

ROLE OF TECHNOLOGICAL INNOVATION AND FINANCIAL PERFORMANCE

A Thesis submitted to the Office of the Dean, Faculty of Management in partial
fulfillment of requirement for the Master's Degree

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CERTIFICATION OF AUTHORSHIP

I hereby corroborate that I have researched and submitted the final draft of dissertation entitled “**Role of Technological Innovation and Financial Performance**”. The work of this dissertation has not been submitted previously for the purpose conferral of any degrees nor it has been proposed and presented as part of requirements for any other academic purposes.

The assistance and cooperation that I have received during this research work has been acknowledged. In addition, I declare that all information sources and literature used are cited in reference section of the dissertation.

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ACKNOWLEDGEMENTS

This thesis, titled "**Role of Technological Innovation and Financial Performance**" has been prepared to fulfill the partial requirements for the Master of Business Studies (MBS) degree at Tribhuvan University. I would like to express my deepest gratitude to the Office of the Dean, Faculty of Management, Tribhuvan University, and Shanker Dev Campus for providing me with the opportunity to undertake this significant academic project. This experience has allowed me to delve deeply into the intersection of technological innovation and financial performance, broadening my understanding and enhancing my analytical skills in this vital area.

I am especially grateful to my supervisors, Keshav Chand and Dr. Dipak Mahat of Shanker Dev Campus, whose guidance and mentorship were instrumental throughout the research process. Their expertise and unwavering support were crucial in shaping the direction of this thesis, and I am profoundly appreciative of their constructive feedback and valuable insights. Their dedication to my academic growth and the time they invested in providing thoughtful advice and suggestions have greatly enriched the quality of this research, ensuring its successful completion.

Additionally, I would like to extend my sincere thanks to all those who contributed to this study in various capacities. I am particularly indebted to the financial institutions and organizations whose secondary data provided the foundation for this research. I also wish to acknowledge the encouragement and support from my seniors, colleagues, and the administration of Shanker Dev Campus, whose cooperation, insightful recommendations, and unwavering support played a significant role in the completion of this thesis. Their collective efforts have made this journey a rewarding and fulfilling experience.

Dipak Pandey

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LIST OF ABBREVIATIONS

ATM:	Automated Teller Machine
BFI:	Banks and Financial Institutions
EBL:	Everest Bank Limited
Fintech:	Financial Technology
HBL:	Himalayan Bank Limited
IB:	Internet Banking
MB:	Mobile Banking
NIMB:	Nepal Investment Mega Bank Limited
NRB:	Nepal Rastra Bank
OECD:	Organization for Economic Co-operation and Development
POS:	Point of Sale
QR:	Quick Response
RBV:	Research-Based View
ROA:	Return on Assets
ROE:	Return on Equity
SBL:	Siddhartha Bank Limited
SCT:	Smart Choice Technologies
SPSS:	Statistical Package for the Social Science
TAM:	Technology Acceptance Model
VISA:	Visa International Service Association

ABSTRACT

This thesis explores the relationship between technological innovation and financial performance in Nepalese commercial banks, focusing on major institutions such as Everest Bank, Himalayan Bank, Nepal Investment Mega Bank, Siddhartha Bank, and NIC Asia Bank. The study aims to assess the impact of technologies like mobile banking, internet banking, and ATMs on financial performance indicators, particularly Return on Assets (ROA) and Return on Equity (ROE), over the period from 2013/14 to 2022/23.

Utilizing both descriptive and analytical approaches, the research analyzes secondary data sourced from annual reports and official bank websites. The findings reveal mixed results, with technological advancements initially enhancing customer engagement but showing a limited and, at times, negative impact on financial performance. Correlation and regression analyses indicate significant negative relationships between ATMs, mobile banking, and ROA, while the impact on ROE remains statistically insignificant. The regression model's low explanatory power further suggests that factors beyond technological innovation play a crucial role in determining bank profitability.

The study concludes that while technological innovations have grown significantly in Nepalese banks, their effect on financial performance remains modest, highlighting the need for a balanced approach to technology investments. The implications for policymakers, banking institutions, and future researchers emphasize the importance of strategic planning and the exploration of additional factors influencing financial outcomes in the banking sector.

Key Words: *ROA, ROE, Technological Innovation, Mobile Banking, Internet Banking, ATM*

CHAPTER I

INTRODUCTION

1.1 Background of the study

The banking industry is regarded as the foundation of the economy's development. It facilitates the creation of goods and services by providing loans and liquidity for the development of new industries, as well as currency deposit and withdrawal capabilities. Technology has dramatically impacted banking activities. Bank use technology such as ATMS, internet banking, and mobile banking to cut costs, improving efficiency, productivity, and customer happiness. In this respect, banks' technology capabilities are essential for systematic research and long-term viability of banking activities (Omarini, 2018).

Technological innovation has transformed the banking sector in recent years, bringing about a fundamental shift in the way clients engage with their institutions. The purpose of this study is to investigate how technology innovation affects the banking industries and their financial performances. In particular, it looks on how different technology advancements-like chatbot driven by artificial intelligence, mobile and online banking, and internet banking have affected consumer attitudes and actions. The banking clients experience has significantly impacted by technological innovation. For instance, the advent of ATMs has improved accessibility and convenience for the cash withdrawal and deposit procedures. Similar to this, customer may now do a variety of banking tasks from the convenience of their homes or while they are on the road thanks to online and mobile banking. The general accessibility and convenience of banking services have been greatly improved by these improvements, which has raised customer satisfaction levels (Puschmann, 2017).

Banking technology has progressed steadily since the late 1960s, when the first Automated Teller Machine (ATM) was introduced, providing customers with new ways to access and manage their finance. The 1980s saw the emergence of electronic banking, with the development of online banking systems that enabled consumers to view their accounts and execute transactions via the internet. This was followed by the advent of mobile banking in 2000s, which allowed clients to conducts banking transactions via mobile devices. The 21st century has witnessed the growth of fintech

(financial technology) companies that use technology to provide new financial services such as peer-to-peer transfer, robo-advisors, and digital wallets. These fintech technologies are disrupting established banking methods and encouraging banks to innovate and improve their services to meet changing customer needs (Salampasis & Mention, 2018).

Good service quality can also help banks save money and improve their operational efficiencies. Satisfied customers are less likely to seek substantial assistance or complaint resolution, lowering the bank's overall operational costs. Bank that prioritizes services quality are more likely to innovate and adapt to changing consumer needs, ensuring their competitiveness and success in a rapidly changing sector. Hence, strong service quality is not only a differentiator, but an essential requirement for banks to survive and thrive (Kumar & Reinartz, 2016).

Rapid technology advancements in the banking sector have surely resulted in various benefits, including increased convenience, efficiency, and access to financial services. However, with these benefits come substantial issues and concerns that must be addressed. One of the primary concerns surrounding technological innovation in banking is security and privacy. Customers are increasingly aware of the hazards connected with cyber-attacks and data breaches as banking services become more digital and transactions are made online or via mobile devices. Banks are under pressure to put in place effective cybersecurity measures to protect client data and prevent unauthorized access to accounts. Failure to do so may results in financial losses for consumers and harm to banks' reputation (Ozili, 2018).

Although Nepal Bank Ltd. was the country's first bank when it opened for business in 1937, Nabil Bank Ltd. didn't introduce credit cards until the early 1990s, a full 53 years later. When it comes to the growth of online banking in Nepal, Himalayan Bank Ltd. was at the forefront of financial innovation when telebanking and the automated teller machine were introduced in 1995. It took the banking sector and its clients about 65 years after the first bank opened its doors for business to finally launch online banking in Nepal in 2002 (Kumari Bank Ltd.) (Mishra, 2008). Traditional banking methods are still widely used in Nepal, even though internet banking has been available for a decade. Even while most banks offer online banking in large towns like Kathmandu, Pokhara,

and Biratnagar, and most people in those areas have access to decent internet, most people still don't use it (Mishra, 2008).

There was a dramatic increase in the usage of online and mobile banking in Nepal by the year 2023. More than 17.6 million people in Nepal utilize mobile banking, according to latest statistics. With an increase of 1.66 percent over the prior year (Fiscal Nepal), this number has been rising consistently. With the expansion of mobile and broadband services, which have reached over 140% and 130% of the population, respectively, the usage of online banking has also grown (Kathmandu Post). Many initiatives by banks like the Nepal Rastra Bank (NRB) to encourage customers to use their cards instead of carrying around large amounts of cash have contributed to this expansion. There has been a significant shift in Nepal's digital payment system, with more and more people using mobile banking to pay bills and make payments using QR codes (OnlineKhabar English News) (Fiscal Nepal).

This study used the following sample banks to look at how technological innovation affects the financial performance of banks:

Everest Bank Limited

The year 1994 A.D. marked the founding of Everest Bank Limited. One of EBL's joint venture partners, Punjab National Bank, owns 20% of the company. Among Nepal's first financial institutions to implement the Any Branch Banking System (ABBS), Everest Banking Limited (EBL) stands out. Through its extensive network linked through the ABBS system, EBL offers customer-friendly services, allowing customers to conduct operational transactions from any of its branches. There are a total of 127 branches, 162 automated teller machines, 3 extension counters, and 32 revenue collection counters for the bank, these facilities support their customer base of over 1.3 million, providing extensive banking services across the country (SpotlightNepal) (Business 360°). Since its founding in 1994, the bank has served a wide range of customers, becoming one of the country's leading lending institutions. The bank's diverse clientele has contributed to the nation's economic, agricultural, and industrial growth. DP-online, i-banking, i-banking login, SMS banking, and utility bill payment are all part of EBL's e-banking offerings. Since this bank was the first in Nepal to implement an electronic ticketing system, customers have been able to purchase tickets

for Yeti Airlines online. The bank has also introduced new online payment methods, such as PSTN/NCELL/MOBILE/ADSL bill or in-person at the counter.

Himalayan Bank Limited

Himalayan Bank Limited (HBL) is among the most prominent privately-owned banks in Nepal. The user's claim lacks a reliable source to support it. The Bank was established in 1992 through a collaboration between prominent persons from Nepal, the Employees Provident Fund, and Habib Bank Limited from Pakistan. The bank began its operations in January 1993. Himalayan Bank is the inaugural commercial bank in Nepal, with a majority of its shares owned by the private sector of Nepal. The bank's main and corporate office is located in Kamaladi, Kathmandu. Following the acquisition of CBL, the Bank now serves clients through 176 Branch Offices, 20 Extension Counters, 264 ATM Booths, 7 Cash Recycler Machines, 17000+ remittance payment partners, and 6500+ POS businesses. This merger has strengthened the bank's position in the Nepalese banking industry. From its inception, the bank has been at the forefront of delivering a wide range of banking services that were previously unavailable in Nepal. HBL was the first to create products like the Premium Savings Account, HBL Proprietary Card, and Millionaire Deposit Scheme, as well as services like ATMs and Tele-banking. These offerings were highly successful in capturing the hearts of clients at that time. From its inception, the bank has prioritized inventive strategies and ensuring consumer satisfaction. HBL's remittance service has also proven helpful to Nepali nationals both in and out of the nation. Currently, HBL stands as Nepal's largest bank processing inbound remittances. Among the leading remittance service providers in Nepal, HBL has connections with financial institutions in the UK, Australia, USA, Japan, Israel, South Korea, Malaysia, Singapore, Portugal, Spain, and Hong Kong through its proprietary online money transfer software, Himal Remit. According to the Nepal Rastra Bank's Merger and Acquisition Policy, Himalayan Bank Limited has taken over Civil Bank Limited with a swap ratio of 100:80.28 (every 100 scrips of CBL, a shareholder will receive 80.28 scrips of HBL). The combined company will be known as "Himalayan Bank Limited" as of February 24, 2023.

Nepal Investment Mega Bank Limited

There are few commercial banks in Nepal as prominent as Nepal Investment Mega Bank Limited. The bank was founded in 1986 as a joint venture between Nepalese and Credit Agricole Indosuez. It was previously known as Nepal Indosuez Bank Ltd. Half

of the French company's shares were purchased by Nepalese investors in 2001. In 2023, it became Nepal Investment Mega Bank Limited by merging with Mega Bank Nepal. The two banks began operating together on January 11, 2023. After the merger with the Mega bank Limited it has 296 branches, 282 ATM counters and 64 Extension counters all over the Nepal. In 2008, Nepal Investment Bank began offering online banking services. An internal financial switching system has been established by the bank. Which offers many delivery methods for online transactions, including ATMs and POS terminals. The expansion of these services to new technology-based delivery channels including mobile banking, e-commerce payment gateways, and online banking is possible.

Siddhartha Bank Limited

One of the biggest private commercial banks in Nepal, Siddhartha Bank Limited (SBL) is the 18th commercial bank to receive a license from Nepal Rastra Bank. In December 2002, it began functioning. It offers full-service commercial banking and money transfers through its headquarters in Kathmandu and 196 branches and 226 automated teller machines (ATMs) around the country. The Nepal Stock Exchange lists the bank as a 'A' category firm, meaning that its shares are traded openly. As a result of its outstanding work and significant impact on Nepal's banking sector, Siddhartha Bank Limited has been honored with multiple accolades. The Banker, a prominent financial publication, named it "Bank of the Year," and it has received accolades for its social and economic impact from a number of other groups. In order to ease cross-border services including commerce and remittances, the bank has been keeping correspondent partnerships with numerous international banks from different nations. The bank's correspondents allow it to provide services in all major international currencies. Another well-known Nepalese remittance provider is SBL Remit. One of Nepal's commercial banks, Siddhartha Bank Limited (SBL), produces SBL Remit. Online money transfers, bank deposits, and cash pickup are just a few of the remittance options it provides. Many Nepalese banks and financial institutions work with SBL Remit, which also has a global footprint in places including the US, UK, and the Gulf.

NIC-Asia Bank Limited

Founded as NIC Bank on July 21, 1998, NIC ASIA Bank became the first commercial bank in Nepal to be capitalized at NPR 500 million. Following its merger with Bank of Asia Nepal on June 30, 2013, the bank was renamed NIC ASIA Bank. As of the

2022/2023 annual report, NIC ASIA Bank operates 231 branches, 14 extension counters, 15 branchless banking units, and 220 ATMs across Nepal, effectively covering all major financial centers in the country. The bank upholds core values such as meritocracy, transparency, professionalism, team spirit, and service excellence, which are integral to all its functions and actions.

NIC ASIA Bank stands as one of the largest private sector commercial banks in Nepal, distinguished by its capital base, extensive branch network, comprehensive ATM coverage, and substantial customer base. The bank's commitment to innovation is evident in its launch of an online portal for account creation, a pioneering initiative in the Nepalese banking industry. Additionally, NIC debit cards facilitate cash withdrawals, balance inquiries, and payments through the extensive VISA and SCT networks in Nepal and India. Since launching SMS Banking Service in 2005, NIC ASIA Bank has enabled customers to access their accounts via mobile phones, offering services such as balance inquiries, transaction history viewing, and cheque book and statement requests (NIC ASIA Bank, 2022/2023).

1.2 Statement of the problem

The banking industry in Nepal, much like the banking sector in many other parts of the world, has undergone major transformation as a result of technological enhancements. There has been a shift in the way that financial transactions are carried out as a result of the introduction of online banking, mobile banking, and automated teller machines (ATMs). These innovations have provided customers with convenience and accessibility while also promising better operational efficiency for banks. However, despite the broad deployment of these technologies, there is still a lack of empirical evidence regarding the impact that they have on the financial performance of banks in Nepal.

Berger's (2003) study examined how technological advances improve banking industry financial performance and operational efficiency. The study examines how technology adoption, such as automated operations and digital banking, lowers costs and enhances service. The study shows that technological progress increases productivity, profit margins, and economic efficiency, reinforcing the importance of innovation in bank success and competitiveness. Tiwari and Buse (2007) examine mobile banking's revolutionary potential and suggest strategic banking prospects. Mobile banking may

increase client reach, convenience, and engagement by offering financial services anytime, anyplace. Strategically, mobile banking may boost client loyalty, competitiveness, and income. The report emphasizes the relevance of mobile banking in banks' strategic planning to modernize processes and suit tech-savvy consumers' requirements.

Hernando and Nieto (2007) examined how internet delivery affects Spanish banks' financial performance. The study uses actual data to analyze how internet banking affects profitability, cost efficiency, and customer service quality. The findings show that banks using online channels improve operational efficiency and transaction costs, which boosts financial performance. The research shows that online banking streamlines banking operations and boosts banks' competitiveness and profitability in the digital age.

Al-Jabri and Sohail (2012) studied mobile banking uptake and its effects on the banking sector using the Diffusion of Innovation Theory. The study examines how relative advantage, compatibility, complexity, trialability, and observability affect consumer mobile banking adoption. The paper analyses these factors to show how mobile banking spreads across user groups and impacts the banking industry. The results show that mobile banking improves client convenience, financial inclusion, and bank competitiveness. The study emphasizes the importance of innovation dissemination in reforming traditional banking practices and digitalizing financial services.

Arunachalam et al. (2018) evaluated the literature on mobile and online banking and how technology promotes financial inclusion. Technological developments remove barriers to financial services, especially for disadvantaged communities in developing nations, according to various studies. Technology makes banking easier on mobile phones and the internet, empowering marginalized communities and increasing economic prospects. By offering cost-effective, safe, and convenient banking solutions, mobile and internet banking promotes financial inclusion, economic growth, and poverty reduction. Technology can bridge the financial divide and promote equitable growth, as this review shows.

Leidner and Kayworth (2006) studied how organizational culture, including values and beliefs, affects technological innovation implementation and effectiveness. They emphasize the relevance of understanding these dynamics in information systems

research since they affect technology progress. Recognizing this influence helps organizations match cultural values with technical goals, promoting innovation and performance. Therefore, exploring the moderating role of organizational culture can offer valuable insights into how companies might harness their culture to boost financial performance and technological innovation. Organizations can achieve innovation and financial success by cultivating a culture that encourages experimentation, cooperation, and constant learning.

Many are wondering how the fast development of banking technology, including as online and mobile banking, as well as automated teller machines (ATMs), would affect the bottom lines of Nepalese financial institutions. The impact of these technology advancements on important financial indicators, such as Return on Assets (ROA) and Return on Equity (ROE), has not been adequately studied, despite their broad adoption. Whether or not Nepalese banks' financial health improves as a result of increased use of online, mobile, and automated banking services is the main focus. Although these technologies have great potential to improve operational efficiency, lower transaction costs, and increase customer happiness, it is unclear how they will impact banks' financial performance. This lack of clarity calls for extensive research into the impact of online and mobile banking as well as automated teller machines on the efficiency and profitability of Nepalese banks (Sharma & Ghimire, 2020).

This study aims to shed light on whether the use of internet banking, mobile banking, and ATMs actually leads to increases in ROA and ROE by analyzing the financial data of Nepalese banks and investigating the extent of their technological integration. Additionally, it seeks to investigate the ways in which these technologies affect financial performance by looking at things like operational expenses, client acquisition, and service quality. Consequently, this study intends to fill a significant knowledge vacuum by investigating how online and mobile banking have affected the return on assets (ROA) and return on equity (ROE) of Nepalese banks. This study aims to shed light on the relationship between technological innovations and financial metrics. By doing so, it hopes to help the Nepalese banking industry make better strategic decisions and understand how it is evolving in the digital age (Koirala & Shrestha, 2021).

Not only does this study have important consequences for Nepal's banking sector, but it also has legislative, regulatory, and stakeholder implications for those working to

increase access to financial services and encourage technological innovation. This study helps us understand the dynamics of Nepal's banking sector better and offers useful insights for digital era strategic decision-making by illuminating the connection between technology adoption and financial performance. Hence, based on the provided statements this study aims to address the following issues specially in the context of technological innovation in the banking sector and its role in financial performance of banks in Nepalese market.

- i) How does technology innovation affect financial performance?
- ii) What is the relationship between technology innovation and financial performance?
- iii) What is the impact of technology innovation on financial performance?

1.3 Objectives of the study

The primary aim of the study was to ascertain the presence of financial innovation and its influence on the financial performance of banks. The study employed the following specific goals:

- i) To assess the technology innovation and financial performance.
- ii) To examine the relationship between technology innovation and financial performance.
- iii) To analyze the impact of technology innovation on financial performance.

1.4 Hypothesis

Four basic hypotheses have been drawn for the purpose of identifying relationship between dependent and independent variables in the study.

H1: There is a positive relationship between mobile banking and financial performance.

H2: There is a positive relationship between internet banking and financial performance.

H3: There is a positive relationship between ATM and financial performance.

1.5 Rationale of the study

The study provides banking institutions with priceless insights for making strategic decisions. To make educated judgements about adopting, implementing, and using technology breakthroughs, banks must understand how these innovations impact

financial indicators. Banks can attain a competitive advantage, boost operational efficiency, and provide better customer service by coordinating their technologies investments with their strategic goals. Technology could make banking services available to people who didn't have access to them before, which would help the economy grow and bring people together. Researchers in this field are trying to find the best ways to use technology to help banks reach more customers and make it easier for people to get to important financial services like savings accounts, loans, and payment systems (Berger, 2003).

Research on technological innovation in banking also helps shape policy and regulatory frameworks. Maintaining confidence in the financial system and encouraging new ideas and healthy competition are two of regulators' primary functions. Regulators can use research results to weigh the pros and cons of new technology, create suitable standards and guidelines, and establish a middle ground between innovation and prudential regulation (Arner et al., 2017).

Finally, it is critical for all parties involved in the banking ecosystem to comprehend the connection between technological advancement and financial success. Customers looking for safe and easy banking experiences and investors assessing the sustainability of financial institutions both rely on research findings to guide their decision-making. Helping stakeholders navigate the ever-changing banking market, research in this area explains how technology affects profitability, efficiency, risk management, and consumer happiness. Research on the impact of technological innovation on banking and financial performance is a key driver of development, innovation, and long-term economic prosperity.

1.6 Limitations of the study

The challenge of distinguishing the specific influence of technology innovation from other external factors arises due to the intricate nature of the banking environment. The banking business is impacted by a multitude of variables that extend beyond just technology improvements. Various economic factors, including interest rates, inflation, and overall economic growth, have a substantial impact on a bank's financial success. Regulatory changes, such as the implementation of new legislation or regulations that control the banking business, can also exert a significant influence. Moreover, the presence of market rivalry, the strategies employed by competitors, and changes in

consumer preferences can all impact the extent to which technological advancements contribute to financial success.

For instance, when a bank launches a novel mobile banking application, its triumph might be determined not solely by the app's characteristics and user-friendliness, but also by how effectively it satisfies client requirements in comparison to rival products. The adoption of the app may be influenced by economic situations, such as a recession, as users may choose financial security above embracing new banking technologies. Regulatory changes may impose additional compliance obligations that could impact the cost or practicality of adopting new technologies. External factors might complicate the connection between technical innovation and financial performance, making it difficult to credit changes in financial performance simply to technological improvements.

Measurements of financial performance may also be limited. Although ROA and ROE are extensively employed, they may not fully capture the influence of technological innovation on a bank's financial performance. Other financial measures including net income, asset growth, and cost-to-income ratio may provide light on technology innovation and financial performance. The study's concentration on ROA and ROE may not represent the long-term consequences of technology adoption, as technological innovation may take years to pay off. Thus, the study may need to include more financial performance measures to better assess how technology innovation affects Nepalese banking sector financial performance.

CHAPTER II

LITERATURE REVIEW

A literature review critically summarizes and evaluates relevant research. It entails finding, analyzing, and synthesizing relevant papers, theories, and concepts to comprehend the research area. A thorough literature evaluation helps researchers uncover knowledge gaps, establish their research's significance, and create a theoretical framework. It also contextualizes the research within scholarly discourse and supports methodology and data analysis (Fink, 2014).

2.1 Theoretical review

Innovation in technology occurs when new methods, tools, or products are created and used in a certain industry or field, leading to noticeable advances. It entails coming up with new ideas and putting them into action in order to enhance the performance of tasks or the delivery of goods and services (OECD, 2005). Technological innovation refers to the systematic development and implementation of novel technologies or enhancements to existing technologies with the aim of generating value for individuals, organizations, or society at large. Innovation encompasses the exploration, creation, and implementation of novel concepts, goods, procedures, or offerings that lead to technological improvements and contribute to both economic expansion and societal progression (Damanpour, 1991).

In the context of technological innovation, the role of innovation in the process of transforming ideas into goods or services that are commercially viable is emphasized. It entails the process of transforming ideas or discoveries into marketable products or services that satisfy the requirements and expectations of customers, which ultimately results in economic gains and advantages for organizations in terms of competition (Schumpeter, 1934).

Financial performance, in contrast, refers to the evaluation of a company's or organization's fiscal well-being and capacity to generate earnings within a certain timeframe. Indicators such as return on assets (ROA), return on equity (ROE), profit margins, and revenue growth are utilized to evaluate the efficiency and effectiveness of a company's operations and its capacity to create value for its stakeholders (Pandey, 2019). A business or organization's financial performance can be defined as its capacity

to meet its strategic goals through the efficient use of its financial resources and the generation of profit. Return on assets (ROA), return on equity (ROE), profit margins, and cash flow are all part of it, along with a slew of other financial indicators and metrics used to evaluate a company's efficiency, health, and profitability (Brigham & Houston, 2019).

What defines an organization is its culture, which includes its members' commonalities in terms of values, beliefs, attitudes, and actions. According to Schein (2010), it embodies the "personality" of the company and impacts decision-making, employee interactions, and the way work is completed, as well as interactions with external stakeholders. When it comes to the correlation between tech and bottom-line results, company culture can act as a moderator. Better financial results can be achieved through the acceptance and deployment of new technology, which can be facilitated by an inventive and supportive culture. Conversely, new technologies may not have the desired effect on financial performance if the culture is change-averse or does not prioritize innovation (Lee, 2000).

This study's theoretical framework can draw from a number of applicable theories:

Innovation diffusion theory:

According to Rogers's (2003) Innovation Diffusion Theory, we may use it as a guide to figure out how new tech gets spread about in a company or community. According to the hypothesis, there are a number of important criteria that determine whether an innovation is adopted:

- i. Perceived benefits: People or groups are more likely to use a new tool if they think it will help them. For instance, banks might start using mobile banking because it lets people bank from anywhere at any time.
- ii. Compatible: The new technology must work with the ways of doing things, the ideals we hold dear, and the needs we already have. For example, for internet banking to work, it needs to fit with the way the person lives and the way they normally do their banking.
- iii. Complexity: How hard people think it is to use a new tool can affect how quickly it is adopted. People are more likely to use technologies that they think are simple to use.

- iv. Trialability: Being able to try out new technology in small ways before committing to it fully can affect how quickly it is adopted. Giving people a free trial of a mobile banking app is one way to get them to use it.
- v. Observability: People's ability to see how the new technology can help them can affect how quickly they accept it. People may be more likely to use internet banking if they see other people doing it and getting benefits from it.

In your research on technical innovation and financial performance in Nepal's banking system, Innovation Diffusion Theory can explain mobile banking, online banking, and ATM usage. The hypothesis implies that these technologies' perceived benefits, compatibility with existing practices, complexity, trialability, and observability can impact uptake. If banks believe mobile banking would improve client convenience and operational efficiency, they may adopt it. According to the idea, organizational culture moderates this link. Innovative and change-friendly cultures are more likely to help adopt and deploy new technologies, improving financial performance. Understanding these patterns can help Nepalese banks use technology to improve their finances.

Research-based view (RBV) of the firms:

The Resource-Based View (RBV) of the Firm suggests that a firm's competitive advantage and financial success are influenced by its distinctive resources and capabilities (Barney, 1991). Within the scope of your study, investments in technology advancements such as mobile banking, online banking, and ATM technologies can be seen as crucial assets that enhance a company's competitive edge. These technologies have the potential to optimize operating efficiency, promote customer satisfaction, and facilitate the creation of new sources of revenue, all of which can result in enhanced financial performance. By examining how these technical investments contribute to the firm's entire resource base, you can obtain valuable insights into their influence on financial metrics such as return on assets (ROA) and return on equity (ROE).

The relationship between technological innovation and financial performance is significantly influenced by organizational culture. An environment that encourages and promotes new technologies can lead to better financial results when those technologies are adopted and utilized properly (O'Reilly & Chatman, 1996). Conversely, a culture that is unwilling to change might hinder efforts to innovate and restrict the potential advantages of new technologies. By examining the influence of organizational culture

on the acceptance and deployment of mobile banking, internet banking, and ATM technologies, you can gain a deeper understanding of how cultural aspects affect financial performance.

The technology acceptance model (TAM):

Users' adoption and usage of new technologies can be better understood with the help of the Technology Acceptance Model (TAM) (Davis, 1989). Perceived utility and perceived ease of use are the two primary determinants of users' behavioral intention to utilize technology, according to TAM. Perceived ease of use is the degree to which a user believes that interacting with a piece of technology will not need any effort on their part, whereas perceived usefulness is the degree to which a user believes that utilizing the technology would increase their performance or productivity.

Applying TAM to your study on ATM, mobile banking, and online banking will help you understand how users' attitudes and perceptions affect the adoption of these technologies and their impact on financial performance. Customers may be more receptive to using mobile banking if they see it as a practical solution that meets their needs in terms of accessibility and ease of use. Also, people are more likely to use mobile banking if they don't have any trouble doing so. You can learn more about the factors that influence technology adoption and how they affect financial performance by looking at them through the perspective of TAM.

Institutional theory:

Institutional Theory says that the bigger institutional environment, which includes rules and regulations, business standards, and societal expectations, has an effect on organizations (Scott, 2014). If you are studying how new technologies like mobile banking, internet banking, and ATMs are adopted and used in the banking industry, knowing how institutional forces affect this can help you understand how these technologies affect financial performance.

For instance, regulatory frameworks may require banks to use certain technologies or set standards for how they should be used, which can affect their choices to adopt them. Competitors' use of mobile banking, for example, can also affect how banks use new technologies and what decisions they make about them. People's assumptions about how easy and safe it is to use banking services can also lead to the development of technologies that meet these needs. It is possible to learn more about the factors that

lead to adoption and how they affect financial success by looking at how institutional forces affect the adoption and implementation of technological innovations in the banking sector.

2.2 Empirical review

Banks play a critical role in the economy, acting as key financial intermediaries that facilitate transactions and enable commerce. As such, there is a continually growing demand from individuals and businesses for banking services to meet their financial needs. For the banking industry, the emergence of digital technologies has brought about a revolutionary period. The way banks provide services to their clients has completely altered as a result of the technological revolution, with procedures now being more accessible, convenient, and efficient (Abuhasan & Moreb, 2021). It is now imperative for organizations of all sizes and in all industries to embrace this transformation in the ever-changing digital landscape of today. Banks need to be flexible and ready to continuously modify their business plans and operations to keep up with the rapid advancements in technology if they want to stay competitive and relevant.

The impact of technological adoption, including mobile banking, online banking, and developments in ATM technology, on important financial measures such as return on assets (ROA) and return on equity (ROE) is clearly visible. These advancements contribute to increased operational efficiency and higher consumer engagement, leading to concrete advantages for banks (Sharma & Gupta, 2018). Banks can now reach a wider audience and better service consumers in different parts of the world thanks to technological advancements that have expanded their market reach. One way that mobile banking has helped expand access to banking services for people without physical locations is by bringing these services to previously unbanked communities (Sharma & Gupta, 2021).

Mobile banking provides cost-saving advantages for banks by decreasing their dependence on traditional physical branches and the related operational costs. The evaluation emphasizes that mobile banking enables the mechanization of regular financial operations, resulting in more efficient processes and reduced transaction expenses. Additionally, mobile banking enables banks to access previously neglected communities without the necessity of expanding physical branches, hence enhancing

cost effectiveness (Smith & Johnson, 2018). The introduction of mobile banking increases client engagement and satisfaction. Mobile banking allows clients to access a wide range of banking services on their phones at any time and place, according to studies. Mobile banking offers customized financial management tools and personalized interactions, increasing consumer happiness and loyalty. Banks that have effectively implemented mobile banking platforms typically observe enhanced profitability in comparison to those that have not embraced this technology (Wang & Liu, 2018).

Banks may enhance their customer connections and foster loyalty by offering simple access to a diverse array of financial services via online platforms. Internet banking allows users to conveniently carry out transactions, access real-time account information, and utilize personalized financial management tools, resulting in increased satisfaction and client loyalty (Brown & Garcia, 2019). Banks gain a competitive edge from internet banking. Internet banking services help banks attract and keep customers, especially tech-savvy shoppers who value convenience and accessibility. Internet banking also lets banks access more customers beyond their branch network, helping them compete in a digitalized financial industry. Financial organizations see an uptick in operational efficiency and income production as a result of online banking (Zhang & Li, 2016).

By increasing both transaction volumes and fee income, automated teller machines (ATMs) help boost revenue production. By making it easier for customers to access banking services, such as cash withdrawals, outside of normal business hours, it increases customer satisfaction and loyalty. When compared to its rivals, it consistently achieves higher returns on equity (ROE) and return on assets (ROA) (Chen & Lee, 2017). Financial institutions that possess extensive ATM networks typically achieve greater revenue as a result of enhanced consumer convenience and improved accessibility. It aids in achieving cost reductions by diminishing the requirement for physical branches and teller transactions, resulting in decreased operational expenses. Strategically placing ATMs can attract new consumers and increase market penetration, leading to increased revenue and market share (Park & Kim, 2019). As per Kim and Lee (2017), New features and improvements in automated teller machine technology, like enhanced deposit automation and interactive self-service capabilities, boost productivity and happiness for customers. Banks can improve their financial

performance and competitive advantage through the invention of automated teller machines (ATMs), which allows them to differentiate their service offerings, attract new clients, and retain existing ones.

Financial institutions that allocate resources to digital banking technologies typically see superior levels of operational efficiency, cost reduction, and revenue growth in comparison to conventional banks. Digital banking improves consumer engagement and happiness through convenient access to banking services, personalized experiences, and innovative product offerings (Li & Zhang, 2019). The use of digital banking platforms and fintech solutions, as part of digital transformation projects, greatly influences the financial performance indicators of banks. The use of digital channels allows banks to gain a competitive edge by streamlining operations, reducing costs, and increasing market reach (Lee & Chang, 2021). Blockchain technology, robo-advisory services, and peer-to-peer financing are just a few examples of the fintech technologies that are shaking up the banking industry and changing the game. Banks can diversify their revenue streams, reduce costs, and improve customer experiences by partnering with fintech firms or creating their own fintech solutions. This can lead to improved financial performance. Banks may expand their customer bases, improve their risk management strategies, and test out new business models all thanks to fintech developments, which boost their profits and make them more competitive in the market (Patel & Desai, 2020)

Dangol (2021) revealed that the influence of online banking services is critical to the banking industry in ensuring customer satisfaction and boosting banks' financial success. Increase in user of internet banking and mobile banking services leads to increase in net profit margin and operating expenses ratio. Now-a-days mobile banking and internet banking gaining more popularity in the young generation because of its ease of use and because of the time management factors (Dhakal, 2023). Technological advancements are expected to have a favorable impact on the financial performance of the banking industry, leading to potential enhancements in profitability measures such as return on assets (ROA) and return on equity (ROE). Nevertheless, the degree of these enhancements can differ based on variables such as the rate of technology integration, the efficacy of implementation tactics, and the competitive environment within the banking sector (Mputhia, 2020). Also, Wachira (2010) showed the technological innovation have the positive impact on banking financial performance it helps the

improvement in profitability metrics such as return on assets (ROA) and return on equity (ROE).

Ali and Khan (2022) explored the correlation between the rate of technology integration in banks and their profitability measures. It found that effective implementation of technological innovations positively impacts ROA and ROE. The research underscores the need for banks to continuously adapt their strategies to leverage technology for improved financial outcomes.

Wajdi et al. (2020) examined how human resource competence, technology, and organizational culture moderate the effect of these factors on performance. The study concluded that technology and human resource competence improved organizational effectiveness. They also observed that organizational culture moderated this association. A strong organizational culture can boost the favorable effects of human resource competence and technology on organizational performance, the study found. Organizational culture enhances human resource capabilities and technology, improving performance. To maximize their benefits, investment in human resource development, technology, and a supportive and innovative organizational culture is crucial.

Table 1:

Summary of Literature Review Table

S.N.	Author(s)	Variables	Methodology	Major findings
1	Dhakal (2023)	Technology adoption (e.g., implementation of mobile banking, internet banking, ATM services, and other digital innovations), Operational efficiency of commercial banks (e.g., cost-to-income ratio, transaction	The study used statistical analysis, possibly including regression analysis, to examine the relationship between technology adoption and operational efficiency in commercial banks	Nepalese commercial banks operate more efficiently with technology. Mobile banking, internet banking, and ATMs reduced operational expenses and sped up transaction processing for banks. Effective technology deployment improves customer service efficiency and bank operational performance, according to the study.

		processing time, customer service efficiency).		
2	Ali and Khan (2022)	Technology integration rate in banks Profitability measures (Return on Assets (ROA) and Return on Equity (ROE)).	The study used a quantitative research design to examine the relationship between the rate of technology integration and profitability measures. It involved statistical analysis of financial data from banks to assess the impact of technological innovations on financial performance.	Effective implementation of technological innovations positively impacts both ROA and ROE. The study highlights the importance for banks to continuously adapt their strategies and leverage technology to achieve improved financial outcomes.
3	Dangol (2021)	Financial innovation (e.g., new financial products, digital banking services, fintech integration), Financial performance of commercial banks (e.g., Return on Assets (ROA), Return on Equity (ROE), profitability).	The study employed statistical analysis of financial data from commercial banks in Nepal, including regression analysis to measure the impact of financial innovation on financial performance.	Nepalese commercial banks benefit from financial innovation. ROA and ROE increased for banks that adopted digital banking and new financial products. The report stressed the need for financial services innovation to boost bank profitability and competitiveness.
4	Lee and Chang (2021)	Digital transformation initiatives (e.g., implementation of digital banking services, use of advanced technologies like AI and blockchain),	The study utilized financial data analysis and surveys to measure the impact of digital transformation initiatives on financial performance metrics in banks.	Bank digital transformation improves financial performance. Advanced digital technologies boosted ROA and ROE for banks. Digital revolution boosted profits and efficiency. The report stressed the need of investing in digital

		Financial performance (e.g., Return on Assets (ROA), Return on Equity (ROE), profitability, cost efficiency).		technology to stay competitive and boost profits.
5	Sharma and Gupta (2021)	Technological innovations in banking and financial institutions, financial performance	A qualitative review involves the systematic collection and analysis of non-numerical data, such as text, to understand concepts, opinions, or experiences related to technological innovations in banking and financial institutions.	The study indicated that mobile banking improves financial inclusion in underdeveloped nations. Mobile banking boost access for unbanked people, lower transaction costs, and improve financial inclusion. The study also emphasizes mobile banking's significance in financial literacy and access to other financial services.
6	Abuhasan and Moreb (2021)	Digital transformation initiatives (e.g., implementation of digital banking services, mobile banking, internet banking), Customer experience (e.g., customer satisfaction, customer engagement, perceived ease of use).	The study employed surveys or questionnaires to collect data from customers of Palestine banks to measure their experiences with digital banking services.	Digital transformation in Palestine banks improved customer experience. Customers were happier and more engaged with digital banking. Customer satisfaction improved due to these digital services' perceived simplicity of use.
7	Wajdi et al. (2020)	Human resource capability, Technology, Organizational performance,	The study employs a quantitative methodology, using statistical analysis to investigate the	Human resource capacity and technology improve organizational effectiveness, the study revealed. Organizational culture

- | | | | | |
|----|-------------------------|---|---|---|
| | | Organizational culture | relationships between human resource capability, technology, and organizational performance, and to examine the moderating effect of organizational culture | considerably moderates this link, with supporting cultures amplifying beneficial benefits and resistive cultures hindering them. To maximize the benefits of human resources and technical investments, a flexible and supportive culture is essential. |
| 8 | Mputhia (2020) | Technological innovations (e.g., mobile banking, internet banking, ATM services), Financial performance of banks (e.g., Return on Assets (ROA), Return on Equity (ROE)) | The study utilizes a quantitative methodology, employing statistical analysis to examine the relationship between technological innovations and financial performance. Data were collected from banks in Kenya. | The study indicated that technology advancements improved Kenyan banks' financial performance. The results reveal that banks that invest in mobile banking, internet banking, and ATM services have greater ROA and ROE. |
| 9 | Patel and Desai (2020) | Fintech innovations (e.g., blockchain technology, mobile banking, artificial intelligence, peer-to-peer lending), Various aspects of banking performance (e.g., operational efficiency, customer satisfaction, profitability) | The study employs a qualitative method through a literature review. This involves systematically examining and synthesizing existing research studies to understand the role and impact of fintech innovations in the banking sector. | The study revealed that fintech innovations boost banking performance by enhancing operational efficiency, cost reduction, and client happiness. It analyzed fintech trends and breakthroughs, discussed their practical applications in banking, and highlighted regulatory and cybersecurity dangers connected with adopting these technologies. Fintech might change the financial business, according to the study. |
| 10 | Brown and Garcia (2019) | Internet banking adoption, financial performance | The study employed a quantitative method, specifically a meta- | The meta-analysis quantified how internet banking usage affects profitability, |

- analysis. Meta-analysis is a statistical technique for combining the findings from multiple studies to generate a more precise estimate of the effect of an intervention or variable.
- Meta-efficiency, and consumer satisfaction. It also discovered elements that modify or alter this link, helping banks and policymakers.
- 11 Park and Kim (2019) ATM networks, financial performance
The study employed a qualitative method, specifically a literature review
The study concluded that ATM networks boost financial performance. The review may have shown how ATM networks improve bank efficiency, cost savings, and customer happiness. It also covered banking ATM network expansion and management difficulties and opportunities.
- 12 Li and Zhang (2019) Digital banking adoption, financial performance
The study employed a qualitative method, specifically a review of empirical evidence
Digital banking use improved financial performance, according to the report. The review may have shown how digital banking increases bank efficiency, costs, and customer happiness. It also addressed cybersecurity and regulatory compliance issues related to digital banking.
- 13 Sharma and Gupta (2018) Financial performance, technological innovations in banking
The methodology for this review likely involved a qualitative approach, focusing on summarizing and analyzing existing literature on
Mobile banking, online banking, and ATM technology improve financial performance, according to the analysis. These technologies may boost operational efficiency and technological

- innovations in banking consumer engagement, and their impact on improving bank finances. financial performance.
- 14 Smith and Johnson (2018) Mobile banking, financial performance The study employed a quantitative research design. The review showed how mobile banking has affected efficiency, profitability, and consumer happiness. It also addresses the obstacles and prospects of mobile banking uptake in the banking industry.
- 15 Wang and Liu (2018) Mobile banking adoption, financial performance The study employed a descriptive and quantitative research design. The review showed that mobile banking adoption rates affect profitability, efficiency, and customer happiness. The elements that affect mobile banking adoption and banking industry financial performance have also been explored.
- 16 Chen and Lee (2017) ATMs, financial performance The study employed a systematic review methodology, where the researchers systematically searched for and reviewed existing studies and research articles related to the role of ATMs in enhancing financial performance. The study has probably discovered a beneficial impact of ATMs on financial performance through the enhancement of efficiency, reduction of expenses, and increase in consumer convenience. ATMs are regarded as a vital technology in the banking industry, augmenting competitiveness and profitability.
- 17 Kim and Lee (2017) ATM innovation, financial performance The study employed a systematic review methodology, where the researchers systematically searched for and ATM advances improve efficiency, cost savings, and customer happiness, which may have boosted financial success in the study. Some ATM improvements that

			reviewed existing studies and research articles related to ATM innovation and financial performance	have the biggest impact on financial performance may have been emphasized, helping banks invest in ATM technology.
18	Zhang and Li (2016)	Internet banking, bank's financial performance	The study employed a descriptive and literature review methodology, where the researchers reviewed existing studies and research articles related to the impact of internet banking on banks' financial performance	The study's findings suggest that online banking has a favorable effect on banks' bottom lines by increasing productivity, decreasing operational expenses, and delighting customers. Banks perceive online banking as a competitive differentiator in the modern information era.
19	Wachira (2010)	Technological innovation, financial performance	The study employed a quantitative research design, using survey data or secondary data from commercial banks in Kenya.	Technology may have improved Kenyan commercial banks' financial performance, according to the study. ROA and ROE are higher for banks that invest in and embrace innovative technologies. The study may have also examined which technological developments had the most impact on financial performance, presenting banks with recommendations to increase performance through technology adoption.

2.3 Research gap

Although there has been a lot of research done worldwide on how new technologies affect financial performance, there is still a significant lack of studies that explicitly look at this relationship in Nepal's unique social, economic, and technological setting. Although the literature now in publication offers insightful analysis of broad patterns, its relevance to the banking sector in Nepal is questionable because of a number of

particulars. Restricted digital infrastructure, distinct consumer behaviors, and particular regulatory constraints are features of Nepal's banking system that set it apart from the more industrialized economies where the majority of research has been undertaken.

Given the quick development and uptake of technology like ATMs, mobile banking, and internet banking in Nepal, this disparity is especially noticeable. The difficulties and possibilities these technologies offer in the Nepalese context are still not fully understood due to a dearth of targeted research. The best way to apply and utilize these technologies to improve the financial performance of Nepalese banks while taking advantage of regional opportunities and limits is frequently overlooked in current studies.

In order to close this gap, this paper offers a thorough analysis of how technology improvements have affected Nepali banks' financial performance. In doing so, it hopes to provide useful perspectives and suggestions catered to the particular requirements and circumstances of the banking industry in Nepal. This targeted analysis will make a substantial contribution to the body of knowledge by assisting researchers, policymakers, and banking professionals in comprehending the complex impacts of technological advancements in the context of developing nations and informing strategic decision-making to enhance financial outcomes in Nepal's banking sector.

CHAPTER III

RESEARCH METHODOLOGY

Research methodology establishes a fundamental structure for carrying out the study with the aim of achieving the set objectives. This study aims to investigate the transformative role and impact of technological innovation on financial performance of the banking sector. The selection of a qualitative research design approach, along with descriptive and inferential statistics, was made in order to accomplish this objective.

3.1 Research design

Creswell (2014) defined research design as the "plan or proposal for conducting research, which encompasses the intersection of philosophy, strategies of inquiry, and specific methods". This definition highlights the all-encompassing aspect of study design, which includes the underlying philosophical principles, methodological approaches, and specific methods for gathering and analyzing data.

Kerlinger and Lee (2000) defined research design as the systematic and strategic framework for conducting investigations in order to gain answers to research questions and effectively manage variability (p. 14). This emphasizes the significance of carefully organizing and arranging the research in order to manage variables and guarantee the accuracy and consistency of the results.

The study has been conducted using two approaches: descriptive and casual comparative. The descriptive technique has primarily been employed for the conceptualization of the problem. The analytical approach utilizes financial and statistical instruments to determine the outcome. The study focuses on descriptive and analytical research designs.

3.2 Population and sampling procedure

In Nepal, commercial banks are considered to be the best financial organizations. The Nepal Rastra Bank (NRB) oversees all of the country's banks and financial institutions (BFIs). The BFIs have been categorized by NRB into four main groups. "A" Class Commercial Banks, "B" Class Development Banks, "C" Class Finance Companies, and "D" Class Microfinance Companies. 20 'A' class commercial banks exist in Nepal as of Ashad's end, 2080 BS [mid-July 2023], they are the total population for the study. Among 20 commercial bank, five banks are used as a sample banks.

3.3 Nature and sources of data collection

In this research investigation, secondary data is utilized to obtain essential information. This data is collected from existing sources, specifically the annual reports and official websites of the sample banks, to gather relevant financial and operational data. These auxiliary sources provide a comprehensive overview of the banks' performance, facilitating an in-depth analysis of the variables under study. By leveraging secondary data, the research benefits from established and credible information, ensuring the accuracy and reliability of the findings. This approach not only saves time and resources but also enhances the robustness of the research by utilizing data that has already been validated and published.

3.4 Methods of analysis

For the purpose of this study, secondary method was utilized. Both the websites of the banks and the annual reports that were issued by the banks that were sampled were used as secondary sources of information. The information that was gathered was processed and analyzed with the help of SPSS. This included coding the data, revising the data, and tabulating the data. All of these things are being done with the intention of making the information more visible and comprehensible to other individuals. There have been a variety of quantitative approaches and statistical tools utilized in order to extract the most important aspects of the research data and interpret them in a manner that is meaningful. Some of the statistical tools are:

i. Correlation analysis

Correlation analysis is a statistical technique employed to assess the magnitude and direction of the association between two numerical variables. Correlation analysis is an invaluable statistical method that offers useful insights into the correlations between variables. Proper utilization of correlation analysis, while taking into account its assumptions and limits, is crucial for deriving precise and significant conclusions from data. One way to find the Karl person correlation coefficient (r) between two series of variables x and y is to use the following formula:

$$r = \frac{n\sum xy - \sum x \cdot \sum y}{\sqrt{n\sum x^2 - (\sum x)^2} \sqrt{n\sum y^2 - (\sum y)^2}}$$

Where,

r = Correlation coefficient

n = no. of year

Σx = Sum of series X

Σy = Sum of series Y

Σxy = Sum of product X and Y

$(\Sigma x)^2$ = Sum of square of series X

$(\Sigma y)^2$ = Sum of square of series y

The correlation coefficient r can vary from -1 to 1.

$r=1$: This signifies a perfect positive correlation. In a precisely linear relationship, the other variable increases as the first variable increases.

$r=-1$: This signifies a perfect negative correlation. In a precisely linear relationship, the other variable decreases as one variable increases.

$r=0$: This suggests that there is no correlation. The variables do not exhibit a linear relationship; modifications in one variable do not anticipate modifications in the other.

ii. Multiple regression analysis

A statistical method known as multiple regression analysis is employed to investigate the correlation between one dependent variable and two or more independent variables. This method enhances the comprehension of the simultaneous influence of multiple factors on an outcome by incorporating multiple predictors, which is a refinement of simple linear regression. The primary goal is to forecast the dependent variable by utilizing the values of the independent variables. The regression equation for multiple regression analysis is expressed as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n + e$$

Where,

Y = Dependent variable

β_0 = Intercept

$\beta_1, \beta_2, \dots, \beta_n$ = Coefficient of the independent variable

e = Error term

The primary aim of this study is to estimate the impact of several independent variables (mobile banking, internet banking, ATM) on the value of the dependent variables (ROA and ROE). The regression equation represents the relationship between the profitability of Y and the variables MB, IB, and ATM.

This has been utilized to examine the correlation between independent factors and return on assets (ROA).

$$ROA = \beta_0 + \beta_1 MB + \beta_2 IB + \beta_3 ATM + \dots + e$$

This has been utilized to examine the correlation between independent factors and return on assets (ROE).

$$ROA = \beta_0 + \beta_1 MB + \beta_2 IB + \beta_3 ATM + \dots + e$$

3.5 Research Framework and definition of variables

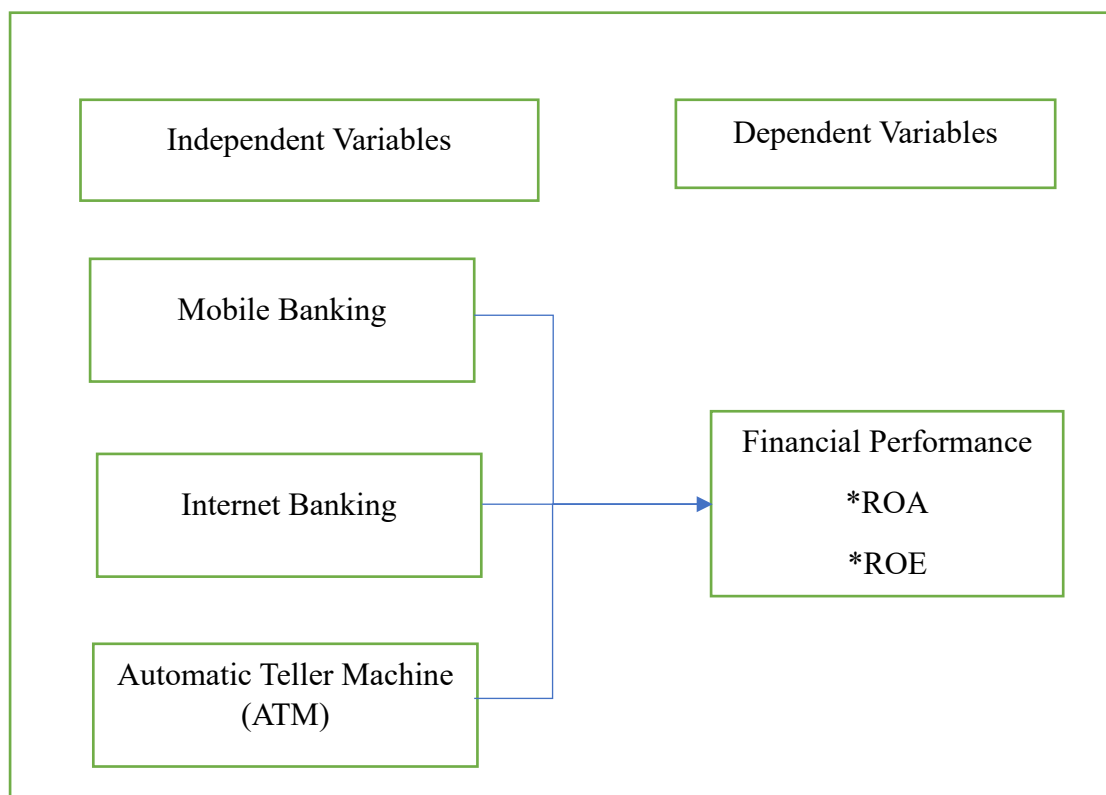


Figure 1:

Diagram of the Theoretical Framework

Sources: Based on (Dangol, 2021) and (Mputhia, 2020).

i. Mobile banking

Mobile banking is the practice of using a mobile device, like a smartphone or tablet, to conduct financial transactions and activities from a distance. Customers can simply and securely access their bank accounts, perform financial transactions, and manage their finances from any location with an internet connection. The functionalities of mobile banking are: Account Management, Fund Transfers, Bill Payments, Mobile Deposits, Alerts and Notifications, Mobile Wallet Integration etc. Mobile banking uses mobile phones to settle financial transactions. Mobile banking allows financial companies to reach new clients and grow their market. Mobile banking minimizes transaction costs by eliminating the requirement for customers to visit a bank branch for non-cash withdrawals and deposits. Now-a-days most of the Nepalese individuals use mobile banking, all commercial banks employing the service. Akhtar and Nguyen (2020) discovered that mobile banking improves emerging market banks' financial performance. They found that mobile banking improves efficiency, operational expenses, customer satisfaction, and market reach. Effective mobile banking solutions boost banks' ROA and ROE.

ii. Internet Banking

Internet banking, sometimes called online banking or e-banking, is the electronic platform offered by banks and financial institutions that enables consumers to carry out a range of banking operations and services over the internet. Internet banking offers individuals convenient and safe access to their bank accounts and financial services from any location with an internet connection, whether a computer, smartphone, or tablet. The key features and functionalities of internet banking are: Account Management, Fund Transfers, Bill Payments, Online Statements, Account Alerts and Others additional Services etc. A number of studies show that internet banking is good for banks' finances, especially when it comes to Return on Assets (ROA) and Return on Equity (ROE). Hernando and Nieto (2007) found that the adoption of internet banking significantly improved ROA and ROE in a sample of Spanish banks from 1994 to 2002. Additionally, Tunay et al. (2015) demonstrated a significant relationship between internet banking and financial performance for banks across 30 European countries between 2005 and 2013.

Mobile and internet banking both enable online financial transactions but differ in their delivery. Mobile banking, accessed via smartphones and tablets, offers on-the-go

services like account management and bill payments, improving efficiency and financial metrics such as ROA and ROE, especially in emerging markets (Akhtar & Nguyen, 2020). Internet banking, available through computers and mobile devices, provides extensive online services and enhances ROA and ROE by boosting operational efficiency and customer satisfaction (Hernando & Nieto, 2007; Tunay et al., 2015). Both technologies improve financial performance but address different user needs and banking processes.

iii. Automatic Teller Machine (ATM)

An Automated Teller Machine (ATM) is an electronic apparatus that allows consumers to carry out diverse banking activities without the requirement of human intervention or physically going to a bank office. Automated Teller Machines (ATMs) are commonly seen in public areas such as shopping malls, airports, train stations, street corners, and bank branches. They offer convenient round-the-clock access to banking services. The key functionalities of ATMs are: Cash Withdrawals, Balance Inquiries, Deposits, Transfers, Bill Payments, PIN Changes and Mini Statements etc. ATMs play a crucial role in boosting the financial performance of banks by enhancing service delivery, reducing operational costs, and increasing transaction efficiency. Noor et al. (2019) found that ATMs promote operational efficiency by decreasing transaction costs and enhancing customer service. This, in turn, improves profitability and financial performance indicators like as return on assets (ROA) and return on equity (ROE). ATMs play a crucial role in enabling banks to extend their coverage and offer round-the-clock service, resulting in greater transaction volumes and more fee revenue.

iv. Financial performance

Assessing the health and sustainability of banks involves analyzing their financial performance, with metrics such as Return on Assets (ROA) and Return on Equity (ROE) serving as important indicators in this review. As per the study of Stefko et al. (2021) ROA and ROE as key indicators of financial performance. The study emphasizes that these measures are crucial for assessing the financial health and value creation capabilities of companies, particularly in the Czech and Slovak contexts. Also, the study of Tamimi and Jaradat (2019) and Farah (2020) finds that both ROE and ROA are effective profitability measures to evaluate bank performance.

Return on assets (ROA) is a metric that assesses a bank's effectiveness in generating profits from its assets, revealing how efficiently it utilizes its resources to generate revenues. A higher return on assets (ROA) indicates improved efficiency in utilizing assets and increased profitability. Conversely, Return on Equity (ROE) assesses a bank's profitability by quantifying its capacity to make profits for its shareholders' investment in the company. A higher return on equity (ROE) signifies that the bank is efficiently utilizing its equity to produce profits.

Ultimately, it is crucial for banks to maintain robust financial performance in order to ensure profitability, attract investors, and play their vital function as critical intermediaries in the economy. Stakeholders can make educated decisions to promote the growth and stability of banks by analyzing financial performance indicators such as Return on Assets (ROA) and Return on Equity (ROE) and comprehending the underlying factors that impact them.

CHAPTER IV

RESULTS AND DISCUSSION

As a result, this chapter comprises the data's analysis and interpretation. Its goal is to examine the information gathered and display the results in a way that aligns with the goals. An important stage in any research endeavor is the presentation and analysis of data. Data must be organized coherently and structured into tables for presentation. In contrast, analysis seeks to illustrate financial data through tables and/or graphs in order to support suggestions for remedial measures. To achieve the study's goals, it makes use of a variety of statistical and financial techniques. After that, the chapter presents the conclusions and outcomes from the descriptive and inferential analyses.

4.1 Descriptive analysis

The primary characteristics of a dataset can be summed up and described using the descriptive analysis method. It offers basic data features and summaries, frequently in the form of tables, graphs, and charts. Descriptive analysis provides a thorough picture of the dataset by assisting in the understanding of the data's variability, central tendency, and distribution. Calculating statistical measures from the data, such as the Mean, Standard Deviation (S. D), Min and Max is considered descriptive analysis for the purposes of this research.

Table 2:

Descriptive Analysis of Survey

Variables	Mean	S. D	Min	Max
ROA	1.4736	0.39362	0.47	2.30
ROE	15.6438	4.59910	4.65	27.60
Mobile Banking	244872.58	289882.264	8766	1289354
Internet Banking	178099.18	178386.944	2478	878988
ATM	152.24	112.374	61	517

Source: Researcher's survey 2024

The Return on Assets (ROA) over the 10-year period showed a range from a minimum of 0.47 to a maximum of 2.30. The average ROA recorded was 1.4736, indicating that on average, the companies or entities in the study generated a return of 1.4736% on their assets. The standard deviation of 0.39362 suggests that the ROA values varied

moderately around the mean. This variability indicates that while some entities achieved higher returns on their assets, others performed less well, but the degree of fluctuation was not extreme. For Return on Equity (ROE), the data recorded a minimum value of 4.67 and a maximum of 27.60. The average ROE over the 10 years was 15.6438, which means that, on average, the entities generated a return of 15.6438% on their equity. The standard deviation of 4.59910 indicates a relatively high level of variability in ROE, suggesting that there were significant differences in the profitability of equity among the entities. This higher standard deviation reflects that while some entities were able to achieve very high returns on their equity, others had much lower returns.

The average number of mobile banking users over the period was 244,872.58. However, there was a large range in the number of users, from a minimum of 8,766 to a maximum of 1,289,354. The standard deviation of 289,882.264 highlights a very high level of dispersion around the mean, indicating significant variability in the number of mobile banking users. This large standard deviation suggests that user adoption of mobile banking varied widely, with some periods or entities having significantly more users than others. For internet banking users, the average number recorded was 178,099.18, with the number of users ranging from a minimum of 2,478 to a maximum of 878,988. The standard deviation was 178,386.944, almost equal to the mean, indicating a high level of variability in the data. This suggests that the adoption of internet banking also varied greatly over the period or across entities, with some periods or entities having a much larger user base compared to others. The average number of ATM users was recorded at 152.24, with a minimum of 61 and a maximum of 517 users. The standard deviation of 112.347 shows substantial variability in ATM usage, indicating that the number of ATM users fluctuated significantly. This fluctuation could be due to various factors such as changes in user preferences, availability of ATMs, or other external factors impacting ATM usage.

Therefore, the data from Table 2 indicates that there is considerable variability in financial performance metrics (ROA and ROE) as well as in the adoption and usage of various banking technologies (mobile banking, internet banking, and ATMs). This variability can provide insights into the factors influencing financial performance and technology adoption in the banking sector.

4.2 Position of teleological innovation

Table 3:

Financial and Digital Banking Performance of EBL

Year	ROA	ROE	Mobile Banking	Internet Banking	ATMs
2013/14 (2070/71)	2.25	24.75	85641	88231	74
2014/15 (2071/72)	1.85	20.57	119898	95320	80
2015/16 (2072/73)	1.61	18.31	167857	105431	87
2016/17 (2073/74)	1.72	17.71	189356	115430	90
2017/18 (2074/75)	1.78	16.00	223899	130210	113
2018/19 (2075/76)	1.80	17.33	280433	166567	122
2019/20 (2076/77)	1.36	13.50	360599	200485	124
2020/21 (2077/78)	0.84	8.56	444839	241310	138
2021/22 (2078/79)	1.08	10.77	502775	290448	156
2022/23 (2079/80)	1.34	13.25	963885	349592	162

Source: Researcher's survey 2024

Based on the above Table 3, the position of profitability with the help of technological innovation (Mobile banking, Internet banking & ATM) and users are mixed up and maintaining fluctuations too. The return on assets (ROA) ratio measures how effectively a company can earn a return on its investment in assets, indicating the efficiency of asset utilization in generating profit. On the other hand, the return on equity (ROE) ratio measures how well a company can generate profit from its shareholders' equity, reflecting the effectiveness of management in using equity investments to grow the company. In 2013/14 ROA is 2.25 and ROE is 24.75, in 2014/15 ROA is 1.85 and ROE is 20.57, in 2015/16 ROA is 1.61 and ROE is 18.31, in 2016/17 ROA is 1.72 and ROE is 17.71, in 2017/18 ROA is 1.78 and ROE is 16.00, in 2018/19 ROA is 1.80 and ROE is 17.33, in 2019/20 ROA is 1.36 and ROE is 13.50, in 2020/21 ROA is 0.84 and ROE is 8.56, in 2021/22 ROA is 1.08 and ROE is 10.77 and in 2022/23 ROA is 1.34 and ROE is 13.25. The provided data on ROA and ROE from 2013/14 to 2022/23 shows an initial decline in both asset utilization efficiency and equity profitability, with ROA dropping from 2.25 to 1.61 and ROE from 24.75 to 18.31 by 2015/16. Despite slight improvements and stabilization around 2016/17 to 2018/19, both metrics experienced significant declines again in 2019/20 and 2020/21, possibly due to external economic factors or internal challenges. The adoption of technological

innovations like mobile banking, internet banking, and ATMs likely contributed to initial fluctuations but eventually supported a gradual recovery, with ROA improving to 1.34 and ROE to 13.25 by 2022/23. This indicates that while the company faced considerable challenges, particularly around 2020/21, it has managed to regain some efficiency and profitability over time.

Based on the above results in Table 3, the position of technological innovation and the users are growing up. Starting from the year 2013/14 the number of ATMs were 74 and in the year 2022/23 the number of ATMs expands to 162. And similarly Mobile banking and Internet banking users in 2013/14 were 85641 and 88231 respectively and in 2022/23, these expand to 963885 and 349592 respectively which are also growing faster day by day. This result shows the Everest Bank Limited's achievement in expanding technological innovation and its importance in attracting more customers in this computerized world.

Table 4:

Financial and Digital Banking Performance of HBL

Year	ROA	ROE	Mobile Banking	Internet Banking	ATMs
2013/14 (2070/71)	1.3	15.76	9088	83567	78
2014/15 (2071/72)	1.34	18.82	18776	97879	80
2015/16 (2072/73)	1.94	21.94	34445	126775	84
2016/17 (2073/74)	2.03	18.61	65728	156798	93
2017/18 (2074/75)	1.61	13.27	89323	166778	105
2018/19 (2075/76)	2.04	17.28	138453	178665	122
2019/20 (2076/77)	1.84	14.71	178604	190718	138
2020/21 (2077/78)	1.86	14.89	230399	203584	144
2021/22 (2078/79)	1.09	10.76	297215	217318	156
2022/23 (2079/80)	0.47	4.65	383408	231979	264

Source: Researcher's survey 2024

Based on the above Table 4, the position of profitability with the help of technological innovation (Mobile banking, Internet banking & ATM) and users are mixed up and maintaining fluctuations too. The return on assets (ROA) ratio measures how effectively a company can earn a return on its investment in assets, indicating the efficiency of asset utilization in generating profit. On the other hand, the return on

equity (ROE) ratio measures how well a company can generate profit from its shareholders' equity, reflecting the effectiveness of management in using equity investments to grow the company. In 2013/14 ROA is 1.3 and ROE is 15.76, in 2014/15 ROA is 1.34 and ROE is 18.82, in 2015/16 ROA is 1.94 and ROE is 21.94, in 2016/17 ROA is 2.03 and ROE is 18.61, in 2017/18 ROA is 1.61 and ROE is 13.27, in 2018/19 ROA is 2.04 and ROE is 17.28, in 2019/20 ROA is 1.84 and ROE is 14.71, in 2020/21 ROA is 1.86 and ROE is 14.89, in 2021/22 ROA is 1.09 and ROE is 10.76 and in 2022/23 ROA is 0.47 and ROE is 4.65. The data on ROA and ROE from 2013/14 to 2022/23 reveals fluctuations in profitability, reflecting the impact of technological innovations like mobile banking, internet banking, and ATMs. ROA initially increases from 1.3 to 2.03 by 2016/17, indicating improved asset utilization efficiency. However, it then fluctuates and declines sharply to 0.47 by 2022/23. Similarly, ROE rises from 15.76 to 21.94 by 2015/16, showing strong equity profitability, but subsequently drops significantly to 4.65 by 2022/23. These trends suggest that while technological advancements initially enhanced profitability, the company faced challenges in maintaining consistent efficiency and profitability, leading to mixed results and significant declines in the later years.

Based on the above results in Table 4, the position of technological innovation and the users are growing up. Starting from the year 2013/14 the number of ATMS were 78 and in the year 2022/23 the number of ATMS expands to 264. And similarly Mobile banking and Internet banking users in 2013/14 were 9088 and 83567 respectively and in 2022/23, these expand to 383408 and 231979 respectively which are also growing faster day by day. This result shows the Himalayan Bank Limited's achievement in expanding technological innovation and its importance in attracting more customers in this computerized world.

Table 5:*Financial and Digital Banking Performance of NIMB*

Year	ROA	ROE	Mobile Banking	Internet Banking	ATMs
2013/14 (2070/71)	2.3	27.6	11000	78667	77
2014/15 (2071/72)	1.9	24.8	19000	97668	82
2015/16 (2072/73)	2	26	30000	134566	82
2016/17 (2073/74)	2.1	19.1	43000	156778	98
2017/18 (2074/75)	1.50	12.82	64764	176236	104
2018/19 (2075/76)	1.79	13.00	97544	230810	117
2019/20 (2076/77)	1.19	8.92	146915	302284	125
2020/21 (2077/78)	1.56	11.04	221274	395890	130
2021/22 (2078/79)	1.55	11.17	333270	518483	132
2022/23 (2079/80)	0.83	6.69	501951	679038	282

Source: Researcher's survey 2024

Based on the above Table 5, the position of profitability with the help of technological innovation (Mobile banking, Internet banking & ATM) and users are mixed up and maintaining fluctuations too. The return on assets (ROA) ratio measures how effectively a company can earn a return on its investment in assets, indicating the efficiency of asset utilization in generating profit. On the other hand, the return on equity (ROE) ratio measures how well a company can generate profit from its shareholders' equity, reflecting the effectiveness of management in using equity investments to grow the company. In 2013/14 ROA is 2.3 and ROE is 27.6, in 2014/15 ROA is 1.9 and ROE is 24.8, in 2015/16 ROA is 2 and ROE is 26, in 2016/17 ROA is 2.1 and ROE is 19.1, in 2017/18 ROA is 1.50 and ROE is 12.82, in 2018/19 ROA is 1.79 and ROE is 13, in 2019/20 ROA is 1.19 and ROE is 8.92, in 2020/21 ROA is 1.56 and ROE is 11.04, in 2021/22 ROA is 1.55 and ROE is 11.17 and in 2022/23 ROA is 0.83 and ROE is 6.69. The data from 2013/14 to 2022/23 shows significant fluctuations in the company's profitability, as measured by ROA and ROE, which reflect the impact of technological innovations such as mobile banking, internet banking, and ATMs. Initially, the company demonstrated strong asset utilization efficiency and equity profitability, with ROA at 2.3 and ROE at 27.6 in 2013/14. Despite some gains and stabilization, both metrics exhibited sharp declines over time, with ROA falling to 0.83 and ROE to 6.69 by 2022/23. These fluctuations suggest that while technological

innovations initially boosted profitability, the company struggled to maintain consistent performance, ultimately facing significant challenges in efficiently utilizing assets and generating profit from shareholders' equity in the later years.

Based on the above results in Table 5, the position of technological innovation and the users are growing up. Starting from the year 2013/14 the number of ATMS were 77 and in the year 2022/23 the number of ATMS expands to 282. And similarly Mobile banking and Internet banking users in 2013/14 were 11000 and 78667 respectively and in 2022/23, these expand to 501951 and 679038 respectively which are also growing faster day by day. This result shows the Nepal Investment Mega Bank Limited's achievement in expanding technological innovation and its importance in attracting more customers in this computerized world.

Table 6:

Financial and Digital Banking Performance of SBL

Year	ROA	ROE	Mobile Banking	Internet Banking	ATMs
2013/14 (2070/71)	1.25	15.16	8766	4589	62
2014/15 (2071/72)	1.24	15.20	12899	7890	67
2015/16 (2072/73)	1.28	15.45	19899	12358	81
2016/17 (2073/74)	1.34	16.02	25889	18977	87
2017/18 (2074/75)	1.37	16.45	36777	23467	98
2018/19 (2075/76)	1.56	15.02	48767	33999	117
2019/20 (2076/77)	1.26	13.39	59878	57898	172
2020/21 (2077/78)	1.25	13.99	67889	68799	202
2021/22 (2078/79)	1.10	13.44	128999	72787	212
2022/23 (2079/80)	1.11	12.51	198777	88799	225

Source: Researcher's survey 2024

Based on the above Table 6, the position of profitability with the help of technological innovation (Mobile banking, Internet banking & ATM) and users are mixed up and maintaining fluctuations too. The return on assets (ROA) ratio measures how effectively a company can earn a return on its investment in assets, indicating the efficiency of asset utilization in generating profit. On the other hand, the return on equity (ROE) ratio measures how well a company can generate profit from its shareholders' equity, reflecting the effectiveness of management in using equity

investments to grow the company. In 2013/14 ROA is 1.25 and ROE is 15.16, in 2014/15 ROA is 1.24 and ROE is 15.20, in 2015/16 ROA is 1.28 and ROE is 15.45, in 2016/17 ROA is 1.34 and ROE is 16.02, in 2017/18 ROA is 1.37 and ROE is 16.45, in 2018/19 ROA is 1.56 and ROE is 15.02, in 2019/20 ROA is 1.26 and ROE is 13.39, in 2020/21 ROA is 1.25 and ROE is 13.99, in 2021/22 ROA is 1.10 and ROE is 13.44 and in 2022/23 ROA is 1.11 and ROE is 12.51. The data from 2013/14 to 2022/23 shows a generally stable yet slightly fluctuating trend in the company's profitability, as measured by ROA and ROE, reflecting the impact of technological innovations like mobile banking, internet banking, and ATMs. Initially, the company exhibited consistent efficiency in asset utilization and equity profitability, with ROA around 1.25 and ROE around 15.16 in 2013/14. Over the years, both metrics experienced minor variations, with ROA peaking at 1.56 in 2018/19 before declining to 1.11 by 2022/23, and ROE following a similar pattern, peaking at 16.45 in 2017/18 before decreasing to 12.51 by 2022/23. These trends suggest that while technological innovations contributed to maintaining profitability, the company faced challenges in sustaining higher levels of efficiency and profitability over the entire period.

Based on the above results in Table 6, the position of technological innovation and the users are growing up. Starting from the year 2013/14 the number of ATMS were 62 and in the year 2022/23 the number of ATMS expands to 225. And similarly Mobile banking and Internet banking users in 2013/14 were 8766 and 4589 respectively and in 2022/23, these expand to 198777 and 88799 respectively which are also growing faster day by day. This result shows the Siddhartha Bank Limited's achievement in expanding technological innovation and its importance in attracting more customers in this computerized world.

Table 7:*Financial and Digital Banking Performance of NIC*

Year	ROA	ROE	Mobile Banking	Internet Banking	ATMs
2013/14 (2070/71)	1.71	15.93	10579	2478	61
2014/15 (2071/72)	1.21	13.05	21386	5950	68
2015/16 (2072/73)	1.51	16.5	50994	13808	69
2016/17 (2073/74)	1.64	16.84	492814	43775	74
2017/18 (2074/75)	0.78	11.44	523989	58779	178
2018/19 (2075/76)	1.39	20.24	578089	122345	273
2019/20 (2076/77)	1.24	17.97	656787	256788	464
2020/21 (2077/78)	1.17	18.92	767876	345988	473
2021/22 (2078/79)	1.18	16.97	989882	578992	473
2022/23 (2079/80)	1.34	13.25	963885	349592	162

Source: Researcher's survey 2024

Based on the above Table 7, the position of profitability with the help of technological innovation (Mobile banking, Internet banking & ATM) and users are mixed up and maintaining fluctuations too. The return on assets (ROA) ratio measures how effectively a company can earn a return on its investment in assets, indicating the efficiency of asset utilization in generating profit. On the other hand, the return on equity (ROE) ratio measures how well a company can generate profit from its shareholders' equity, reflecting the effectiveness of management in using equity investments to grow the company. In 2013/14 ROA is 1.71 and ROE is 15.93, in 2014/15 ROA is 1.21 and ROE is 13.05, in 2015/16 ROA is 1.51 and ROE is 16.5, in 2016/17 ROA is 1.64 and ROE is 16.84, in 2017/18 ROA is 0.78 and ROE is 11.44, in 2018/19 ROA is 1.39 and ROE is 20.24, in 2019/20 ROA is 1.24 and ROE is 17.97, in 2020/21 ROA is 1.17 and ROE is 18.92, in 2021/22 ROA is 1.18 and ROE is 16.97 and in 2022/23 ROA is 1.22 and ROE is 15.12. The data from 2013/14 to 2022/23 highlights fluctuations in the company's profitability, as indicated by ROA and ROE, amidst the adoption of technological innovations like mobile banking, internet banking, and ATMs. The ROA starts at 1.71 in 2013/14, dips to 1.21 in 2014/15, peaks at 1.64 in 2016/17, and then varies slightly to end at 1.22 in 2022/23, showing mixed efficiency in asset utilization. Similarly, ROE starts at 15.93 in 2013/14, drops to 13.05 in 2014/15, peaks at 20.24 in 2018/19, and then fluctuates before settling at 15.12 in 2022/23,

reflecting varying effectiveness in generating profit from shareholders' equity. These trends suggest that while technological innovations initially bolstered profitability, the company faced challenges in maintaining consistent performance, resulting in fluctuations in both asset utilization and equity profitability.

Based on the above results in Table 7, the position of technological innovation and the users are growing up. Starting from the year 2013/14 the number of ATMS were 61 and in the year 2022/23 the number of ATMS expands to 517. And similarly Mobile banking and Internet banking users in 2013/14 were 10579 and 2478 respectively and in 2022/23, these expand to 1289354 and 878988 respectively which are also growing faster day by day. This result shows the NIC ASIA Bank Limited's achievement in expanding technological innovation and its importance in attracting more customers in this computerized world.

4.3 Correlation analysis

The study aimed to investigate the relationship between technological innovation—specifically mobile banking, internet banking, and ATMs—and financial performance, measured by Return on Assets (ROA) and Return on Equity (ROE). To achieve this, the researchers employed correlation and regression analysis. The Pearson correlation coefficient was used to determine the strength and direction of the relationship between these variables. By running a Pearson correlation, the study sought to quantify how closely the adoption and utilization of technological innovations were associated with changes in financial performance indicators. Table 7 presents the detailed correlation results, showing the extent to which each technological innovation is linked to ROA and ROE. This analysis helps in understanding whether innovations like mobile banking, internet banking, and ATMs significantly impact financial metrics, thereby offering insights into the effectiveness of these technologies in enhancing asset utilization efficiency and equity profitability. The results from the correlation analysis provide a foundational understanding that is further explored through regression analysis, which examines the predictive power of technological innovations on financial performance, allowing for a more nuanced interpretation of how these technologies contribute to the overall financial health and efficiency of the company.

Table 8:*Correlation Analysis*

		ROA	ROE	Mobile Banking	Internet Banking	ATM
ROA	Pearson Correlation	1	0.749**	-0.460**	-0.290	-0.446**
	Sig. (2-tailed)		0.000	0.003	0.056	0.001
ROE	Pearson Correlation		1	-0.248	-0.356*	-0.169
	Sig. (2-tailed)			0.122	0.018	0.239
Mobile Banking	Pearson Correlation			1	0.745**	0.847**
	Sig. (2-tailed)				0.000	0.000
Internet Banking	Pearson Correlation				1	0.722**
	Sig. (2-tailed)					0.000
ATM	Pearson Correlation					1
	Sig. (2-tailed)					

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Source: Researcher's survey 2024

According to the correlation analysis, the correlation coefficients range from -1 to 1, where a positive value signifies a positive relationship between the variables and a negative value indicates a negative relationship. The analysis indicates that ATMs have a negative correlation with ROA ($r = -0.446$), and this relationship is significant because the p-value ($p = 0.001$) is less than 0.05, implying a meaningful negative impact of ATMs on asset utilization efficiency. Mobile banking also shows a significant negative relationship with ROA ($r = -0.460$), supported by a p-value ($p = 0.003$) that is less than 0.05. Conversely, internet banking, while negatively related to ROA ($r = -0.290$), does not exhibit a significant relationship as the p-value ($p = 0.056$) is slightly above the 0.05 threshold.

The correlation analysis further reveals that ATMs are negatively correlated with ROE ($r = -0.169$); however, this relationship is insignificant since the p-value ($p = 0.239$) exceeds 0.05. Similarly, mobile banking is negatively correlated with ROE ($r = -0.248$), but this relationship is also insignificant given the p-value ($p = 0.122$) is greater than 0.05. In contrast, internet banking demonstrates a significant negative relationship with ROE ($r = -0.356$), as evidenced by a p-value ($p = 0.018$) which is less than 0.05. These

findings suggest that while ATMs and mobile banking negatively impact both ROA and ROE, their relationships with ROE are not statistically significant, unlike the significant negative relationship of internet banking with ROE.

4.4 Multiple regression analysis

In this study, SPSS version 29 was used to perform regression analysis, aiming to explain how Mobile Banking, Internet Banking and ATM impact bank profitability (ROA and ROE). The beta coefficients from the regression indicate the level of influence of each explanatory variable, while p-values reveal the significance of these influences. The R² values represent the model's explanatory effectiveness, and the adjusted R² values account for the impact of adding more variables on the model's explanatory power.

Model 1

It has been employed to examine the relationship between the independent variables and ROA.

$$ROA = \beta_0 + \beta_1 MB + \beta_2 IB + \beta_3 ATM + \dots + e$$

Table 9:

Model Summary

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate
1	0.469 ^a	0.220	0.155		0.34289

a. Predictors: (Constant), ATM, Internet Banking, Mobile Banking

Source: Researcher's survey 2024

Table 9 shows that the R-squared statistic is 22.0% and the adjusted R-squared statistic is 15.5%. This result reveals that the independent variables, including Mobile Banking and Internet Banking and ATM, only explain 15.5% of the changes in ROA. The remaining 84.5% of the variation in ROA is due to other factors not considered in the model, indicating that these variables are not particularly effective in explaining commercial banks' profitability in Nepal in terms of ROA.

Table 10:*ANOVA^a*

Model		Sum of Square	df	Mean Square	F	Sig.
1	Regression	1.192	3	0.397	3.380	0.029 ^b
	Residual	4.233	36	0.118		
	Total	5.425	39			

a. Dependent Variable: ROA

b. Predictors: (Constant), ATM, Internet Banking, Mobile Banking

Source: Researcher's survey 2024

Table 10 demonstrates that the independent variables do not have a significant impact on bank profits, as the p-value of 0.029 indicates that the relationship is statistically insignificant.

Table 11:*Coefficients^a*

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	Collinearity Statistics Tolerance	VIF
1	(Constant)	1.657	0.088		18.730	<0.001		
	Mobile Banking	-0.000	0.000	-0.415	-1.402	0.170	0.268	3.729
	Internet Banking	0.000	0.000	0.104	0.453	0.653	0.421	2.375
	ATM	0.000	0.001	-0.144	-0.503	0.618	0.332	3.008

a. Dependent Variable: ROA

Source: Researcher's survey 2024

In above Table 11, Multicollinearity analysis also performed in "Multivariate Data Analysis," state that multicollinearity exists when there are high inter-correlations among two or more independent variables in a regression model. This can make it challenging to assess the impact of each variable and often results in less reliable statistical inferences (Hair et al., 2018). Table represent the tolerance and Variance Inflation Factors (VIF) for Mobile Banking, which are 0.268 and 3.729, respectively. This indicates that 26.8% of its variance is not accounted for by other variables, and the

VIF of 3.729, being below 5, suggests minimal multicollinearity. Similarly, the tolerance values for Internet Banking and ATM are 0.421 and 0.332, respectively, with their VIFs also below 5. This further indicates low multicollinearity. Consequently, it was determined that the technological innovation factors do not exhibit multicollinearity and are appropriate for further research.

Based on the results presented in Table 11, none of the bank-specific independent variables show a statistically significant impact on ROA. This indicates that, among the variables considered in this study, no single factor significantly influences the profitability of Nepalese commercial banks with regard to ROA. The regression analysis reveals that the coefficients for Mobile banking ($p=0.170$), Internet banking ($p=0.653$), and ATM ($p=0.618$) are not statistically significant in predicting bank profits, as all p-values exceed the 0.05 threshold. In regression analysis, a lower p-value signifies a higher significance of the variable, while a higher p-value indicates a lack of significance. Consequently, these variables collectively do not exhibit a strong effect on ROA for commercial banks. The regression equation obtained is:

$$\text{ROA} = 1.657 + (-0.0000004868) \text{MB} + (0.0000001985) \text{IB} + (0.000) \text{ATM}$$

The researcher lacks control over the data collection process in this study, which may introduce biases and inconsistencies, potentially leading to unintended results.

Model 2

It has been employed to examine the relationship between the independent variables and ROE.

$$\text{ROE} = \beta_0 + \beta_1 \text{MB} + \beta_2 \text{IB} + \beta_3 \text{ATM} + \dots + e$$

Table 12:

Model Summary

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate
1	0.465 ^a	0.216	0.150		4.29811

a. Predictors: (Constant), ATM, Internet Banking, Mobile Banking

Source: Researcher's survey 2024

Table 12 shows that the R-squared statistic is 21.6% and the adjusted R-squared statistic is 15.0%. This result reveals that the independent variables, including Mobile Banking and Internet Banking and ATM, only explain 15.0% of the changes in ROE. The remaining 85.0% of the variation in ROE is due to other factors not considered in the model, indicating that these variables are not particularly effective in explaining commercial banks' profitability in Nepal in terms of ROE.

Table 13:

ANOVA^a

Model		Sum of Square	df	Mean Square	F	Sig.
1	Regression	183.028	3	61.009	3.302	0.031 ^b
	Residual	665.054	36	18.474		
	Total	848.082	39			

a. Dependent Variable: ROE

b. Predictors: (Constant), ATM, Internet Banking, Mobile Banking

Source: Researcher's survey 2024

Table 13 demonstrates that the independent variables do not have a significant impact on bank profits, as the p-value of 0.031 indicates that the relationship is statistically insignificant.

Table 14:

Coefficients^a

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	Collinearity Statistics Tolerance	VIF
1	(Constant)	16.883	1.109		15.224	<0.001		
	Mobile Banking	-0.000	0.000	-0.311	-1.047	0.302	0.268	3.729
	Internet Banking	-0.000	0.000	-0.531	-2.315	0.026	0.421	2.375
	ATM	0.021	0.011	0.541	1.880	0.068	0.332	3.008

a. Dependent Variable: ROE

Source: Researcher's survey 2024

Table 14, also represent the tolerance and Variance Inflation Factors (VIF) for Mobile Banking, which are 0.268 and 3.729, respectively. This indicates that 26.8% of its variance is not accounted for by other variables, and the VIF of 3.729, being below 5, suggests minimal multicollinearity. Similarly, the tolerance values for Internet Banking and ATM are 0.421 and 0.332, respectively, with their VIFs also below 5. This further indicates low multicollinearity. Consequently, it was determined that the technological innovation factors do not exhibit multicollinearity and are appropriate for further research.

Based on the results presented in Table 14, none of the bank-specific independent variables show a statistically significant impact on ROE. This indicates that, among the variables considered in this study, no single factor significantly influences the profitability of Nepalese commercial banks with regard to ROE. The regression analysis reveals that the coefficients for Mobile banking ($p=0.302$), Internet banking ($p=0.226$), and ATM ($p=0.068$) are not statistically significant in predicting bank profits, as all p-values exceed the 0.05 threshold. In regression analysis, a lower p-value signifies a higher significance of the variable, while a higher p-value indicates a lack of significance. Consequently, these variables collectively do not exhibit a strong effect on ROE for commercial banks. The regression equation obtained is:

$$\text{ROE} = 16.883 + (-0.000004561) \text{MB} + (0.00001270) \text{IB} + (0.021) \text{ATM}$$

This result demonstrates that while internet banking has a minor impact on the financial performance of commercial banks in terms of ROE, both Mobile banking and ATM are found to have a negative effect on bank profitability. The researcher lacks control over the data collection process in this study, which may introduce biases and inconsistencies, potentially leading to unintended results.

4.5 Discussion

The findings of this study provide important insights into the impact of technological innovations on the financial performance of Nepalese commercial banks, specifically in terms of Return on Assets (ROA) and Return on Equity (ROE).

The correlation analysis reveals that ATMs have a significant negative correlation with ROA ($r = -0.446$, $p = 0.001$), suggesting that increased ATM usage may reduce asset utilization efficiency. This finding aligns with previous research that points to the high

maintenance and operational costs associated with ATMs, which can detract from overall profitability (Kumar et al., 2017). Despite this significant negative correlation with ROA, the relationship between ATMs and ROE ($r = -0.169$, $p = 0.239$) is found to be statistically insignificant. This inconsistency implies that while ATMs may influence asset utilization, their impact on equity returns is not substantial. The high costs involved in ATM deployment and maintenance likely offset any potential benefits from increased customer convenience and transaction volumes (Sharma, 2019).

Mobile banking also shows a significant negative correlation with ROA ($r = -0.460$, $p = 0.003$), indicating a potential reduction in asset utilization efficiency with greater mobile banking adoption. This finding is supported by studies such as those by Khan et al. (2020), which suggest that while mobile banking can improve customer reach and satisfaction, the initial costs and ongoing security investments can negatively impact profitability. However, the relationship between mobile banking and ROE ($r = -0.248$, $p = 0.122$) is not significant, suggesting that the costs associated with mobile banking do not have a pronounced effect on equity returns. This might be because the benefits of mobile banking, such as increased customer engagement and transaction frequency, are not immediately reflected in profitability metrics like ROE.

Internet banking presents a negative correlation with ROA ($r = -0.290$), though this relationship is not statistically significant ($p = 0.056$). This indicates that while internet banking might reduce asset utilization efficiency, the effect is not strong enough to be conclusive. On the other hand, the significant negative correlation between internet banking and ROE ($r = -0.356$, $p = 0.018$) suggests that increased internet banking usage can adversely affect equity returns. This result is consistent with findings from Gupta and Verma (2016), who highlight that the infrastructure and cybersecurity investments required for internet banking can be substantial, thereby impacting profitability.

The regression analysis further supports these findings. The R-squared values indicate that the independent variables (ATM, mobile banking, and internet banking) explain only a small portion of the variability in ROA (15.5%) and ROE (15.0%). This low explanatory power suggests that other factors not included in the model play a more significant role in determining the financial performance of Nepalese commercial banks. Additionally, the regression coefficients for all three independent variables (mobile banking, internet banking, and ATM) are not statistically significant in

predicting ROA or ROE, with p-values exceeding the 0.05 threshold. This highlights that these technological innovations, despite their potential benefits, do not significantly drive profitability in the context of Nepalese commercial banks.

These results underscore the complexity of the relationship between technological innovation and financial performance. While technology can enhance customer convenience and operational efficiency, the associated costs and challenges can offset these benefits, particularly in the short term. Therefore, banks must carefully consider the cost-benefit trade-offs when investing in new technologies. Furthermore, the significant portion of variability in financial performance explained by other factors suggests that banks should also focus on other strategic areas, such as improving operational efficiency, enhancing customer service, and developing innovative financial products, to achieve sustainable profitability.

CHAPTER V

SUMMARY AND CONCLUSION

The entire study is summed up in this chapter. The summary, conclusions, and implications sections make up the three sections of this chapter. The summary is covered in the first part. The next part summarizes the main conclusions, while the third discusses the ramifications of technological innovation in banking.

5.1 Summary

This thesis investigates the relationship between technological innovation and financial performance in Nepalese banking, focusing on major banks such as Everest Bank, Himalayan Bank, Nepal Investment Mega Bank, Siddhartha Bank, and NIC Asia Bank. The primary objectives are to examine the relationship between technology innovation and financial performance, identify the effect of technology innovation on financial performance.

The study employs both descriptive and analytical approaches. The descriptive approach is used for the conceptualization of the problem, while the analytical approach utilizes financial and statistical tools to determine the outcomes. Secondary data from the annual reports and official websites of the sample banks from 2013/14 to 2022/23 is used. This data, processed and analyzed using SPSS, provides insights into the relationship between technological innovations such as mobile banking, internet banking, and ATMs, and financial performance metrics like Return on Assets (ROA) and Return on Equity (ROE).

The data analysis reveals mixed results regarding the impact of technological innovations on financial performance. Initially, technological advancements such as the increase in ATMs and users of mobile and internet banking show a positive trend in attracting more customers. However, the correlation and regression analyses indicate that these innovations have not significantly improved financial performance. For instance, the correlation analysis shows a negative relationship between ATMs and ROA ($r = -0.446$) and between mobile banking and ROA ($r = -0.460$), both of which are significant. Conversely, internet banking, while negatively related to ROA, does not show a significant relationship. Similarly, the impact of these technologies on ROE is also not statistically significant.

The regression analysis further supports these findings, with R-squared values of 22.0% for ROA and 21.6% for ROE, indicating that only a small portion of the variations in financial performance can be explained by technological innovations. The remaining variation is due to other factors not considered in the model. This suggests that while technological innovations initially boosted customer attraction and operational efficiency, they did not significantly sustain profitability improvements over the studied period.

In conclusion, the study demonstrates that although technological innovations in mobile banking, internet banking, and ATMs have grown significantly in Nepalese banks, their impact on financial performance, measured by ROA and ROE, remains limited. This highlights the need for banks to consider additional factors and strategies to enhance their financial performance effectively.

5.2 Conclusion

The findings of this study provide crucial insights into the impact of technological innovations on the financial performance of Nepalese commercial banks, specifically focusing on Return on Assets (ROA) and Return on Equity (ROE). The correlation analysis reveals that ATMs have a significant negative correlation with ROA, suggesting that increased ATM usage may reduce asset utilization efficiency. This finding aligns with previous research indicating that the high maintenance and operational costs associated with ATMs can detract from overall profitability. Despite this significant negative correlation with ROA, the relationship between ATMs and ROE is statistically insignificant, implying that while ATMs may influence asset utilization, their impact on equity returns is not substantial. This inconsistency highlights that the high costs involved in ATM deployment and maintenance likely offset any potential benefits from increased customer convenience and transaction volumes.

Similarly, mobile banking shows a significant negative correlation with ROA, indicating a potential reduction in asset utilization efficiency with greater mobile banking adoption. This finding is supported by studies suggesting that while mobile banking can improve customer reach and satisfaction, the initial costs and ongoing security investments can negatively impact profitability. However, the relationship between mobile banking and ROE is not significant, suggesting that the costs associated

with mobile banking do not have a pronounced effect on equity returns. This might be because the benefits of mobile banking, such as increased customer engagement and transaction frequency, are not immediately reflected in profitability metrics like ROE.

Internet banking presents a negative correlation with ROA, though this relationship is not statistically significant, indicating that while internet banking might reduce asset utilization efficiency, the effect is not strong enough to be conclusive. On the other hand, the significant negative correlation between internet banking and ROE suggests that increased internet banking usage can adversely affect equity returns. This result is consistent with findings that highlight the substantial infrastructure and cybersecurity investments required for internet banking, thereby impacting profitability.

The regression analysis further supports these findings, indicating that the independent variables (ATM, mobile banking, and internet banking) explain only a small portion of the variability in ROA and ROE. This low explanatory power suggests that other factors not included in the model play a more significant role in determining the financial performance of Nepalese commercial banks. Additionally, the regression coefficients for all three independent variables are not statistically significant in predicting ROA or ROE. This highlights that these technological innovations, despite their potential benefits, do not significantly drive profitability in the context of Nepalese commercial banks.

In conclusion, these results underscore the complexity of the relationship between technological innovation and financial performance. While technology can enhance customer convenience and operational efficiency, the associated costs and challenges can offset these benefits, particularly in the short term. Therefore, banks must carefully consider the cost-benefit trade-offs when investing in new technologies. Furthermore, the significant portion of variability in financial performance explained by other factors suggests that banks should also focus on other strategic areas, such as improving operational efficiency, enhancing customer service, and developing innovative financial products, to achieve sustainable profitability.

5.3 Implications

The findings of this study offer several important implications for policymakers, banking institutions, and future researchers concerning the role of technological innovation in the financial performance of Nepalese commercial banks.

Policymakers, particularly those within the Nepal Rastra Bank (NRB), should take note of the significant yet complex effects of technological innovations on bank performance. Given that ATMs, mobile banking, and internet banking have mixed impacts on ROA and ROE, regulatory frameworks need to be designed to support technological advancements while mitigating the associated costs. Policies that incentivize innovation and provide financial assistance for technological upgrades could help banks manage the costs better, ensuring that the benefits of improved customer convenience and operational efficiency are realized without compromising profitability.

For banking institutions, the study highlights the need for a balanced approach when investing in technological innovations. While technologies such as ATMs, mobile banking, and internet banking can enhance customer reach and service delivery, banks must be mindful of the high initial and ongoing costs. Strategic investments in technology should be accompanied by measures to enhance operational efficiency and cost management. Banks could focus on optimizing the use of these technologies to improve profitability over time, rather than expecting immediate returns. Additionally, they should consider diversifying their strategies by investing in customer service improvements and innovative financial products to drive profitability.

Future researchers can build on this study by exploring other factors that might influence the financial performance of banks. Given that technological innovations only explain a small portion of the variability in ROA and ROE, there is a need to investigate additional variables such as organizational culture, management practices, market competition, and macroeconomic conditions. Moreover, longitudinal studies could provide deeper insights into the long-term impacts of technological innovations on financial performance. Researchers could also explore the differential impacts of various types of technologies and their interactions with other strategic initiatives within banks.

Bank managers and financial practitioners should leverage these findings to make informed decisions regarding technology investments. Understanding that technological innovations alone are not a panacea for profitability challenges, they should adopt a holistic approach that includes enhancing operational efficiencies, improving risk management practices, and fostering a culture of innovation. Continuous monitoring and evaluation of technology investments and their outcomes are crucial to ensure that these innovations contribute positively to financial performance.

Customers can benefit indirectly from the study's implications, as banks that adopt a more strategic and balanced approach to technological innovation are likely to offer better and more reliable services. As banks become more efficient and customer-centric through optimized technology use, customers can expect improved banking experiences, greater convenience, and enhanced security in their transactions.

In summary, this study underscores the importance of a nuanced approach to technological innovation in the banking sector. By carefully managing the costs and benefits of technology investments and considering a wide range of factors influencing financial performance, banks in Nepal can enhance their profitability and ensure sustainable growth.

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APPENDIX I

SN		Year	Name of Selected Banks	ROA	ROE	Mobile Banking	Internet Banking	ATM
1	20 th	2013/14 (2070/71)	EBL	2.25	24.75	85641	88231	74
2	21 st	2014/15 (2071/72)	EBL	1.85	20.57	119898	95320	80
3	22 nd	2015/16 (2072/73)	EBL	1.61	18.31	167857	105431	87
4	23 rd	20216/17 (2073/74)	EBL	1.72	17.71	189356	115430	90
5	24 th	2017/18 (2074/75)	EBL	1.78	16.00	223899	130210	113
6	25 th	2018/19 (2075/76)	EBL	1.80	17.33	280433	166567	122
7	26 th	2019/20 (2076/77)	EBL	1.36	13.50	360599	200485	124
8	27 th	2020/21 (2077/78)	EBL	0.84	8.56	444839	241310	138
9	28 th	2021/22 (2078/79)	EBL	1.08	10.77	502775	290448	156
10	29 th	2022/23 (2079/80)	EBL	1.34	13.25	963885	349592	162
1	22 nd	2013/14 (2070/71)	HBL	1.3	15.76	9088	83567	78
2	23 rd	2014/15 (2071/72)	HBL	1.34	18.82	18776	97879	80
3	24 th	2015/16 (2072/73)	HBL	1.94	21.94	34445	126775	84
4	25 th	20216/17 (2073/74)	HBL	2.03	18.61	65728	156798	93
5	26 th	2017/18 (2074/75)	HBL	1.61	13.27	89323	166778	105
6	27 th	2018/19 (2075/76)	HBL	2.04	17.28	138453	178665	122
7	28 th	2019/20 (2076/77)	HBL	1.84	14.71	178604	190718	138
8	29 th	2020/21 (2077/78)	HBL	1.86	14.89	230399	203584	144
9	30 th	2021/22 (2078/79)	HBL	1.09	10.76	297215	217318	156
10	31 st	2022/23 (2079/80)	HBL	0.47	4.65	383408	231979	264
1	27 th	2013/14 (2070/71)	NIMB	2.3	27.6	11000	78667	77
2	28 th	2014/15 (2071/72)	NIMB	1.9	24.8	19000	97668	82

3	29 th	2015/16 (2072/73)	NIMB	2	26	30000	134566	82
4	30 th	20216/17 (2073/74)	NIMB	2.1	19.1	43000	156778	98
5	31 st	2017/18 (2074/75)	NIMB	1.50	12.82	64764	176236	104
6	32 nd	2018/19 (2075/76)	NIMB	1.79	13.00	97544	230810	117
7	33 rd	2019/20 (2076/77)	NIMB	1.19	8.92	146915	302284	125
8	34 th	2020/21 (2077/78)	NIMB	1.56	11.04	221274	395890	130
9	35 th	2021/22 (2078/79)	NIMB	1.55	11.17	333270	518483	132
10	36 th	2022/23 (2079/80)	NIMB	0.83	6.69	501951	679038	282
1		2013/14 (2070/71)	SBL	1.25	15.16	8766	4589	62
2		2014/15 (2071/72)	SBL	1.24	15.20	12899	7890	67
3		2015/16 (2072/73)	SBL	1.28	15.45	19899	12358	81
4		20216/17 (2073/74)	SBL	1.34	16.02	25889	18977	87
5		2017/18 (2074/75)	SBL	1.37	16.45	36777	23467	98
6		2018/19 (2075/76)	SBL	1.56	15.02	48767	33999	117
7		2019/20 (2076/77)	SBL	1.26	13.39	59878	57898	172
8		2020/21 (2077/78)	SBL	1.25	13.99	67889	68799	202
9		2021/22 (2078/79)	SBL	1.10	13.44	128999	72787	212
10		2022/23 (2079/80)	SBL	1.11	12.51	198777	88799	225
1	17 th	2013/14 (2070/71)	NIC-Asia	1.71	15.93	10579	2478	61
2	18 th	2014/15 (2071/72)	NIC-Asia	1.21	13.05	21386	5950	68
3	19 th	2015/16 (2072/73)	NIC-Asia	1.51	16.5	50994	13808	69
4	20 th	20216/17 (2073/74)	NIC-Asia	1.64	16.84	492814	43775	74
5	21 st	2017/18 (2074/75)	NIC-Asia	0.78	11.44	523989	58779	178
6	22 nd	2018/19 (2075/76)	NIC-Asia	1.39	20.24	578089	122345	273
7	23 rd	2019/20 (2076/77)	NIC-Asia	1.24	17.97	656787	256788	464

8	24th	2020/21 (2077/78)	NIC-Asia	1.17	18.92	767876	345988	473
9	25th	2021/22 (2078/79)	NIC-Asia	1.18	16.97	989882	578992	473
10	26th	2022/23 (2079/80)	NIC-Asia	1.22	15.12	1289354	878988	517

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ABSTRACT This thesis explores the relationship between technological innovation and financial performance in Nepalese commercial banks, focusing on major institutions such as Everest Bank, Himalayan Bank, Nepal Investment Mega Bank, Siddhartha Bank, and NIC Asia Bank. The study aims to assess the impact of technologies like mobile banking, internet banking, and ATMs on financial performance indicators, particularly Return on Assets (ROA) and Return on Equity (ROE), over the period from 2013/14 to 2022/23. Utilizing both descriptive and analytical approaches, the research analyzes secondary data sourced from annual reports and official bank websites. The findings reveal mixed results, with technological advancements initially enhancing customer engagement but showing a limited and, at times, negative impact on financial performance. Correlation and regression analyses indicate significant negative relationships between ATMs, mobile banking, and ROA, while the impact on ROE remains statistically insignificant. The regression model's low explanatory power further suggests that factors beyond technological innovation play a crucial role in determining bank profitability. The study concludes that while technological innovations have grown significantly in Nepalese banks, their effect on financial performance remains modest, highlighting the need for a balanced approach to technology investments. The implications for policymakers, banking institutions, and future researchers emphasize the importance of strategic planning and the exploration of additional factors influencing financial outcomes in the banking sector. Key Words: ROA, ROE, Technological Innovation, Mobile Banking, Internet Banking, ATM

CHAPTER I INTRODUCTION 1.1 Background of the study The banking industry is regarded as the