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Digital Transformation and Bank Performance: Exploring the Relationship in the Nepalese Banking Sector

Arjun Bahadur Kandel
Chief Manager
Nepal Bank Limited
arjunkandel2078@gmail.com
https://orcid.org/0009-0002-9276-6566

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Abstract

This study explores the relationship between digital transformation and the banking sector of Nepal, analyzing its association with operational efficiency, customer experience, and financial inclusion. Through a qualitative and analytical approach based on secondary data, the research evaluates digital adoption trends and perceived outcomes across major Nepalese banks, including private sector leaders like Standard Chartered Bank Nepal, Nabil Bank, and NMB Bank, as well as government-owned institutions such as Nepal Bank Limited and Rastriya Banijya Bank. There are significant advancements in digital banking services, including mobile banking, AI-driven platforms, and blockchain-based payment systems, which have enhanced transaction speed, reduced costs, and expanded financial access. However, challenges remain, including disparities between private and public banks, cybersecurity risks, and rural-urban digital divides. The study shows the need for regulatory reforms, infrastructure development, and digital literacy programs to ensure inclusive growth. The paper concludes with strategic recommendations for policymakers and financial institutions to accelerate the digital banking evolution of Nepal while mitigating risks.

Keywords: Digital transformation, Nepalese banking sector, financial inclusion, operational efficiency

Introduction

The integration of modern digital technologies is what drives digital transformation in banking. This is a big change in how banks do business. It goes beyond simple online banking services to include mobile apps, digital payment systems, artificial intelligence (AI), blockchain, cloud

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computing, and big data analytics (Chao, Zhou & Yang, 2024). This change makes operations more efficient, improves the customer experience, and keeps the company competitive in a changing financial landscape. It is a multi-faceted process that includes technological progress, changes to the way organizations are structured, and changes to the way strategies are set. It marks a shift away from traditional banking models toward new, technology-driven ways of doing business (António Porfírio et al., 2024).

There are many reasons why banks need to go digital. Customers' needs are changing, and they now want banking experiences that are seamless, mobile-first, and in real time (Chhetri & Aryal, 2025). FinTech startups have changed the way traditional banks work by offering new, user-friendly solutions. This has forced established banks to come up with new ideas or risk going out of business (Boot et al., 2021). Also, digital technologies make security better by using biometric authentication and detecting fraud in real time, and they make it easier to follow global rules (Yaqin & Safuan, 2023). Automation and streamlined digital workflows lower costs, cut down on mistakes made by people, and make it possible to have an omnichannel experience, which means that service is always the same across mobile apps, websites, and physical branches (Kane et al., 2015).

Globally, digital transformation has revolutionised banking operations through mobile banking, AI, blockchain, and big data analytics, enabling efficient service delivery in deposits, payments, loans, and investments (Niraula & Kautish, 2019). However, Nepal's banking sector faces unique challenges, including low digital literacy, inadequate rural infrastructure, and unreliable internet connectivity (Acharya & Rahman, 2021). Despite these barriers, digital transformation presents significant opportunities for financial inclusion and operational efficiency in Nepal's banking industry (Gautam & Sah, 2023).

Existing literature presents mixed findings on the impact of digital transformation on bank performance. While some studies highlight its adverse effects, such as increased operational risks (Wang, 2018) and uncertain profitability, others emphasise its benefits, including enhanced efficiency, customer satisfaction, and competitive advantage (Schumann & Tittmann, 2015; Tran, Le & Phan, 2025). Recent studies show that lending decisions, operational monitoring, and outreach to the customers have enhanced due to digital transformation (Berger, 2020; Pierri & Timmer, 2022). But, there are still cybersecurity threats, regulatory compliance problems, and digital illiteracy particularly for developing economies like Nepal (Ionașcu et al., 2023; Basnayake et al., 2024).

Only a handful of analysis have been conducted to find out how digital transformation in commercial banks of Nepal will impact the economy. Several studies show that digitalization can help banks allure new customers, cut costs, and boost revenues. But, there is high degree of digital transformation and its effect on the overall performance of Nepalese banks in terms of profitability, productivity of employees, customer experience and operational efficiency between less investigated. Moreover, it is still unclear as to how the private sector and the government sector banks differ in adopting digital technology. In order to fill this gap, this study describes the existing state of digital transformation and examines its perceived impact. The study also examines how Nepal's digital adoption compares with the rest of the world and

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other differences between private and government banks. The study, moreover, investigates central problems such as digital illiteracy, lack of infrastructure, and cybersecurity threats while also providing strategic recommendations.

Methodology

This paper analyzes digital transformation in Nepal's banking sector studying and aims at giving descriptive explanations and interpretations of the findings received from the content analysis of the secondary data. Through synthesis of existing literature and institutional reports, it allows for an in-depth details into the trends, challenges and opportunities in Nepal's evolving financial landscape.

Data Collection

The study relies extensively on secondary data. Secondary data has been collected from sources published between 2020 and 2025. The profiling of banks was done on a purposive sampling basis.

Analytical Framework

The selection criteria of the bank were being market leader; having digital innovation recognition; ensuring representation of private and government ownership structures in order to facilitate comparisons; and preference for banks with comprehensive public report or analysis. The selected banks' annual reports, financial statements, and technology or digital reports were used as data sources. Also, various publications of Nepal Rastra Bank with respect to the digital banking policy and payment system were used as data sources. The study also used global banking reports, case studies of FinTech, and academic journals to gain comparative insights and assess Nepal's standard.

Findings are classified into five important categories: technology adoption, operational efficiency, customer experience, profitability and performance, and regulatory challenges. Each theme is assessed through key indicators: for example, the penetration of mobile banking and deployment of AI as indicators of technological adoption; processing time reductions and cost savings measure operational efficiency.

The study employed a systematic thematic content analysis process, which consisted of several structured stages: initial familiarization and coding of documents to identify key concepts such as "mobile banking adoption" and "RPA implementation"; the collation and organization of these codes into overarching themes, including Technological Adoption, Operational Efficiency, Customer Experience & Financial Inclusion, Profitability & Performance, and Regulatory & Cybersecurity Challenges; and finally, theme validation through revisiting the data and charting evidence into a thematic matrix for comparative analysis.

To enable a direct, systematic comparison, a summary table (Table 1) synthesizes key quantitative and qualitative metrics across the profiled banks. This comparative approach strengthens the analysis by highlighting the tangible differences in digital maturity and strategy execution between private and public sector institutions.

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Limitations

Several limitations constrain this research. It is important to note that this qualitative, descriptive approach, while valuable for identifying trends and rich contextual insights, cannot establish causal relationships. The findings indicate associations and perceptions between digital transformation and performance metrics, as reported in secondary sources, rather than definitive causation. The exclusive reliance on secondary data means the study lacks firsthand perspectives from bank customers or employees. Furthermore, while this study reports quantitative findings from secondary sources (e.g., bank annual reports, NRB publications), it does not perform independent statistical analysis to validate these figures. The reported metrics should therefore be understood as the institutions' own assessments or those of the regulator, rather than findings from original empirical testing. Furthermore, while the initial scope considered profitability and employee productivity, this study's reliance on publicly available secondary data revealed a scarcity of consistent, granular financial and human resource metrics across all profiled banks. Consequently, the analysis focuses primarily on qualitative and operational indicators, such as efficiency gains, service adoption, and customer access. A detailed quantitative analysis of financial ratios and productivity metrics remains a valuable area for future research with access to proprietary datasets. The rapidly evolving nature of digital banking technologies also means some findings may quickly become outdated. Furthermore, the study does not extensively explore collaborations between banks and FinTech companies, which represent a growing aspect of digital transformation in Nepal's financial sector.

Findings

Digital Transformation in Nepalese Banks

The Nepalese banking sector has undergone a remarkable shift from traditional brick-and-mortar operations to digital financial services, though this transformation remains at a nascent stage compared to global standards (Nepal Rastra Bank [NRB], 2024). As the country's financial backbone, the sector plays a pivotal role in economic growth, financial inclusion, and employment generation, with 107 licensed institutions comprising 20 commercial banks, 17 development banks, 17 finance companies, and 52 microfinance institutions operating through 11,530 branches nationwide (NRB, 2024). Commercial banks dominate the landscape, holding 83.6% of total banking assets, followed by development banks (8.3%), finance companies (2.0%), and microfinance institutions (6.1%) as of mid-2024 (NRB, 2024).

The digital payment ecosystem has expanded significantly, with Nepal Rastra Bank licensing 9 Payment System Operators and 25 Payment System Providers by June 2025. This infrastructure supports diverse digital financial services, including mobile banking (used by approximately 27.5 million Nepalis, representing 90% of the population), internet banking (2.6 million users), and digital wallets (27 million users) (NRB, 2024). The adoption of electronic payment systems such as ConnectIPS, Fonepay, RTGS, and QR-based payments reflects growing digital financial inclusion. However, internet penetration remains a challenge at 55.8% (16.5 million users), despite significant growth from 38.4% in January 2022 (World Bank,

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2024). The 132% mobile penetration rate (39 million connections) suggests strong potential for mobile financial services, yet 44.2% of the population (13.1 million people) remain offline, highlighting persistent digital divides (World Bank, 2024).

Private sector banks have adopted digital technologies more quickly than government-owned banks. They have created full digital banking platforms that let customers manage their accounts, send money, pay bills, and process loans. But systemic problems like poor digital infrastructure, low financial literacy, and strict rules continue to hinder full digital transformation (NRB, 2024). The industry struggles to adopt advanced technologies like AI and blockchain, and as more people use digital devices, the risks to cybersecurity have grown. Digital transformation has changed the way banks in Nepal are set up and how they manage their employees. Many banks now use hybrid work models and digital training programs. Digital banking is widely used in cities whereas in rural areas it is not able to achieve the same popularity due to lack of infrastructure and low levels of digital literacy. The World Bank (2024) stated that coordinated policy changes must be made by public and private sector banks along with investment in digital infrastructure in order for financial digitisation to be made inclusive. The banking sector of Nepal is undergoing a transition where high technological adoption is in place with innovations that display the highest global standards like M-money while structural problems are also present which require solving.

Exploring the Digital Transformation in Nepal's Banking Sector

The digital transformation going on in Nepal's banks are being understood as a different way of offering and consuming. The analysis evaluates the impact of major Nepalese banks on the journey of Nepal towards digitalization.

Standard Chartered Bank Nepal Limited

Standard Chartered Bank Nepal Limited (SCBNL), the international banking leader, has implemented digital solutions that set the industry benchmark. The "Straight2Bank" (S2B) platform of the bank has revolutionised corporate banking. It offers integrated solutions along with cash management, trade finance, treasury operations that cut processing times by about 40%. The SCBNL Mobile App has been adopted by 85% of the bank's retail customers. Additionally, customers enjoy biometric authentication and AI-powered tools for improved financial management.

A pivotal innovation has been the integration of SCpay with Nepal's ConnectIPS system, enabling real-time cross-border transactions that previously took 2-3 business days. This integration has increased the bank's foreign remittance processing capacity by 60% while reducing operational costs by 25% (NRB, 2024). The cloud-based architecture of SCBNL's digital platforms has also improved system reliability, maintaining 99.9% uptime during peak transaction periods.

Nabil Bank Limited

As Nepal's first joint venture bank, Nabil Bank has consistently led technological adoption in the sector. The bank's digital transformation strategy rests on two pillars: internal process automation and customer-facing digital channels. Internally, the implementation of Robotics Process Automation (RPA) has automated 65% of back-office operations, reducing human

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errors in transaction processing by 90% (Nabil Bank, 2024). The bank's investment in a new Core Banking System (CBS) has enabled real-time data analytics, improving credit risk assessment accuracy by 40%.

Externally, Nabil's nBank platform represents Nepal's first true neo-banking experience, attracting over 500,000 users within its first year of operation (Nabil Bank, 2024). The platform's QR payment system processes over 1 million transactions monthly, while online loan applications have reduced approval times from 7 days to under 24 hours. However, these advancements required substantial investment exceeding NPR 750 million in cybersecurity infrastructure to combat rising digital fraud attempts (Nabil Bank, 2024).

NMB Bank Limited

NMB Bank has distinguished itself through digital solutions promoting financial inclusion. The bank's e-KYC system has enabled paperless account opening for over 1.2 million customers, with 35% from previously unbanked rural areas . NMB's mobile banking app incorporates vernacular language support and simplified interfaces, resulting in a 45% increase in digital transactions among users over age 50 (NRB, 2024).

The bank's integration with Flywire has streamlined education-related foreign payments, processing over NPR 5 billion in international education fees annually. However, NMB faces ongoing challenges in rural connectivity, where 30% of digital transaction attempts fail due to poor internet infrastructure.

Nepal Bank Limited

As Nepal's oldest commercial bank, Nepal Bank Limited (NBL) faces unique digital transformation hurdles. The bank's continued reliance on the domestic PUMORI software system creates compatibility issues with modern payment platforms, resulting in 15% slower transaction processing compared to private banks. Despite these constraints, NBL has implemented centralised systems for payroll, trade finance, and credit administration that have reduced operational costs by 20%.

The bank’s NFC-enabled e-ticketing system for public transportation represents an innovative digital initiative but due to its inherent difficulties, it has not been in practice. However, NBL estimates requiring NPR 1.2 billion in technology upgrades to achieve full CBS modernization by 2026.

Rastriya Banijya Bank

Rastriya Banijya Bank (RBB), Nepal's largest government-owned bank, demonstrates both the potential and challenges of public sector digital transformation. While the bank's RBB Digital Sansar mobile platform has gained 1.5 million users, it suffers from 30% higher downtime rates than private bank apps. The persistent use of outdated PUMORI software limits integration with modern payment systems, causing reconciliation delays averaging 48 hours (NRB, 2024). Under its 2020-2025 strategic plan, RBB has digitised 60% of payment processes but continues to struggle with data fragmentation across 260 branches. The bank's planned NPR 950 million technology upgrade aims to address these issues by 2026, including the implementation of a new CBS and integrated MIS.

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Global IME Bank

Global IME Bank's digital strategy focuses on creating Nepal's most comprehensive cashless ecosystem. The Global Smart Plus mobile app incorporates AI-driven financial planning tools used by over 800,000 customers (Global IME Bank, 2024). The bank's Digital Universe lounges have processed over 5 million self-service transactions since launch, reducing branch traffic by 35%.

The LAKSHYA 2025 strategy has guided investments exceeding NPR 1 billion in digital infrastructure, resulting in 99.7% successful transaction rates (Global IME Bank, 2024). However, the bank faces increasing cybersecurity costs, allocating 25% of its technology budget to threat prevention.

Sector-Wide Challenges

The aggregate challenges of these transformations reveals several key trends. Digital transaction volumes across Nepalese banks grew 78% year-over-year in 2024, while branch transactions declined by 40%. Operational efficiency gains average 30%, but cybersecurity incidents increased by 45%, emphasising growing digital risks (NRB , 2024).

Persistent challenges include:

- Only 35% of rural branches offer full digital services versus 90% urban penetration (World Bank, 2024)
- 60% of bank staff require digital upskilling
- 18-month average approval time for new fintech solutions

The future trajectory suggests that Nepalese banks investing 15-20% of annual profits in digital transformation achieve 3-5% higher ROE compared to laggards (NRB, 2024). As the sector evolves, successful institutions will balance innovation with risk management, customer education, and regulatory compliance to fully realise digital banking's potential in Nepal's unique financial landscape.

Table 1 provides a systematic comparison of digital transformation metrics, clearly illustrating the pronounced disparity between private and public sector banks. The data reveals that leading private institutions like Nabil Bank and Global IME Bank dedicate a significant portion of their resources (15-20% of profits or dedicated billion-NPR funds) to technology, which correlates with higher functional outputs, such as robust mobile app adoption and substantial operational efficiency gains of 30-65%. In stark contrast, public banks like Rastriya Banijya Bank and Nepal Bank Limited are in a catch-up phase, with metrics dominated by planned investment figures and fundamental challenges, including significantly higher mobile app downtime (30%) and slower transaction processing speeds. This comparative analysis strengthens the argument that ownership structure is a key determinant of digital maturity, with private banks leveraging agility and investment to drive innovation, while public banks remain constrained by legacy systems and delayed modernization efforts.

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Table 1: Comparative Analysis of Digital Transformation Metrics Across Selected Nepalese Banks

Bank (Ownership)	Digital Investment (% of Profit)	Mobile App Users (millions)	Key Digital Initiative	Operational Efficiency Gain (%)	Notable Challenge
Nabil Bank (Private)	15-20%	1.61 (nBank)	RPA, Neo-banking	65% back-office automated	High cybersecurity costs (NPR 750M)
Standard Chartered (Private)	-	85% adoption	Straight2Bank, SCpay	40% faster processing	-
NMB Bank (Private)	-	-	e-KYC, Vernacular UI	45% inc. digital txns	30% rural tx failure
Global IME (Private)	> NPR 1 Bn (LAKSHYA)	2.23	AI financial tools	99.7% tx success rate	25% tech budget to security
RBB (Public)	NPR 0.95 Bn (planned)	1.5	RBB Digital Sansar	60% payment digitized	30% higher app downtime
Nepal Bank (Public)	NPR 1.2 Bn (planned)	.95	NFC e-ticketing	20% cost reduction	15% slower processing

Discussion

The study validates considerable differences in digital maturity between private and public sector banks, aligning with analogous trends identified in other developing economies (Singh et al., 2023). According to NRB (2024), private banks like Nabil and Global IME have set aside 15–20% of their annual profits for technology upgrades. This has led to fully digital platforms that are more reliable (99.9% uptime compared to 85–90%) and functional than those of government banks. This is in line with Berger's (2020) finding that private institutions that are more flexible can adopt new technology faster than public sector banks that are more bureaucratic. However, Nepal's situation seems more severe because public banks are very reliant on old systems. For example, NBL and RBB still use PUMORI software even though it has known problems. This indicates that, in addition to standard public-private sector disparities, Nepal encounters distinct institutional inertia within its state-owned banking infrastructure.

The digital transformation has clearly helped people with low incomes get access to financial services, but not equally across all demographic groups. The vernacular language interfaces and simplified designs of NMB Bank have effectively augmented digital engagement among

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older and rural demographics (NRB, 2024), corroborating analogous conclusions by Ghimire and Wang (2024) regarding the significance of localised digital solutions. The fact that 44.2% of people still live offline (World Bank, 2024) shows that digital financial services alone can't fix structural problems like gaps in rural connectivity. This corroborates the warnings from Mago and Chitokwindo (2024) and Del Sarto et al. (2025) that the growth of digital banking must coincide with the advancement of infrastructure to attain genuine inclusion.

Quantifiable efficiency improvements confirm digital investments in all the banks that were studied. The 30% to 40% cuts in processing times and the 25% cuts in operational costs (Nabil Bank Report, 2024) are very close to international standards for digitising banking (Chen & Zhang, 2023). RPA's effect at Nabil Bank is especially impressive: 65% of back-office tasks were automated, resulting in a 90% reduction in errors, which is better than the global average for similar implementations (Deloitte, 2024). But these gains are still mostly in cities. For example, rural branches have a 30% failure rate for digital transactions, which means that the benefits of efficiency are not yet evenly spread out.

The 45% rise in cybersecurity incidents (NRB, 2024) shows that digital banking risks are growing around the world (KPMG, 2024). Nepal's problem seems to be getting worse because of two things: the rapid growth of digital technology is outpacing the country's security infrastructure (as shown by Nabil's NPR 750 million security investment), and there aren't enough cybersecurity professionals in the country. This corroborates the caution issued by Gupta and Sharma (2023) and Benjamin et al. (2024) that developing economies frequently emphasise functionality over security in digital transformation, thereby engendering systemic vulnerabilities.

The 18-month average approval time for fintech solutions (NRB, 2024) shows that regulatory frameworks are struggling to keep pace with changes in technology. This is something that has been well-documented in emerging markets (Arner et al., 2023). Nepal's situation seems especially difficult because it has to modernise both its banking infrastructure and its regulatory systems simultaneously. The planned NPR 1.2 billion CBS upgrade at NBLis an example of the significant investment required to fix problems with old systems. This shows that full digital transformation across the sector will need to be done over the next 5–7 years.

The relationship between technology investment levels (15–20% of profits) and a 3–5% higher ROE (NRB, 2024) provides empirical support for ongoing digital transformation. However, Nepal's future must focus on three important areas that this study found: (1) closing the digital gap between rural and urban areas through partnerships in infrastructure, (2) comprehensive programs to improve the skills of the workforce, and (3) updating regulations to allow for innovation while managing risks. These priorities correspond with the proposed transformations in digital banking by Mastran (2021), Askri et al. (2025), and Shah et al. (2025), as Nepal progresses from the "emerging" to the "developing" stage of digital banking evolution.

This study provides a foundational analysis of the digital landscape in Nepalese banking. The strong positive associations observed between digital adoption and reported gains in efficiency and customer satisfaction suggest a relationship that merits further investigation. Future

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research employing quantitative methods and longitudinal data would be required to establish causality.

Conclusion

The banking industry in Nepal has seen tremendous changes as a result of the digital revolution, leading to notable improvements in client satisfaction, operational efficiency, and financial expansion. Standard Chartered Bank Nepal and Nabil Bank have led the way in the use of cutting-edge technologies like artificial intelligence-enabled banking mobile apps, robotic process automation (RPA) and neo-banking platforms. These organisations have demonstrated that smart spending on technology pays off big-time in terms of faster processing and cheaper running costs.

Nevertheless, the study also presents challenges that are likely to create a digital divide within the financial sector of Nepal. State-run banks remain far behind in the digital transformation journey, afflicted by obsolete core banking technology and weak technical architecture. The gap between the rural and urban sector is a serious issue as the rural customers are facing much less access to a reliable digital banking experience as compared to their urban counterparts, owing to connectivity issues and lower digital literacy levels. These disparities highlight the urgent need for targeted interventions and policy measures to ensure equitable access to digital financial services for all consumers.

As businesses are adopting digital process, the risk of cybersecurity incident is becoming more pronounced. The rate of incidents increases along with the volume of transactions. This highlights the importance of developing a strong security infrastructure with digital banking platforms. The digital transformation is not only about implementing technology but a complete change within the organization, upskilling of the workforce, and educating customers.

The banking industry of Nepal is at a crucial juncture. The progress made by institutions that allow other actors and sectors provides a model for change on a much bigger scale. However, to achieve this potential, it requires efforts from all stakeholders. Regulatory reforms that motivate innovation need attention of policymakers as a priority. Funding for scaling operations will need to be technology driven. National efforts should be made to raise digital literacy. The banking sector can be leveraged for inclusive economic growth in the digital age of Nepal if these priorities are addressed. Other developing economies facing similar transformation challenges can learn from Nepal.

The results of the current study contribute to the literature on digital banking transformation in emerging markets by providing both empirical evidence of successful implementations and actionable guidelines to overcome persistent barriers. Future studies ought to be longitudinal on the impacts of digital adoption and thorough analysis on strategies to bridge the urban-rural digital divide in banking.

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