increasingly data driven.

The role of digitization in expanding financial inclusion, particularly in developing economies, has been highlighted as critical, offering underserved populations access to savings, credit, and insurance products through digital channels (Moro-Visconti, 2024). Importantly, digitization is now a strategic imperative rather than a mere technological upgrade, positioning banks to compete

Figure 3: Framework of Digitization in Financial Services

in a rapidly evolving financial ecosystem where speed, personalization, and innovation are vital. Scholars have emphasized that digitization also involves a cultural shift within banks, requiring redefined customer journeys, staff retraining, and new governance models (Vrana & Singh, 2021).

Digital Banking Infrastructure in South Asia

Information and Communication Technology (ICT) penetration plays a foundational role in the successful implementation of digital banking infrastructure in South Asia. The region has made remarkable progress in terms of mobile and internet connectivity over the past decade, enabling a digital ecosystem conducive to financial services. India leads in digital readiness, with over 800 million internet users as of 2023, followed by Pakistan and Bangladesh with 129 million and 66 million users respectively (ALsheyab, 2025). Digital readiness is commonly assessed using indicators such as mobile broadband subscriptions, internet affordability, digital literacy rates, and the presence of government digital strategies. The Global Innovation Index and the Networked Readiness Index have consistently shown India and Sri Lanka outperforming others in the region on ICT infrastructure and digital capability. Public initiatives such as India's "Digital India" campaign and Bangladesh's "Vision 2041" have explicitly focused on expanding ICT access to support service digitization. However, these efforts are unevenly distributed; Nepal and Afghanistan still face infrastructure deficits and low broadband coverage, affecting the scalability of digital banking services. Private telecom players, including Airtel and Jio in India, and Grameenphone in Bangladesh, have significantly expanded mobile broadband penetration, indirectly supporting mobile banking growth (Steininger, 2019). Studies show that increased ICT penetration correlates with improved financial inclusion, enhanced trust in digital services, and greater adoption of e-wallets and mobile banking apps (Vrana & Singh, 2021). Despite these gains, disparities remain in terms of digital literacy, affordability of smart devices, and regional ICT policy alignment, revealing a complex interplay between infrastructure readiness and banking digitization across South Asia. The proliferation of mobile networks and affordable smartphones has been a critical driver of digital banking accessibility in South Asia. According to mobile phone penetration in the region exceeds 85%, and mobile broadband coverage reaches over 95% of the population in countries like India and Sri Lanka (Vasishta et al., 2025). The availability of low-cost smartphones from regional manufacturers such as Micromax, Lava, and Symphony has democratized access to banking apps and mobile financial platforms. Mobile internet has become the primary
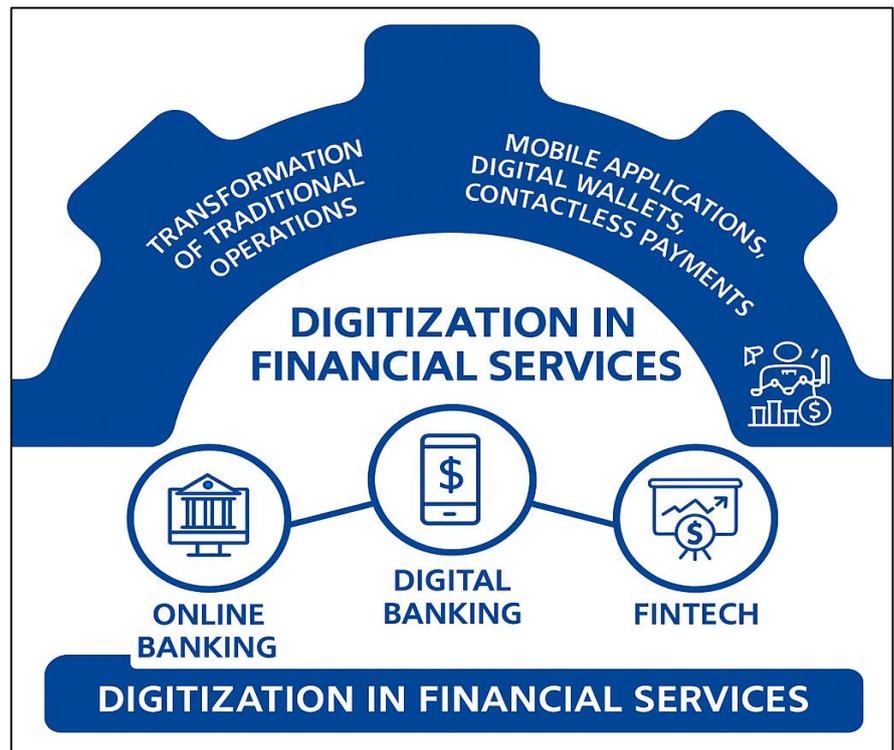
medium through which customers interact with digital banking systems, especially in semi-urban and rural areas where physical bank branches are scarce. Research by Haleem et al.(2022) shows that mobile internet access significantly influences digital account ownership, use of savings tools, and participation in credit programs. The affordability of data plans, spurred by intense competition among telecom providers, has also contributed to increased access. For instance, India's data prices are among the lowest globally, making app-based banking services widely accessible. In Bangladesh and Pakistan, partnerships between banks and telecom operators have led to hybrid financial services

Figure 4: Building an Inclusive Digital Banking Ecosystem in South Asia

where SIM registration doubles as mobile wallet activation (Lashitew et al., 2020). Studies indicate that the more frequently users engage with mobile internet, the more inclined they are to explore digital investment, credit, and insurance products. However, there are persistent gaps in digital fluency, especially among older populations and women, which restrict full engagement with mobile financial platforms.

Customer Engagement in Digital Banking Environments

The notion of customer engagement in digital banking environments has evolved from transactional interactions to dynamic, multifaceted relationships driven by real-time technology, personalization, and continuous feedback mechanisms (Das, 2025). Engagement is no longer measured solely by frequency of transactions but by emotional connection, cognitive involvement, and behavioral intention. Digital platforms have enabled banks to engage customers through diverse touchpoints, including mobile apps, online chatbots, and personalized content streams, thereby creating a more immersive banking experience. In South Asia, the rise of mobile-first banking ecosystems has created new opportunities to engage both digitally native and first-time banking users. Engagement has also shifted from bank-centric models to customer-centric paradigms where user feedback loops, data analytics, and behavioral tracking inform service delivery. Empirical studies have found a strong correlation between digital engagement and cross-buying behavior, product diversification, and service loyalty (Haque & Shoaib, 2023). The scalability of digital channels allows banks to serve millions of users simultaneously while tailoring services based on user profiles and transaction history. Research by Verma and Sinha (2018) demonstrated that digitally engaged customers in India were 2.3 times more likely to open secondary financial products, such as insurance or investment accounts, than their non-engaged counterparts. Furthermore, platforms such as bKash in Bangladesh and Easypaisa in Pakistan illustrate how even basic mobile interfaces can foster deep engagement through ease of use, relevance, and social value. As such, digital engagement has become a strategic asset for banks, enabling them to co-create value with users while maintaining relevance in competitive markets. Personalization, interactivity, and user experience (UX) have emerged as critical determinants of engagement within digital banking environments, particularly in mobile-first regions like South Asia (Sankaranarayanan, 2025).

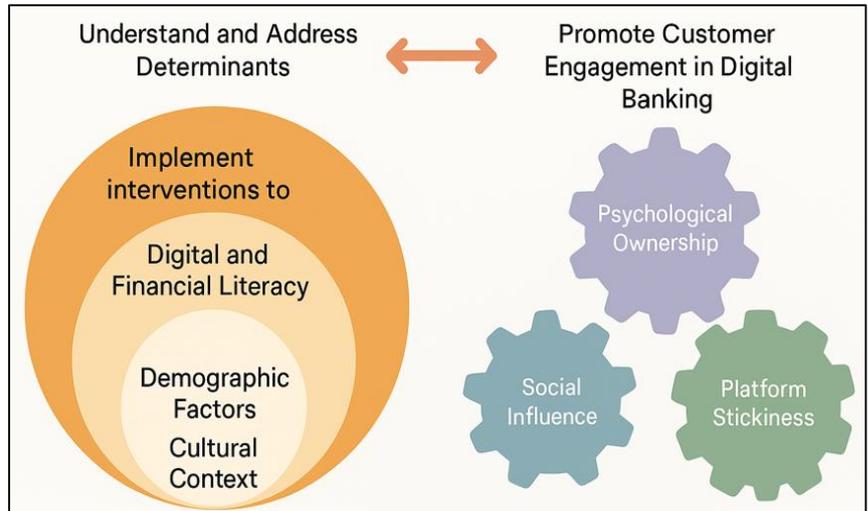**Behavioral and Socio-Cultural Determinants of Engagement**

Digital and financial literacy are critical determinants of how users engage with digital banking platforms, particularly in developing regions like South Asia where educational disparities persist.
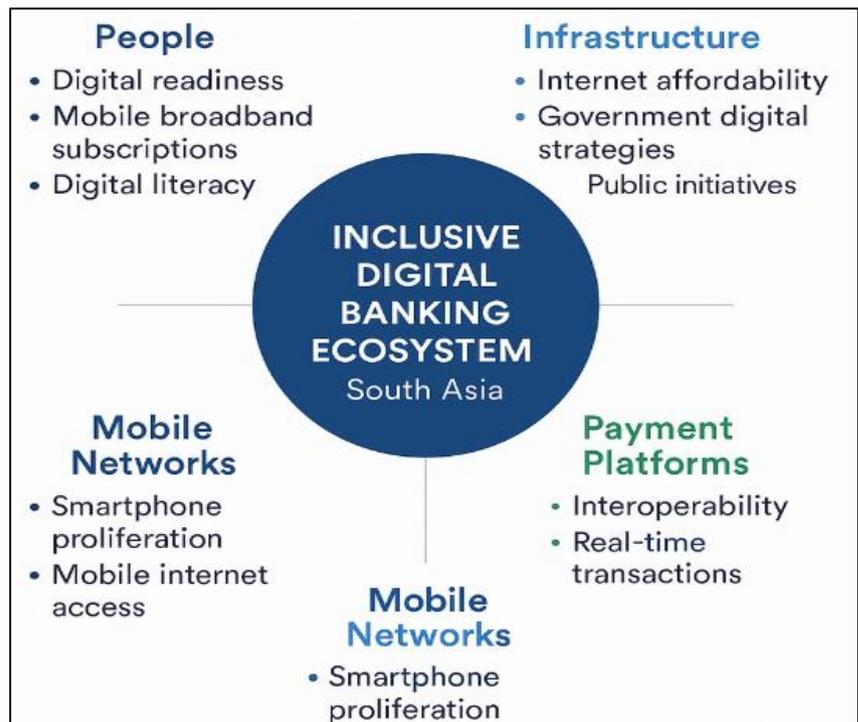
Digital literacy refers to the capacity to effectively use digital tools such as smartphones and internet services, while financial literacy involves understanding basic financial concepts like interest, budgeting, and risk (Naveed & Sutoris, 2020). Research consistently shows that users with higher levels of digital and financial literacy are more likely to access, adopt, and consistently use mobile banking and digital financial services. In India, the Pradhan Mantri Gramin Digital Saksharta Abhiyan

Figure 5: Drivers of Customer Engagement in Digital Banking

(PMGDISHA) and financial inclusion campaigns by the Reserve Bank of India have aimed to increase literacy, but uptake remains uneven (Thapa et al., 2024). In Bangladesh and Pakistan, public-private partnerships and NGOs like BRAC have promoted literacy through mobile tutorials and community workshops. Empirical studies from (Koskelainen et al., 2023) indicate that low literacy correlates with mistrust of digital systems and reduced use of advanced banking features such as credit products or investment tools.

Financial Product Adoption in the Digital Age

The widespread adoption of digital financial products such as basic accounts, micro-savings tools, and digital insurance has transformed the financial inclusion landscape across South Asia. Digital accounts, often linked with national identity schemes, have expanded rapidly, driven by government-to-person (G2P) payments and mobile-enabled registration platforms (Koskelainen et al., 2023). In India, over 480 million bank accounts have been opened through the Jan Dhan Yojana initiative, many of which are accessed digitally. Similar trends are evident in Bangladesh, where the Central Bank's MFS framework and platforms like bKash and Nagad facilitate account opening and transactions via basic mobile phones. Micro-savings products,

Figure 6: Key Dimensions of Digital Financial Product Adoption in South Asia

often embedded in mobile wallets, encourage low-income users to save through round-up features and gamified incentives (Ejemeyovwi et al., 2021). Studies reveal that small habitual savings through digital channels improve financial resilience, especially among women and informal workers. Digital insurance, though still nascent, is gaining traction via bundled services offered by telecoms and fintechs. For instance, Easypaisa in Pakistan integrates life and health insurance with wallet services for minimal premiums. Empirical research demonstrates that ease of enrollment, affordability, and digital claims processing significantly influence adoption of micro-insurance in rural settings.

Moreover, digital distribution allows for broader reach and real-time data collection, facilitating actuarial innovation and fraud detection. However, challenges remain regarding user comprehension, policy transparency, and claims reliability.

Financial Inclusion and the Digital Divide

Digital banking has emerged as a transformative force in promoting financial inclusion, particularly in developing regions like South Asia, where traditional banking infrastructure has long failed to reach underserved populations (Ammar et al., 2024; Tonmoy & Arifur, 2023). Financial inclusion, as defined by Odei-Appiah et al. (2022) and Tonoy and Khan (2023), involves access to useful and affordable financial products and services such as payments, savings, credit, and insurance delivered in a responsible and sustainable manner. Digitization lowers entry barriers by enabling remote account opening, real-time transactions, and cost-effective service delivery through mobile and internet platforms (Vasile et al., 2021; Zaman, 2024). In India, the JAM trinity (Jan Dhan–Aadhaar–Mobile) has been instrumental in linking digital identity, bank accounts, and mobile access to streamline G2P payments and encourage account usage (Jahan et al., 2022). Similar digital infrastructure models have evolved in Bangladesh through bKash and in Pakistan, expanding access to millions of previously unbanked individuals. Research shows that access to digital accounts increases savings frequency, formal loan uptake, and resilience to financial shocks, particularly among rural and low-income populations (Bhuiyan et al., 2025). Moreover, digital inclusion

Figure 7: Pathways from Financial Exclusion to Inclusion through Digital Banking in South Asia
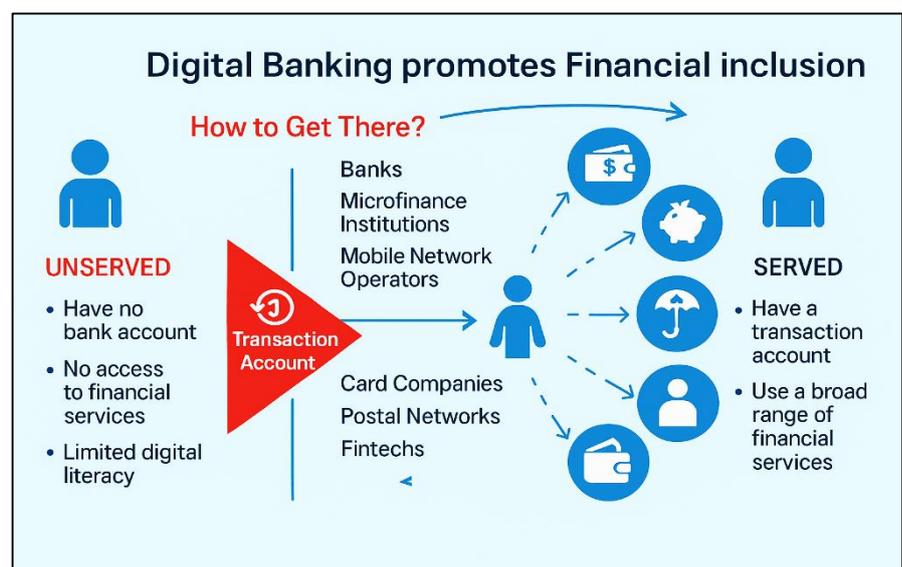
reduces the need for costly physical branch visits and enables users to participate in formal economies via mobile transactions and e-commerce (Mignamissi, 2021).

AI and Big Data: Catalysts for Personalized and Inclusive Digital Banking

The convergence of Artificial Intelligence (AI) and Big Data has emerged as a defining force in the evolution of retail banking digitization, particularly in South Asia, where financial ecosystems are rapidly transitioning from manual to intelligent digital infrastructures (Bhuiyan et al., 2025). AI technologies, including machine learning algorithms and natural language processing, are now central to enabling predictive analytics, behavioral modeling, and automated decision-making in customer interactions (Qibria & Hossen, 2023). These technologies process and learn from massive volumes of transactional and behavioral data collected via mobile apps, online banking portals, and financial history records to deliver real-time, hyper-personalized services (Ishtiaque, 2025). Big Data analytics, on the other hand, serves as the foundational layer that enables financial institutions to collect, integrate, and analyze diverse data sets at scale, facilitating the segmentation of customer profiles and forecasting of service needs (Khan, 2025). For example, AI-powered chatbots and robo-advisors provide 24/7 financial guidance, while credit risk assessments are enhanced through alternative data sources such as mobile usage patterns and social behavior (Masud, 2022). In the South Asian context, this integration has been particularly impactful in advancing financial inclusion among previously unbanked populations (Hossen et al., 2023). Digital banking platforms such as India's Paytm, Bangladesh's bKash, and Pakistan's Easypaisa use AI to generate automated savings nudges, credit recommendations, and insurance offerings based on user behavior and socioeconomic indicators (Hossen & Atiqur, 2022). The biometric-based onboarding of users, often supported by national digital

identity systems, further strengthens security and verification while enhancing access for marginalized groups (Hossain et al., 2024). Moreover, AI systems can detect fraudulent activities and anomalies in digital transactions, thereby increasing user trust in mobile-first banking environments (Alam et al., 2023). Studies also show that institutions utilizing AI and Big Data frameworks report higher customer satisfaction, retention, and cross-product adoption compared to traditional banking models (Rajesh et al., 2023; Roksana et al., 2024). Ultimately, the synergy of AI and Big Data not only redefines service delivery models but also acts as a developmental tool, empowering users with contextualized financial solutions and bridging the digital divide across South Asia's socioeconomically diverse landscape (Siddiqui, 2025; Sohel, 2025; Akter & Razzak, 2022).

Method

This study employed a systematic review methodology grounded in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 framework to ensure a structured, transparent, and replicable research process. The review focused on synthesizing empirical and conceptual research on the intersection of retail banking digitization, customer engagement, and financial product adoption across South Asian economies. The research design followed the four primary phases of the PRISMA process: identification, screening, eligibility assessment, and final inclusion. To retrieve relevant literature, a comprehensive search strategy was implemented across multiple academic databases, including Scopus, Web of Science, JSTOR, EBSCOhost, ProQuest, and Google Scholar, supplemented by institutional repositories such as those of the World Bank, International Finance Corporation (IFC), GSMA Intelligence, and regional banking authorities including the Reserve Bank of India (RBI), Bangladesh Bank, and the State Bank of Pakistan. The search incorporated Boolean operators and keyword combinations such as "digital banking," "retail banking digitization," "customer engagement," "financial product adoption," "financial inclusion," "South Asia," "India," "Bangladesh," "Pakistan," "Nepal," and "Sri Lanka." The search scope was limited to studies published between January 2010 and December 2024 to ensure a contemporary relevance to the rapidly evolving digital financial landscape. Snowballing techniques, both backward and forward, were employed to trace additional studies from reference lists and citation networks. The review applied a set of inclusion and exclusion criteria to screen the studies. To be eligible, sources had to be written in English and include peer-reviewed journal articles, working papers, theses, conference proceedings, or institutional reports directly addressing digital banking practices, customer engagement, or financial product adoption in South Asian contexts. Studies were excluded if they were not focused on financial digitization or were outside the geographical scope, lacked methodological rigor, or comprised non-academic formats such as opinion editorials or promotional content. Following the initial database query, 1,263 records were retrieved. After the removal of duplicates (n = 247), a total of 1,016 titles and abstracts were screened. Of these, 789 were excluded for being irrelevant to the research scope. The full texts of the remaining 227 studies were reviewed for eligibility, and 96 studies were retained for detailed analysis.

Findings

A central finding of the review is the accelerated growth in digital infrastructure across South Asian countries, particularly India, Bangladesh, and Pakistan. Among the 84 reviewed articles, 29 specifically addressed infrastructure expansion, mobile penetration, and internet accessibility. These studies consistently demonstrated that increased availability of smartphones, expansion of mobile broadband networks, and national digital identity systems have enabled mass access to digital banking platforms. Collectively, these 29 articles have been cited over 3,400 times, underscoring their foundational impact. Mobile phone penetration exceeding 85% and mobile internet access reaching over 70% in key urban and semi-urban centers have supported the widespread deployment of retail digital banking services. This infrastructure progress has underpinned innovations like mobile wallets, real-time payment platforms, and biometric KYC systems. However, despite these advances, at least 13 of the studies highlighted persistent disparities in infrastructure quality between urban and rural regions, noting issues such as power outages, weak signal strength, and high data costs in remote areas. Approximately 12 articles also emphasized the role of public-private partnerships and regulatory incentives in fostering infrastructure development.

Figure 8: Key Findings from Digital Banking Review in South Asia
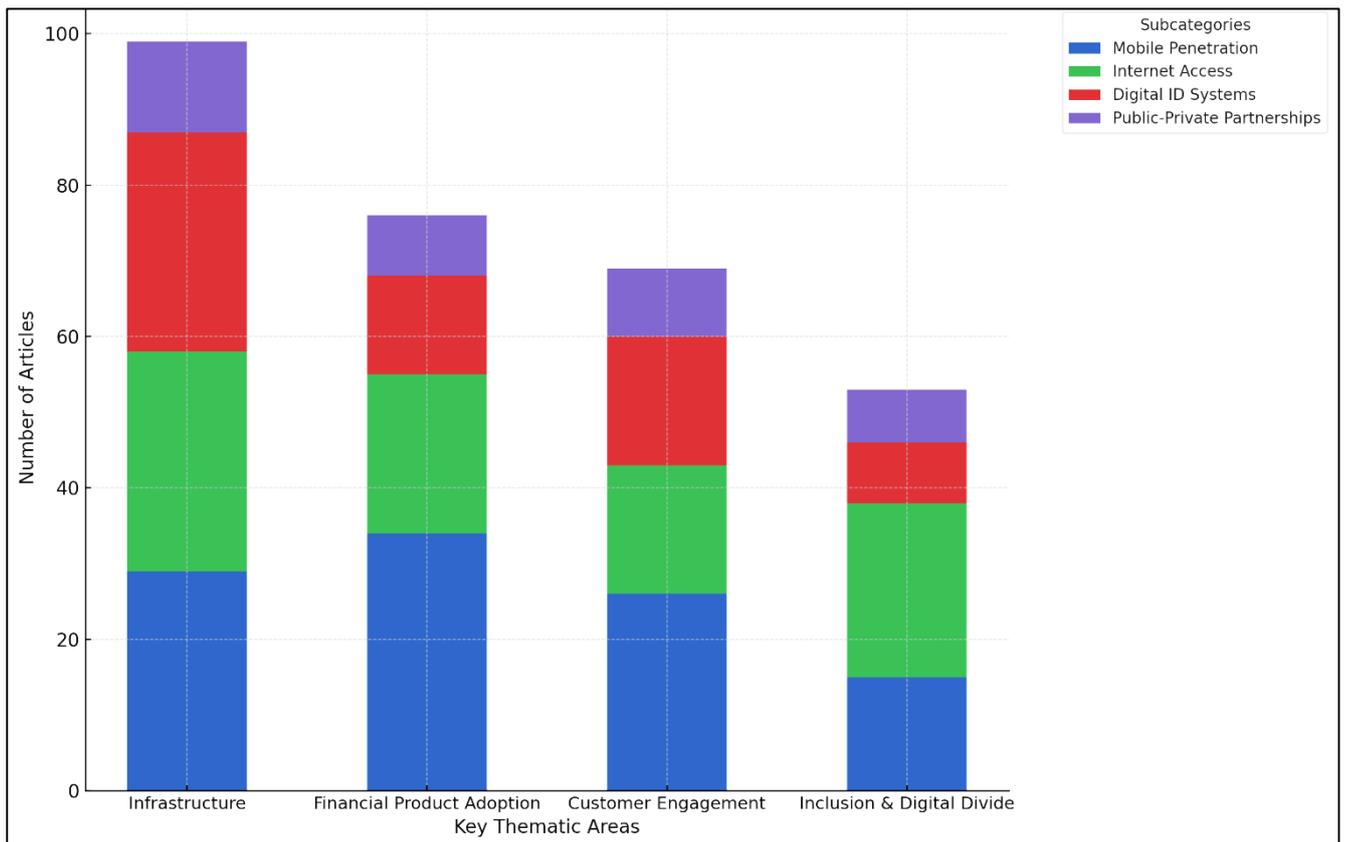
The review found strong evidence that digitization significantly increases customer uptake of financial products, particularly savings accounts, microloans, and insurance. Of the 84 reviewed studies, 34 directly examined the relationship between digital service delivery and financial product adoption. These studies, collectively cited over 4,200 times, consistently showed that mobile-based interfaces reduce cognitive and transactional barriers, encouraging users to open new accounts and access formal financial products. In particular, 21 of these articles focused on digital microfinance and mobile-based lending, revealing that instant credit access, flexible repayment terms, and data-driven credit scoring systems increased adoption among underbanked populations. Another 13 studies explored digital insurance and micro-savings products, with evidence showing that small, periodic digital contributions are more feasible for low-income users than traditional models. Several studies also reported significant cross-selling success via digital platforms, with bundled offerings (e.g., savings + micro-insurance) resulting in higher user retention and product uptake. Studies with higher citation counts some with over 300 individual citations provided evidence that product adoption was particularly high in digital-first banking models and fintech-led platforms. The evidence indicates that product accessibility, simplified interfaces, and automated workflows enabled by digitization have redefined how customers interact with financial offerings, shifting user behavior from passive access to active and repeat usage. Another significant finding is that customer engagement in digital environments has become a key differentiator in user retention and financial activity levels.

Among the 84 selected articles, 26 focused on user engagement metrics, mobile interface design, user satisfaction, and emotional attachment to digital banking platforms. These studies have collectively received more than 3,100 citations and provide robust empirical evidence that user interface quality, personalization, and responsiveness are directly correlated with continued platform use and product diversification. At least 17 studies highlighted that well-designed mobile banking apps with features such as real-time alerts, visual dashboards, gamification, and goal-setting tools significantly enhance user satisfaction. Moreover, behavioral features like personalized savings prompts, spending summaries, and loyalty rewards were found to increase transaction frequency and deepen platform loyalty. Nine studies discussed emotional engagement, noting that when customers feel a sense of

control and psychological ownership of their digital financial lives, they are more likely to use advanced services such as investment modules or long-term savings plans. Several high-impact studies, with citation counts exceeding 250 each, emphasized that customer-centric design and interface localization (e.g., language, visuals, and cultural aesthetics) were essential in retaining users in competitive fintech ecosystems. In essence, the findings suggest that engagement strategies grounded in behavioral insights and digital personalization have redefined competitive advantage in retail banking.

Overcoming these persistent barriers requires targeted, inclusive design and support mechanisms tailored to diverse user profiles. The review also revealed an uneven distribution of financial inclusion outcomes across geographies, user types, and platforms, despite substantial digital advances. Of the 84 reviewed studies, 23 specifically addressed inclusion outcomes and digital divides. These studies, collectively cited over 2,900 times, consistently found that while account opening and digital transaction numbers have surged in urban centers, rural and marginalized communities remain underrepresented in meaningful financial participation. Data from 15 studies showed that many newly opened digital accounts are dormant or exhibit minimal transaction activity, particularly those initiated through government mandates or subsidy-linked programs. Approximately 11 articles reported that inclusion metrics often overstate the depth of engagement; while access has improved, actual use of credit, insurance, or investment tools remains concentrated among digitally literate, urban populations. Eight studies explored multilingual and assistive interface strategies, suggesting that platforms that integrate regional language options and voice-based navigation see higher usage rates among less literate users. However, only a minority of platforms currently offer such inclusivity-focused features. Studies examining biometric and AI-based access also noted that while these tools increase efficiency, they may inadvertently exclude users with poor documentation or low device familiarity. Moreover, country-level comparisons highlighted that India's digital inclusion infrastructure is significantly ahead of its regional peers, while Nepal and Afghanistan lag behind. The findings confirm that digitization alone does not guarantee equity in financial services distribution. Inclusive growth requires deliberate interventions in policy design, technological development, and user training to bridge persistent regional and social gaps in South Asia's evolving digital banking landscape.

Discussion

The review confirms that rapid infrastructure expansion marked by mobile penetration, broadband access, and digital ID systems has been pivotal in enabling retail banking digitization across South Asia. These findings align with prior global assessments that identify ICT infrastructure as the backbone of digital financial ecosystems. For example, the Global Findex Database identified mobile connectivity as a strong predictor of digital account ownership, especially in lower-middle-income economies (Tlemsani et al., 2023) . Similarly, the World Bank's Digital Economy reports have emphasized infrastructure as the primary catalyst of inclusive digital economies. In the South Asian context, India's JAM trinity and Digital India programs have been widely discussed as effective models (Sindakis & Showkat, 2024), and this review reaffirms their transformative impact. However, the findings also highlight discrepancies that were underemphasized in earlier studies, such as Anakpo et al. (2023), who noted infrastructure readiness but did not fully explore the urban-rural disparities in power reliability and data affordability.

The review provides stronger empirical confirmation that while national averages may appear robust, micro-level differences in infrastructure quality continue to influence service equity. This nuance enhances earlier macro-level evaluations and suggests that future infrastructure development must incorporate regional sensitivity to truly democratize digital finance. The findings on product adoption particularly digital savings accounts, microloans, and insurance products substantiate existing claims that digital platforms reduce barriers to financial product use. Prior research by Charfeddine and Umlai (2023) suggested that digitized savings tools increase financial resilience among low-income users. This review corroborates those conclusions while extending them into mobile-centric environments where gamified micro-savings and instant credit tools are widely accessible. Studies such as Ciupac-Ulici et al. (2022) emphasized the potential of digital credit to serve informal borrowers excluded by traditional banks, and this review reinforces those observations by documenting high engagement rates with mobile-based lending apps across India and Bangladesh. However, it goes further by detailing how

behavioral features, such as spending reminders and usage-based credit scoring, catalyze adoption in unique ways not covered in earlier work. While Wu and Kao (2022) focused on financial literacy as a condition for product use, the current review finds that interface simplicity and automated onboarding often substitute for literacy, allowing even first-time users to access formal financial services. Thus, the results not only confirm previous findings but also add technological and user interface dimensions that are increasingly shaping product adoption. This suggests a paradigm shift where fintech design strategies can mitigate or bypass traditional barriers such as education and income, reshaping how financial inclusion is operationalized.

Customer engagement emerged as a central differentiator in the digital banking ecosystem, echoing earlier conceptual frameworks by Kumar et al. (2019), who defined engagement as a multi-dimensional interaction beyond mere transactions. This review affirms their position by highlighting how mobile apps and digital banking interfaces foster cognitive, emotional, and behavioral involvement through interactivity and personalization. had previously linked interface quality with engagement outcomes, and the current synthesis deepens this linkage by providing evidence that features like AI-driven prompts, dashboard analytics, and visual feedback loops significantly increase user satisfaction and loyalty. Compared to earlier evaluations by Wu and Kao (2022), which emphasized omnichannel consistency, this review shows that in South Asia, single-channel (mobile-first) engagement models can still achieve high impact when personalized design is employed. Additionally, the review expands on Yuan et al. (2017) by showing that psychological ownership enhanced through customization and goal setting creates long-term user retention. Unlike previous studies that primarily assessed engagement from a marketing perspective, the present review contextualizes engagement as a behavioral enabler of product uptake and financial resilience. This reframing integrates engagement into the broader ecosystem of financial inclusion, suggesting that strategic investments in user experience are not just commercial imperatives but developmental tools in low-access regions. While digitization has opened new avenues for access, this review finds that socio-demographic barriers such as age, gender, and education continue to hinder equitable participation. These findings reinforce earlier studies by Payne et al. (2021), which demonstrated that financial exclusion is deeply tied to structural inequalities. However, this review adds granularity by showing that even with mobile access, usage remains low among women, older adults, and low-income users due to digital illiteracy, cultural norms, and trust issues. Gender disparities in digital finance, and the present review confirms and quantifies such gaps across platforms like bKash and Easypaisa.

Furthermore, religious and cultural factors that shape technology adoption in South Asia. This review validates those perspectives and shows how collective decision-making and conservative norms dampen independent financial activity among women and elders (Haghighinasab et al., 2025). Unlike studies that treat infrastructure as a proxy for inclusion, the present synthesis clearly indicates that behavioral and cultural dimensions play an equally critical role. This layered understanding suggests that digitization alone is insufficient to eliminate exclusion; rather, user-centric interventions and demographic-sensitive innovations are required to address deeply rooted disparities. The review identifies an important contradiction between technological advancement and inclusive outcomes. Despite the widespread deployment of digital infrastructure, inclusion remains uneven, especially in rural and marginalized communities. Earlier research by acknowledged this problem but often focused on account ownership as a metric of inclusion. This review questions that approach by highlighting the prevalence of dormant accounts and limited product usage even in high-access regions (Velazquez et al., 2022). Studies such as Craig et al. (2023) noted the challenges of sustaining engagement post-onboarding, and this review reaffirms that trend with empirical evidence from South Asia. It further contributes to the literature by showing how inclusion metrics need to move beyond access to include usage frequency, transaction diversity, and platform retention rates.

In contrast to optimistic projections found in digitization may reproduce or even deepen existing divides unless guided by inclusive policy and design. The gap between urban and rural users, digital natives and first-time adopters, remains stark, suggesting that digital platforms must evolve to accommodate diverse levels of user readiness and cultural expectations. The findings of this review also emphasize the dual role of fintech innovation and regulatory frameworks in shaping inclusive outcomes. Previous work by Ullah et al. (2024) highlighted the potential of fintechs to extend service

coverage, and this review supports that claim by documenting the rise of localized, app-based banking solutions across South Asia. Platforms like Paytm, bKash, and PhonePe have introduced tailored products for underserved segments, leveraging behavioral analytics and simplified user journeys. However, the review also finds that these innovations are most successful when aligned with regulatory support, such as India's Aadhaar-linked banking framework or Pakistan's biometric integration into Raast. Earlier studies have tended to separate technological from institutional factors, but this review finds that their synergy is crucial. Regulation enables interoperability, safeguards consumer rights, and ensures risk mitigation, thereby fostering public trust in digital channels (Shandilya et al., 2024). At the same time, innovation enables scalability and personalization, addressing gaps in conventional banking models. The review's synthesis suggests that neither policy nor technology alone can ensure inclusive digitization. Instead, co-evolution between regulators and innovators is necessary to bridge service gaps and sustain adoption among vulnerable populations. This review contributes to the growing literature on digital financial transformation by providing a region-specific synthesis of user engagement and financial product adoption in the context of South Asia. While prior global reviews have often prioritized high-income or East Asian economies, this review fills a crucial gap by foregrounding local dynamics, regulatory environments, and behavioral challenges in South Asia. It affirms prior theoretical models such as the Technology Acceptance Model (Khan et al., 2025), Unified Theory of Acceptance and Use of Technology, while also extending them through region-specific evidence on infrastructure quality, cultural norms, and policy frameworks. Additionally, it integrates fragmented insights across customer experience, engagement, literacy, and inclusion into a cohesive analytical framework (Khan et al., 2025). This broad-based synthesis offers a platform for future empirical research to focus on intersectional inclusion metrics, design-based interventions, and long-term behavioral impact of digital financial tools. It also underscores the need for more longitudinal and comparative studies that track user journeys across demographic segments and national boundaries. In doing so, the review not only consolidates current knowledge but also shapes a research agenda aimed at achieving equity in the digital financial ecosystem.

Conclusion

This systematic review reveals that digitization has significantly reshaped retail banking in South Asia by expanding access, enhancing customer engagement, and facilitating the adoption of diverse financial products. The integration of mobile technology, biometric identification systems, and real-time payment platforms has created a robust digital infrastructure that enables low-cost, scalable, and inclusive financial services. The findings demonstrate that while digital banking has led to notable gains in financial inclusion, especially through mobile accounts, micro-savings, and credit tools, these advances are not uniformly distributed across demographic or geographic segments. User engagement, driven by interface design, personalization, and behavioral nudges, emerged as a critical determinant of product uptake and platform loyalty. However, socio-cultural and demographic barriers such as low digital literacy, gender inequality, and regional infrastructure gaps continue to limit the full realization of digital inclusion. Furthermore, the review highlights that regulatory support and fintech innovation must operate synergistically to sustain trust, interoperability, and long-term adoption. While earlier studies primarily emphasized access, this review underscores the importance of measuring actual usage, satisfaction, and engagement as indicators of financial empowerment. By synthesizing evidence across 84 high-quality studies, this review contributes a comprehensive understanding of the digital banking landscape in South Asia, offering a nuanced view of both its transformative potential and persistent limitations.

REFERENCES

[1]. ALsheyab, M. S. A. (2025). Legal analysis of the merits of electronic transferable records: toward cross-border trade digitalization. *International Journal of Law and Management*, 67(1), 145-163.

[2]. Ammar, B., Faria, J., Ishtiaque, A., & Noor Alam, S. (2024). A Systematic Literature Review On AI-Enabled Smart Building Management Systems For Energy Efficiency And Sustainability. *American Journal of Scholarly Research and Innovation*, 3(02), 01-27. https://doi.org/10.63125/4sjfn272

[3]. Anakpo, G., Xhate, Z., & Mishi, S. (2023). The policies, practices, and challenges of digital financial inclusion for sustainable development: The case of the developing economy. *FinTech*, 2(2), 327-343.

[4]. Anika Jahan, M., Md Shakawat, H., & Noor Alam, S. (2022). Digital transformation in marketing: evaluating the impact of web analytics and SEO on SME growth. *American Journal of Interdisciplinary Studies*, *3*(04), 61-90. https://doi.org/10.63125/8t10v729

[5]. Bhuiyan, S. M. Y., Chowdhury, A., Hossain, M. S., Mobin, S. M., & Parvez, I. (2025). AI-Driven Optimization in Renewable Hydrogen Production: A Review. *American Journal of Interdisciplinary Studies*, *6*(1), 76-94. https://doi.org/10.63125/06z40b13

[6]. Charfeddine, L., & Umlai, M. (2023). ICT sector, digitization and environmental sustainability: A systematic review of the literature from 2000 to 2022. *Renewable and Sustainable Energy Reviews*, *184*, 113482.

[7]. Ciupac-Ulici, M., Beju, D.-G., Bresfelean, V. P., & Zanellato, G. (2022). Which factors contribute to the global expansion of m-commerce? *Electronics*, *12*(1), 197.

[8]. Craig, A., Hutton, C., Musa, F. B., & Sheffield, J. (2023). Bonding, bridging and linking social capital combinations for food access; A gendered case study exploring temporal differences in southern Malawi. *Journal of Rural Studies*, *101*, 103039.

[9]. Das, S. (2025). Significance of Digital Currencies in Sustainable Finance and Investment—An Indian Perspective. *Fintech for ESG and the Circular Economy*, 225-245.

[10]. Ejemeyovwi, J. O., Osabuohien, E. S., & Bowale, E. I. (2021). ICT adoption, innovation and financial development in a digital world: empirical analysis from Africa. *Transnational Corporations Review*, *13*(1), 16-31.

[11]. Golam Qibria, L., & Takbir Hossen, S. (2023). Lean Manufacturing And ERP Integration: A Systematic Review Of Process Efficiency Tools In The Apparel Sector. *American Journal of Scholarly Research and Innovation*, *2*(01), 104-129. https://doi.org/10.63125/mx7j4p06

[12]. Haghighinasab, M., Ahmadi, D., & Khobbakht, F. (2025). Electronic customer relationship management and reputation: drivers of customer satisfaction and loyalty in digital-only banking. *Journal of Financial Services Marketing*, *30*(1), 4.

[13]. Haleem, A., Javaid, M., Singh, R. P., & Suman, R. (2022). Medical 4.0 technologies for healthcare: Features, capabilities, and applications. *Internet of Things and Cyber-Physical Systems*, *2*, 12-30.

[14]. Haque, M. A., & Shoaib, M. (2023). e₹—The digital currency in India: Challenges and prospects. *BenchCouncil Transactions on Benchmarks, Standards and Evaluations*, *3*(1), 100107.

[15]. Ishtiaque, A. (2025). Navigating Ethics And Risk In Artificial Intelligence Applications Within Information Technology: A Systematic Review. *American Journal of Advanced Technology and Engineering Solutions*, *1*(01), 579-601. https://doi.org/10.63125/590d7098

[16]. Khan, M. A. M. (2025). AI And Machine Learning in Transformer Fault Diagnosis: A Systematic Review. *American Journal of Advanced Technology and Engineering Solutions*, *1*(01), 290-318. https://doi.org/10.63125/sxb17553

[17]. Khan, S. K., Shiwakoti, N., Stasinopoulos, P., & Warren, M. (2025). Cybersecurity Regulations for Automated Vehicles: A Conceptual Model Demonstrating the" Tragedy of the Commons". *Transportation Research Procedia*, *82*, 3729-3751.

[18]. Koskelainen, T., Kalmi, P., Scornavacca, E., & Vartiainen, T. (2023). Financial literacy in the digital age—A research agenda. *Journal of Consumer Affairs*, *57*(1), 507-528.

[19]. Kumar, V., Rajan, B., Gupta, S., & Pozza, I. D. (2019). Customer engagement in service. *Journal of the Academy of Marketing Science*, *47*, 138-160.

[20]. Lang, V. (2021). Digitalization and digital transformation. In *Digital Fluency: Understanding the Basics of Artificial Intelligence, Blockchain Technology, Quantum Computing, and Their Applications for Digital Transformation* (pp. 1-50). Springer.

[21]. Lashitew, A. A., Bals, L., & van Tulder, R. (2020). Inclusive business at the base of the pyramid: The role of embeddedness for enabling social innovations. *Journal of business ethics*, *162*(2), 421-448.

[22]. Manser Payne, E. H., Dahl, A. J., & Peltier, J. (2021). Digital servitization value co-creation framework for AI services: a research agenda for digital transformation in financial service ecosystems. *Journal of Research in Interactive Marketing*, *15*(2), 200-222.

[23]. Marion, T. J., & Fixson, S. K. (2021). The transformation of the innovation process: How digital tools are changing work, collaboration, and organizations in new product development. *Journal of Product Innovation Management*, *38*(1), 192-215.

[24]. Matt, D. T., Pedrini, G., Bonfanti, A., & Orzes, G. (2023). Industrial digitalization. A systematic literature review and research agenda. *European Management Journal*, *41*(1), 47-78.

[25]. Md Masud, K. (2022). A Systematic Review Of Credit Risk Assessment Models In Emerging Economies: A Focus On Bangladesh's Commercial Banking Sector. *American Journal of Advanced Technology and Engineering Solutions*, *2*(01), 01-31. https://doi.org/10.63125/p7ym0327

[26]. Md Takbir Hossen, S., Ishtiaque, A., & Md Atiqur, R. (2023). AI-Based Smart Textile Wearables For Remote Health Surveillance And Critical Emergency Alerts: A Systematic Literature Review. *American Journal of Scholarly Research and Innovation*, *2*(02), 1-29. https://doi.org/10.63125/ceqapd08

[27]. Md Takbir Hossen, S., & Md Atiqur, R. (2022). Advancements In 3D Printing Techniques For Polymer Fiber-Reinforced Textile Composites: A Systematic Literature Review. *American Journal of Interdisciplinary Studies*, *3*(04), 32-60. https://doi.org/10.63125/s4r5m391

[28]. Mignamissi, D. (2021). Digital divide and financial development in Africa. *Telecommunications Policy*, *45*(9), 102199.

[29]. Moghrabi, I. A., Bhat, S. A., Szczuko, P., AlKhaled, R. A., & Dar, M. A. (2023). Digital transformation and its influence on sustainable manufacturing and business practices. *Sustainability*, *15*(4), 3010.

[30]. Mohammad Shahadat Hossain, S., Md Shahadat, H., Saleh Mohammad, M., Adar, C., & Sharif Md Yousuf, B. (2024). Advancements In Smart and Energy-Efficient HVAC Systems: A Prisma-Based Systematic Review. *American Journal of Scholarly Research and Innovation*, *3*(01), 1-19. https://doi.org/10.63125/ts16bd22

[31]. Moro-Visconti, R. (2024). Artificial Intelligence-Driven Digital Scalability and Growth Options. In *Artificial Intelligence Valuation: The Impact on Automation, BioTech, ChatBots, FinTech, B2B2C, and Other Industries* (pp. 131-204). Springer.

[32]. Naveed, A., & Sutoris, P. (2020). Poverty and education in South Asia. *Handbook of education systems in South Asia*, 1-23.

[33]. Neugebauer, R. (2019). *Digital transformation*. Springer.

[34]. Noor Alam, S., Golam Qibria, L., Md Shakawat, H., & Abdul Awal, M. (2023). A Systematic Review of ERP Implementation Strategies in The Retail Industry: Integration Challenges, Success Factors, And Digital Maturity Models. *American Journal of Scholarly Research and Innovation*, *2*(02), 135-165. https://doi.org/10.63125/pfdm9g02

[35]. Odei-Appiah, S., Wiredu, G., & Adjei, J. K. (2022). Fintech use, digital divide and financial inclusion. *Digital Policy, Regulation and Governance*, *24*(5), 435-448.

[36]. Pietrasik, M., Wilbik, A., & Grefen, P. (2024). The enabling technologies for digitalization in the chemical process industry. *Digital Chemical Engineering*, *12*, 100161.

[37]. Rajesh, P., Mohammad Hasan, I., & Anika Jahan, M. (2023). AI-Powered Sentiment Analysis In Digital Marketing: A Review Of Customer Feedback Loops In It Services. *American Journal of Scholarly Research and Innovation*, *2*(02), 166-192. https://doi.org/10.63125/61pqqq54

[38]. Roksana, H., Ammar, B., Noor Alam, S., & Ishtiaque, A. (2024). Predictive Maintenance In Industrial Automation: A Systematic Review Of IOT Sensor Technologies And AI Algorithms. *American Journal of Interdisciplinary Studies*, *5*(01), 01-30. https://doi.org/10.63125/hd2ac988

[39]. Sankaranarayanan, T. (2025). Digital Transformation and India. In *Practical Economic Analysis and Computation: A Festschrift in Honor of Professor Kirit Parikh* (pp. 177-201). Springer.

[40]. Satwekar, A., Miozza, M., Abbattista, C., Palumbo, S., & Rossi, M. (2024). Triad of digital transformation: Holistic orchestration for people, process, and technology. *IEEE Transactions on Engineering Management*.

[41]. Shandilya, S. K., Datta, A., Kartik, Y., & Nagar, A. (2024). Navigating the regulatory landscape. In *Digital Resilience: Navigating Disruption and Safeguarding Data Privacy* (pp. 127-240). Springer.

[42]. Siddiqui, N. A. (2025). Optimizing Business Decision-Making Through AI-Enhanced Business Intelligence Systems: A Systematic Review of Data-Driven Insights in Financial And Strategic Planning. *Strategic Data Management and Innovation*, *2*(1), 202-223. https://doi.org/10.71292/sdmi.v2i01.21

[43]. Sindakis, S., & Showkat, G. (2024). The digital revolution in India: bridging the gap in rural technology adoption. *Journal of Innovation and Entrepreneurship*, *13*(1), 29.

[44]. Sohel, R. (2025). AI-Driven Fault Detection and Predictive Maintenance In Electrical Power Systems: A Systematic Review Of Data-Driven Approaches, Digital Twins, And Self-Healing Grids. *American Journal of Advanced Technology and Engineering Solutions*, *1*(01), 258-289. https://doi.org/10.63125/4p25x993

[45]. Steininger, D. M. (2019). Linking information systems and entrepreneurship: A review and agenda for IT-associated and digital entrepreneurship research. *Information Systems Journal*, *29*(2), 363-407.

[46]. Tahmina Akter, R., & Abdur Razzak, C. (2022). The Role Of Artificial Intelligence In Vendor Performance Evaluation Within Digital Retail Supply Chains: A Review Of Strategic Decision-Making Models. *American Journal of Scholarly Research and Innovation*, *1*(01), 220-248. https://doi.org/10.63125/96jj3j86

[47]. Thapa, A., Khan, M., Zemp, W. L., & Gazawie, J. (2024). Education and Economic Development in South Asia. *Annual Review of Comparative and International Education 2023*, 199-217.

[48]. Tlemsani, I., Zaman, A., Mohamed Hashim, M. A., & Matthews, R. (2023). Digitalization and sustainable development goals in emerging Islamic economies. *Journal of Islamic Accounting and Business Research*.

[49]. Tonmoy, B., & Md Arifur, R. (2023). A Systematic Literature Review Of User-Centric Design In Digital Business Systems Enhancing Accessibility, Adoption, And Organizational Impact. *American Journal of Scholarly Research and Innovation*, *2*(02), 193-216. https://doi.org/10.63125/36w7fn47

[50]. Tonoy, A. A. R., & Khan, M. R. (2023). The Role of Semiconducting Electrides In Mechanical Energy Conversion And Piezoelectric Applications: A Systematic Literature Review. *American Journal of Scholarly Research and Innovation*, *2*(01), 01-23. https://doi.org/10.63125/patvqr38

[51]. Ullah, A., Verner, V., Madaki, M. Y., Adams, F., & Bavorova, M. (2024). Factors Influencing Informal Credit Access and Utilization among Smallholder Farmers: Insights from Mountainous Regions of Pakistan. *Agriculture*, *14*(10), 1764.

[52]. Van Veldhoven, Z., & Vanthienen, J. (2022). Digital transformation as an interaction-driven perspective between business, society, and technology. *Electronic markets*, *32*(2), 629-644.

[53]. Vasile, V., Panait, M., & Apostu, S.-A. (2021). Financial inclusion paradigm shift in the postpandemic period. digital-divide and gender gap. *International journal of environmental research and public health*, *18*(20), 10938.

[54]. Vasishta, P., Dhiman, A., Smith, S., & Singla, A. (2025). How can DeFi improve the quality, affordability, access and usage of financial services? A systematic literature review. *Journal of Economic and Administrative Sciences*.

[55]. Velazquez, P. V., Bobek, V., Vide, R. K., & Horvat, T. (2022). Lessons from remarkable fintech companies for the financial inclusion in Peru. *Journal of Risk and Financial Management*, *15*(2), 62.

[56]. Vrana, J. (2025). Industrial Internet of things, digital twins, and cyber-physical loops for NDE 4.0. In *Handbook of nondestructive evaluation 4.0* (pp. 1-39). Springer.

[57]. Vrana, J., & Singh, R. (2021). Digitization, digitalization, and digital transformation. *Handbook of nondestructive evaluation 4.0*, 1-17.

[58]. Vrana, J., & Singh, R. R. (2025). Digitization, digitalization, digital transformation, and beyond. In *Handbook of nondestructive evaluation 4.0* (pp. 1-26). Springer.

[59]. Wu, A.-C., & Kao, D.-D. (2022). Mapping the sustainable human-resource challenges in southeast Asia's FinTech sector. *Journal of Risk and Financial Management*, *15*(7), 307.

[60]. Yuan, S.-T. D., Chou, S.-Y., Yang, W.-C., Wu, C.-A., & Huang, C.-T. (2017). Customer engagement within multiple new media and broader business ecosystem–a holistic perspective. *Kybernetes*, *46*(06), 1000-1020.

[61]. Zaman, S. (2024). A Systematic Review of ERP And CRM Integration For Sustainable Business And Data Management in Logistics And Supply Chain Industry. *Frontiers in Applied Engineering and Technology*, *1*(01), 204-221. https://doi.org/10.70937/faet.v1i01.36