The Impact of Artificial Intelligence in the Banking Sector in Nepal

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Abstract

This study explores the effects of Artificial Intelligence (AI) on Nepal's banking sector, focusing on its relationship with employee satisfaction, customer behavior, customer service, job obsolescence, and bank profitability. Utilizing a quantitative research design, data were gathered from 195 employees at four leading commercial banks in Nepal through convenience sampling, selected for its practicality and accessibility. The results demonstrate a significant positive correlation between AI implementation and employee satisfaction, customer behavior, and bank profitability. Conversely, the association between AI and customer service was found to be weaker, and no significant link was observed with job obsolescence. These findings offer strategic guidance for banks aiming to harness AI technologies effectively while addressing potential challenges, thereby contributing valuable insights for the sector's ongoing digital transformation.

Keywords: *AI, Banking, Satisfaction, Behavior, Obsolescence, Profitability*

Introduction

The banking sector in Nepal, as in many other economies, plays a crucial role in promoting economic growth and ensuring financial stability. Banks offer vital financial services such as credit provision, deposit management, and payment systems that support economic transactions and investments (Koerselman, 2023). With ongoing technological advancements, the integration of Artificial Intelligence (AI) has emerged as a transformative development in the banking industry (Biswas, Carson, Chung, Shwaitang & Thomas, 2020).

Although AI has the potential to significantly improve operational efficiency, enhance customer experience, and reduce operational costs, its implementation in Nepal remains at a nascent stage (Boustani, 2021; Harman, 2019; Rahman, 2023).

Despite AI's growing influence in the global banking landscape, there is a noticeable lack of comprehensive studies focusing on its impact within the Nepalese context (Rahman, 2023). While some research has highlighted AI's potential to boost profitability and competitiveness in banks (Kaya, 2019; Schroer, 2021), there is limited understanding of its implications for employee satisfaction, customer behavior, and job displacement in Nepal (Rahman, 2023). Moreover, the ethical considerations and regulatory challenges associated with adopting AI in Nepal's heavily regulated banking environment have not been adequately explored (Umamaheswari et al., 2023; Kaya, 2019).

This study seeks to bridge these gaps by examining the multifaceted impact of AI implementation on the Nepalese banking sector. Specifically, it will assess how AI influences employee satisfaction, customer behavior, customer service quality, job displacement, and bank profitability. Through this analysis, the research aims to contribute to the expanding literature on AI in banking and offer practical insights for policymakers, banking professionals, and technology developers in Nepal. These findings are expected to inform strategic approaches that harness AI to enhance the efficiency, innovation, and competitiveness of Nepal's banking sector, while addressing its unique challenges and opportunities.

Literature Review

The integration of Artificial Intelligence (AI) into the banking sector has garnered significant interest from both academics and practitioners due to its transformative potential. Globally, AI is reshaping the banking landscape by enhancing operational efficiency, customer service, risk management, and data analytics. In the context of banking, AI refers to the use of technologies that simulate human intelligence to perform tasks such as decision-making, problem-solving, and learning (Theuri & Olukuru, 2022). According to Kaur et al. (2020), AI has been rapidly integrated into banking functions, improving core operations and enabling better service delivery. Kumar (2021) categorized AI applications into three operational areas: front office (e.g., conversational banking), middle office (e.g., fraud detection and risk analysis), and back office (e.g., credit underwriting). Koerselman (2023) further emphasized this growth, noting that AI adoption among companies rose from 20% in 2017 to 50% in 2022, with over 60% of financial services firms now incorporating AI technologies.

Several studies have explored the practical applications of AI in banking. In customer service, AI-powered chatbots and voice assistants provide around-the-clock support,

improving customer experience and easing the burden on traditional channels (Winkens, 2021; Dumesia, 2021). In terms of security, AI and machine learning techniques enhance fraud detection and prevention mechanisms (Costa, 2021; Scott, 2021). AI also plays a vital role in risk management, including automating Know Your Customer (KYC) procedures and identifying cyber threats (Kimachia, 2021). For credit and loan decisions, AI systems assess transactional data and customer behavior to enable more accurate and profitable decision-making (Harman, 2019; Winkens, 2021). Additionally, AI has transformed investment and trading practices, with algorithmic trading now accounting for over 70% of global trading activities (Kumar, 2021; Turner, 2023).

Beyond operational efficiencies, AI implementation in banking also influences employee satisfaction, customer behavior, customer service quality, job displacement, and profitability. Studies suggest that by automating repetitive tasks, AI increases employee satisfaction and allows staff to focus on more strategic roles, though fears of job obsolescence persist (He & V, 2018; Kimachia, 2021). On the customer side, AI-driven personalized services like smart chatbots enhance engagement, build loyalty, and better meet individual needs (Costa, 2021; Winkens, 2021). AI tools also elevate customer service delivery by offering instant, accurate, and increasingly personalized responses (Dumesia, 2021). While job automation poses a threat to certain roles, it simultaneously opens up opportunities in AI development and management (Boustani, 2021). In terms of profitability, AI boosts operational efficiency and reduces costs particularly in areas like fraud detection and customer service thereby improving financial performance (Seyongwe, 2022; Rahman, 2023).

In Nepal, research specifically examining AI in the banking sector remains limited. However, emerging studies offer promising insights. Rahman (2023) estimates that AI could help Nepalese banks reduce operational expenses by up to 35% and achieve a net gain of around 5%. The AI market within Nepal's financial services sector is projected to grow at a compound annual growth rate (CAGR) exceeding 30% from 2020 to 2025, suggesting strong future potential (Rahman, 2023).

Despite these advantages, several challenges hinder the effective implementation of AI in banking. Data privacy and customer confidentiality remain significant concerns (Dhruw & Chawda, 2020). Regulatory compliance with constantly evolving financial laws also presents obstacles (Costa, 2021). In addition, many banks especially in developing economies like Nepal face technological and infrastructural limitations, such as outdated systems and poor-quality data, which impede AI adoption (Biswas et al., 2020).

Looking ahead, the future of AI in banking appears bright, with strong potential for job transformation and service personalization. For example, AI is projected to affect 23% of jobs in China's financial sector by 2027, a trend that could be mirrored in countries like Nepal (He & V, 2018). More advanced AI systems are also expected to deliver increasingly personalized financial services, including tailored investment advice (Son, 2023). Nevertheless, realizing these opportunities will require addressing technical, regulatory, and organizational challenges. In conclusion, while the literature supports the transformative impact of AI in banking, further empirical research is essential to understand its unique implications for Nepal's banking industry and to guide its strategic implementation.

Research Methodology

This study investigates the impact of Artificial Intelligence (AI) on the banking sector in Nepal, with a specific focus on employee satisfaction, customer behavior, customer service, job displacement, and bank profitability. To explore these aspects, a quantitative research approach was adopted, emphasizing practical implications over theoretical exploration. A cross-sectional research design was employed, targeting employees of commercial banks within the Kathmandu Valley. The primary data collection method involved a structured, self-administered questionnaire, which was developed to gather responses from employees regarding the influence of AI in their respective institutions. The survey tool was carefully designed and pre-tested to ensure both reliability and validity. It was structured to clearly reflect the study's objectives and offer insight into real-world applications of AI in banking.

The study population comprised employees from Nepal's commercial banking sector. Four banks Nepal Bank Limited, Nepal SBI Bank, Nabil Bank Limited, and Machhapuchchhre Bank Limited were purposely selected for their active AI adoption and their representation of both traditional and modern banking practices in Nepal. A non-probability convenience sampling technique was used to select participants, focusing on employees with awareness or experience in AI-related processes. A total of 195 responses were received, providing a substantial dataset for analysis. Primary data were collected through an online survey distributed via Google Forms, using the English language. The questionnaire contained 15 items across eight sections, utilizing a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The survey covered key areas such as demographic details,

AI adoption and implementation, employee satisfaction, customer behavior, customer service, job obsolescence, bank profitability, and general feedback. In addition to primary data, secondary data from academic articles, reports, and online sources were used to support the literature review and provide broader context.

The collected data were analyzed using descriptive and inferential statistical techniques. Measures of central tendency and variability specifically, mean and standard deviation were used to summarize the main variables. Pearson's correlation coefficient was applied to examine relationships between AI implementation and the five target variables. Furthermore, ordinal regression analysis was used for ordinal-level outcomes such as employee satisfaction, customer behavior, and customer service, while multiple linear regression was applied to continuous variables like job obsolescence and bank profitability. Data processing and analysis were conducted using SPSS and Microsoft Excel. To ensure reliability, Cronbach's alpha was calculated for each scale. Items with an alpha coefficient below 0.5 were excluded from the final analysis to maintain consistency. To establish validity, the questionnaire was pre-tested with a small sample of banking employees, which helped to refine ambiguous or unclear items and enhance overall questionnaire quality.
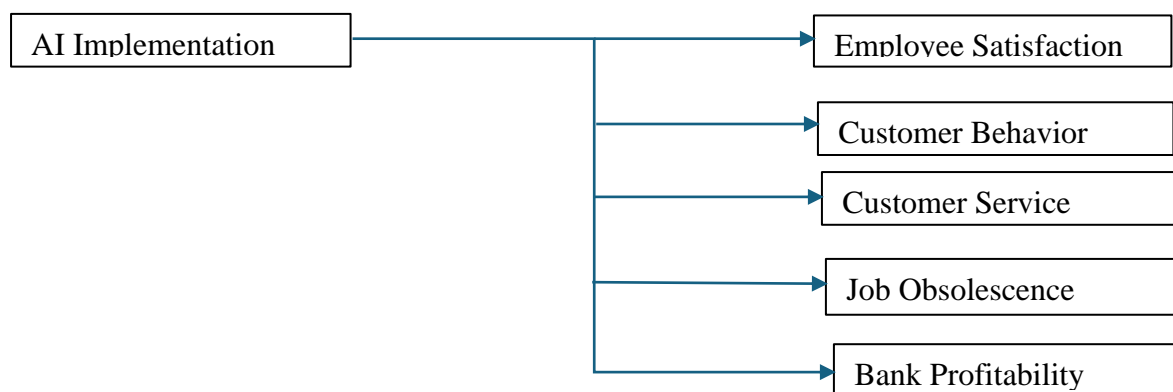
Research Framework

The study investigates the connection between the implementation of Artificial Intelligence (AI) and its effects on employee satisfaction, customer behavior, customer service, job obsolescence, and bank profitability.

Figure 1

Research Framework

Independent Variable   **Dependent Variables**

Source: (Rahman, 2023; Boustani, 2021; Geetha, 2021; Sambre, Joshi & Thapliyal, 2020;

Kaur, Sahdev, Sharma & Siddiqui, 2020)

Data Analysis

This section presents an analysis of the impact of Artificial Intelligence (AI) implementation on employee satisfaction, customer behavior, customer service, job obsolescence, and bank profitability within Nepal's banking sector, utilizing SPSS for data analysis.

Demographic insights from the sample reveal that the majority of respondents were either IT/Technology Specialists (27.2%) or Teller/Customer Service Representatives (24.1%). Regarding work experience, 43.1% of participants had been employed in the banking sector for more than seven years, while 35.4% had between four to six years of experience. In terms of AI usage, 53.8% of respondents reported that they do not use AI tools in their daily work routines, whereas 46.2% indicated current usage of AI technologies in their roles.

Reliability Analysis

Cronbach's Alpha Test

Table 1

Reliability Analysis of Measurement Scales

Measurement Scales	Cronbach's Alpha (α)	No. of items (N)
AI Implementation	0.568	2
Employee Satisfaction	0.193	8
Customer Behavior	0.677	2
Customer Service	0.368	2
Job Obsolescence	0.133	2
Bank Profitability	0.544	2

Cronbach's Alpha tests were carried out to evaluate the internal consistency of the measurement scales used in the study. Although a few scales exhibited lower reliability scores, the overall questionnaire demonstrated strong alignment with previous research findings and performed effectively during the pilot study, thereby supporting its overall validity.

Descriptive Analysis

Mean scores (on a 5-point scale) and standard deviations for key constructs:

Table 2

Descriptive Analysis for key constructs

Key constructs	Mean (M)	Standard Deviation (SD)

AI Implementation	0.6105	0.4643
Employee Satisfaction	0.627	0.4395
Customer Behavior	1.813	1.0192
Customer Service	2.569	0.72445
Job Obsolescence	1.8385	0.7404
Bank Profitability	2.087	0.9941
Overall	1.5908	0.7302

The descriptive analysis revealed varying levels of agreement across different aspects of AI implementation. Overall, respondents showed moderate levels of agreement regarding the impact of AI across various banking operations.

Correlation Analysis

Table 3

Pearson Correlation Matrix

	AI Implementation		Customer Behavior	Customer Service	Job Obsolescence	Bank Profitability
AI Implementation	1					
	0.400**	1				
Customer Behavior	0.410**	0.363**	1			
Customer Service	0.252**	0.473**	0.341**	1		
Job Obsolescence	0.118	0.182*	0.334*	0.113	1	
Bank Profitability	0.238**	0.287**	0.570**	0.208**	0.378**	1

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

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

The Pearson correlation analysis identified meaningful associations between AI implementation and the other examined variables.

- Employee Satisfaction: $r = 0.400$, $p < 0.01$

- Customer Behavior: r = 0.410, p < 0.01
- Customer Service: r = 0.252, p < 0.01
- Job Obsolescence: r = 0.118, p > 0.05 (not significant)
- Bank Profitability: r = 0.238, p < 0.01

The findings suggest a positive correlation between AI implementation and the majority of the dependent variables, except for job obsolescence, which did not show a significant relationship.

Regression Analysis

Ordinal regression analysis was conducted to examine the relationship between AI Implementation and the dependent variables:

Table 4

Regression Analysis

Dependent Variables	Model fit	Parameter Estimate
Employee Satisfaction	Not significant (p > 0.05)	1.932, p < 0.001
Customer Behavior	Significant (p < 0.05)	2.178, p < 0.001
Customer Service	Significant (p < 0.05)	1.143, p = 0.001
Job Obsolescence	Marginally Significant	0.495, p = 0.105 (not significant)
Bank Profitability	Not Significant (p > 0.05)	1.059, p = 0.001

In summary, the analysis suggests that AI implementation has positive impacts on employee satisfaction, customer behavior, and bank profitability, while showing no significant effect on job obsolescence. The relationship with customer service is positive but requires further investigation due to mixed model fit results.

Discussion

This section presents the findings from the analysis of data collected to assess the impact of Artificial Intelligence (AI) in Nepal's banking sector. The results are organized into four key areas: demographic overview, descriptive statistics, correlation analysis, and regression analysis.

The demographic overview highlights that the survey included 195 respondents from four major commercial banks in Nepal, representing various job roles. The largest groups were IT/Technology Specialists, accounting for 27.2% of respondents, followed by Teller/Customer Service Representatives at 24.1%. Regarding experience, 43.1% of participants had over seven years in the banking sector, while 35.4% had between four to six years. This sample

composition offers a strong foundation of knowledgeable employees familiar with AI-related banking processes.

Descriptive analysis using a five-point Likert scale provided insights into respondents' perceptions of AI implementation and its effects. More than half (53.3%) agreed that AI improved job efficiency, and 46.7% noted a reduction in their workload due to AI. Regarding customer behavior, 41.5% observed significant changes attributed to AI, while 72.3% believed AI could potentially replace human roles in customer service. Additionally, 38.1% rated AI's influence on bank profitability as moderate, with 61% agreeing that AI positively contributes to profitability.

The correlation analysis revealed several significant relationships between AI implementation and key variables. There was a moderate positive correlation between AI implementation and employee satisfaction ($r = 0.400$, $p < 0.01$), indicating that AI enhances employee experience. Similarly, AI had a significant positive correlation with customer behavior ($r = 0.410$, $p < 0.01$), showing its considerable effect on how customers interact with banking services. The correlation between AI and customer service was also positive and significant ($r = 0.252$, $p < 0.05$), although weaker compared to employee satisfaction and customer behavior. In contrast, the relationship between AI and job obsolescence was positive but not statistically significant ($r = 0.118$, $p > 0.05$), suggesting that AI has limited impact on perceived job loss. Finally, AI implementation was positively correlated with bank profitability ($r = 0.238$, $p < 0.01$), highlighting AI's potential to improve financial outcomes.

Regression analysis further supported these findings, demonstrating that AI implementation significantly and positively affects employee satisfaction, customer behavior, and bank profitability. However, AI's effect on job obsolescence was not statistically significant, indicating minimal influence on workforce reductions. Overall, the results suggest that AI adoption enhances multiple operational facets of Nepal's banking sector, while concerns about job displacement remain largely unsubstantiated.

Conclusion

The findings of this study underscore the multifaceted impact of Artificial Intelligence (AI) on Nepal's banking sector. The analysis reveals that AI implementation positively influences employee satisfaction, customer behavior, and bank profitability, highlighting its potential to enhance operational performance and financial outcomes. Although AI shows a weaker correlation with customer service, this suggests that AI should act as a complementary tool to human interaction rather than a replacement. Furthermore, the lack of a significant relationship between AI and job obsolescence indicates that AI adoption does not necessarily

lead to widespread job losses, reaffirming the continued importance of human expertise within banking institutions.

These results emphasize the need for a cultural shift within the banking industry one that embraces technological innovation with transparency and builds trust among both employees and customers. AI should be seen as augmenting human intelligence, improving efficiency and service quality without displacing the workforce. This calls for focused workforce development strategies aimed at enhancing data science competencies and fostering continuous learning.

Successful AI integration in banking requires a comprehensive approach that involves collaboration among banks, regulators, and technology providers. Key challenges such as data security, ethical considerations, and regulatory compliance must be carefully managed to fully realize AI's benefits. Ultimately, AI presents a valuable competitive advantage by transforming customer experiences and operational processes, paving the way for a more innovative and efficient banking sector in Nepal.

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