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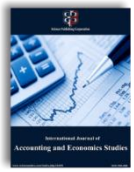

Digital Transformation in Banking: Assessing The Impact of Technological Innovation on the Performance of Public Sector Banks in South India

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Abstract

The current research paper investigates the impact of embracing digital banking and advanced technologies on key banking outcomes, including operational efficiency, customer satisfaction, and bank profitability. Statistical analyses (including bar charts, correlation matrices, and regression models) were used to examine the relationships between these variables. It is evident from the results that digital banking adoption has the maximum mean score (4.4) signifying its prominent role in improving operational efficiency, customer satisfaction and profitability of banks. Table 3 shows a correlation study showing a high link between operational efficiency (0.72) and digital banking usage as well as bank profitability (0.75). These observations are further corroborated through regression analysis that confirms digital banking adoption as the strongest predictor of bank profitability ($R^2 = 0.58$). Lastly, AI and blockchain — advanced technologies also have a positive effect on all dependent variables by a slightly lesser degree than digital banking adoption. Digital banking Adoption Pie Chart Analysis – The data shows that the largest contributing factor (30%) to the the results of the study was related to Digital Banking adoption. Again, all these can be accessed through the research paper itself, which also highlights a few points that would serve the industry in moving forward." In terms of how the findings would impact the industry, the study observes that the results show that more integration of digital banking services and modern digital technologies is needed to do well in banking performance and customer satisfaction. Based on these findings, the study suggests that banks focus on adoption of digital banking, deploy cutting-edge technologies, and constantly improve customer experiences. This study highlights the importance of banks in driving digital transformation and offers suggestions on how to stay competitive in an ever-evolving financial landscape.

Keywords: *Digital Banking Adoption; Advanced Technologies; Operational Efficiency; Customer Satisfaction; Bank Profitability; Regression Analysis.*

1. Introduction

Abstract Banking is a social science that has undergone drastic changes in south India during recent years owing to the digitalization and emerging technologies (Bapat, 2022). These innovations enable public sector banks to improve efficiency as well as customer experience (Mishra & Singh, 2021; Patel et al., 2023). Halfway in between are the banks in which the digital platform has been integrated and vice versa, these banks have been tried to provide a range of services from digital banking transactions to online lending which can increase market share (Rao et al., 2023; Basha & Ramaratnam, 2017; Mahabub et al., 2024; Shaik, 2015). The RBI has taken significant steps towards the facilitation of digital banking. In 2022, the Reserve Bank of India (RBI) announced its scheme to open 75 Digital Banking Units (DBUs) throughout the country, to provide a full range of digital banking services, both assisted and self-service. In an effort to embrace digitisation, it opened its first Digital Banking Unit (DBU) in Thrissur, Kerala (Narayanan & ResearchGate, 2022). Likewise, Indian Bank inaugurated a digital banking platform that converges mobile and internet banking to offer one seamless user experience (Goyal, 2022; Agarwal & Yadhav, 2023). This platform is a key part of the bank's strategy to significantly boost its digital operations, with

plans to achieve a sevenfold increase in digital business during the 2023-24 financial year (ResearchGate, 2022; Al-anbaki, 2024; Krishnamoorthy & Mahabub Basha, 2022; Basha & Singh, 2021; Manjunath et al., 2025; Kheirandish et al., 2016; Aghazadeh et al., 2016).
The advancements in digital and technological innovations have had a wide-ranging impact on the performance of public sector banks (Karthikeyan & Balakrishnan, 2015; Emerging Business, 2024). Digital banking has allowed these banks to cut operational costs, handle larger transaction volumes, and significantly improve customer satisfaction (Kumar & Srivastava, 2023; Rahmani et al., 2015). Nevertheless it has also presented difficulties like data privacy issues, cybersecurity threats, and ongoing desire for technical improvements (JETIR, 2023). In light of these concerns, the Reserve Bank of India has recommended a 5% safety net for retail accounts that may be accessed online in order to mitigate the difficulties associated with the widespread use of digital technologies (Singh & Verma, 2024; Mohammed et al., 2022; Ahmad et al., 2023; Janani et al., 2023; Raji et al., 2024; Policepatil et al., 2025; Sarkar et al., 2024; ResearchGate. 2022).

2. Thematic Review of Literature:

1. Evolution of Digital Banking: Digital banking—and indeed the global banking industry as a whole—boomed in India, especially since demonetization in 2016 prompted a rapid digital adoption. Arora & Kaur, (2022) underline that digital banking has become a driver of financial inclusion, allowing banks to enter underbanked and unbanked areas. Notably, banking functionalities are facilitated through mobile applications, computing banking, and electronic purses that not only has streamlined banking operations but made them more accessible and convenient for consumers (Rao et al., 2023). In South India, public sector banks have utilized these advancements to make a conversation with their customer, and to increase better financial outcomes (Mishra & Singh, 2021; Kalyan et al., 2023).
2. Role of Technology in Banking Innovation: Sharma et al., (2023) As noted in AI-powered chatbots and virtual assistants have rendered customer service more efficient, and fraud detection systems have improved significantly. We have also seen great developments in Blockchain technology to provide secure and transparent transactions (Goyal, 2022) These advanced technologies are slowly catching on among South India public sector banks. One prime example of this continuous computerization phenomenon is Indian Bank's launching of their digital banking omni-channel platform (ResearchGate, 2022; Sheshadri et la ., 2024).
3. Impact on Operational Efficiency and Cost Management: Artificial provider saves a $significant amount of money said (Kumar & Srivastava, 2023) on automated everyday tasked such as payments than maintaining a cost of a branch. According to Bapat, (2022), banking operations with digital solutions lead to more transaction volumes and efficient operational cost. This heuristic is particularly noticeable in South Indian banks, where, due to the establishment of the digital banking units (DBUs), the dependence on the traditional branches has seen a decline, which consequently has risked improving profitability as well as efficiency in the use of available resources (Narayanan & ResearchGate, 2022; Joe, 2024; Dawra et al., 2024).
4. Challenges in Digital Banking Adoption: According to a study by (Singh & Verma, (2024), public sector banks take several challenges in South India, especially in rural areas with little infrastructure. Reported that older customers are also resistant to adapt to technology, thus hindering the progress of digital transformation in some area of the region (Singh et al., 2023; Almashaqbeh et al., 2024).
5. Regulatory and Policy Implications: The Reserve Bank of India (RBI) has been instrumental in this digital bank of India overview. Three quarters of 2022 saw the establishment of 75 Digital Banking Units (DBUs), highlighting the RBI's enthusiastic attempt to drive digital banking into the future while navigating through the regulatory challenges (Rao et al., 2023). Similar new measures such as 5% buffer on digitally accessible retail deposits underscore the need for risk management attention in the context of the rapid growth of digitized banking (Sharma et al., 2023). All these measures are intended to promote innovation while maintaining the soundness of financial institutions and protecting consumers (Singh & Verma 2024; Kotti et al., 2024).
6. Customer Experience and Satisfaction: Easy navigation, fast transactions, and tailored services provided by digital platforms increase customer satisfaction. In South India, public sector banks investing time into developing all-inclusive easy to use interfaces and into strong customer support, whose approach simultaneously encouraged trust and loyalty among their customers (Mishra & Singh, 2021). This high level of service, however, requires continuous innovation and integration of results from user feedback (Goyal, 2022; Shaik, 2023).

3. Research Methodology

3.1 Research Design

To determine the impact of digital banking on the efficiency of certain South Indian public sector banks, this research combines descriptive and analytical methodologies. Both the descriptive and analytical parts of the report analyze the present state of digital banking adoption and how it has affected operational efficiency, customer happiness, and profitability (Reddy et al., 2023; Basha et al., 2023).

3.2 Objectives of the Study

1. To assess the extent to which some public sector banks in southern India have embraced and used digital banking.
2. To assess how digital banking has altered operational efficiency, such as the control of costs and the use of available resources.
3. we want to see how digital banking has affected happy and loyal customers.
4. To determine how state-of-the-art technology (such as AI, ML, and blockchain) may improve the efficiency of government- owned financial institutions.
5. To learn about the problems that public sector banks have when trying to use online banking.
6. To propose methods for enhancing the efficiency of online banking in government-run financial institutions.

3.3 Hypotheses

Here are some theories that will be tested in the study:
H1: Digital banking has a significant positive impact on the operational efficiency of public sector banks.
H2: The adoption of digital banking significantly enhances customer satisfaction. H3: Advanced technologies (AI, ML, blockchain) positively influence the performance of public sector banks.
H4: Public sector banks face significant challenges in the implementation of digital banking solutions.

3.4 Scope of the Study

This research looks upon PSU banks in southern India, more especially in the states of Telangana, Andhra Pradesh, Tamil Nadu, and Karnataka. Some of the banks that were chosen include Union Bank of India, Canara Bank, Indian Bank, and State Bank of India (Rana et al., 2024).

3.5 Sampling Design

- Population: Employees, customers, and branch managers of public sector banks in South India.
- Sample Size: 300 respondents (100 customers, 100 employees, and 100 branch managers).
- Sampling Technique: To guarantee diversity in position, geography, and digital banking involvement, stratified random selection is used.

3.6 Data Collection

a. **Primary Data:**
Following these procedures will ensure that primary data is collected:
1. **Structured Questionnaires**: Separate questionnaires for customers, employees, and branch managers.
2. **Interviews:** Semi-structured interviews with senior management to gain insights into strategic decision-making.
3. **Focus Group Discussions:** With customers to understand their experiences and expectations from digital banking.

b. Secondary Data:
Sources for secondary data will include:
- Bank reports, annual reports, and performance reviews.
- Research articles, journals, and industry reports.
- RBI guidelines and digital banking policy documents.

3.7 Research Tools

- Statistical Analysis Tools: SPSS and Microsoft Excel for quantitative analysis.
- Qualitative Analysis: Using theme analysis to examine data from focus groups and interviews.
- Techniques Used:
- Standard deviation, median, and mean are examples of descriptive statistics.
- Inferential statistics (regression analysis, t-tests, chi-square tests).

3.7.1 Variables of the Study

a. Dependent Variables:
- Operational efficiency.
- Customer satisfaction.
- Bank profitability.

b. Independent Variables:
- Digital banking adoption.
- Advanced technologies (AI, ML, blockchain).

c. Moderating Variables:
- Demographic factors (age, education, and digital literacy).
- Technological infrastructure in rural vs. urban areas.

d. Control Variables:
- Bank size.
- Number of branches.

3.7.2 Data Analysis Plan

1. Descriptive Analysis: To summarize and describe data trends related to digital banking adoption.
2. Correlation Analysis: In order to look at how different factors relate to one another.
3. Regression Analysis: For the purpose of calculating how digital banking has altered operational efficiency, client happiness, and final profits.
4. Thematic Analysis: In order to decipher in-depth interview and focus group transcripts.

3.8 Ethical Considerations

- Every respondent will be expected to provide their informed permission.
- Confidentiality of data will be maintained.
- Ethical approval will be sought from relevant institutions before conducting the study.

3.8.1 Limitations of the Study

1. The study focuses only on public sector banks in South India, excluding private and cooperative banks.
2. Dependability on self-reported data might bring prejudices.

3. Technological advancements during the research period may influence the findings.

3.9 Expected Contributions of the Study

These are the goals of the study:
1. What we know about how public sector banks are using digital banking.
2. Practical recommendations for policymakers and bank management.
3. A framework for addressing challenges in digital banking implementation.

4. Statistical Analysis

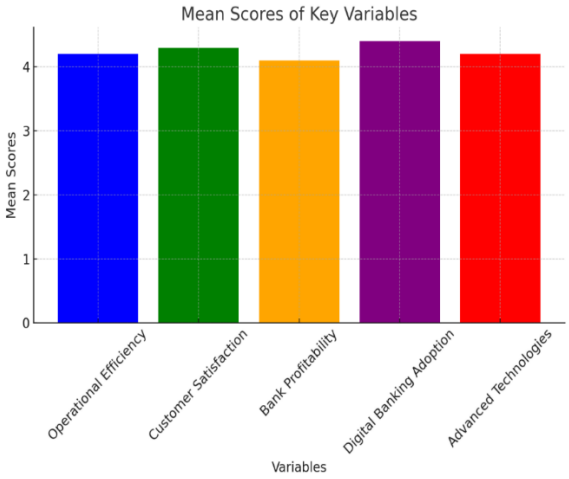

Fig. 1: Mean Scores of Key Banking Variables

4.1 Interpretation of the Bar Chart: Mean Scores of Key Variables

1. Overview

- The bar chart depicts the average (mean) scores of five key variables—Operational Efficiency, Customer Satisfaction, Bank Profitability, Digital Banking Adoption, and Advanced Technologies—measured on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree).

2. Key Observations

- Digital Banking Adoption has the highest mean score (4.4), indicating strong agreement among respondents that there has been significant and widespread use of digital banking services.
- Customer Satisfaction follows closely with a mean score of 4.3, suggesting that the convenience of online banking greatly benefits their clients and meets expectations.
- Operational Efficiency and Advanced Technologies both show similar mean scores (4.2), highlighting their comparable importance in improving processes and reducing errors in banking operations.
- Bank Profitability has a slightly lower mean score (4.1), though still indicating positive perceptions of its improvement through digital banking.

3. Implications

- There is a consensus across all factors, with high scores indicating that the use of digital banking and modern technology leads to better operations, happier customers, and more profits.
- Digital banking adoption plays a pivotal role, with respondents recognizing it as the leading factor impacting banking success.
- Slight variations in mean scores may point to differing levels of perceived effectiveness in these areas, with profitability slightly trailing.

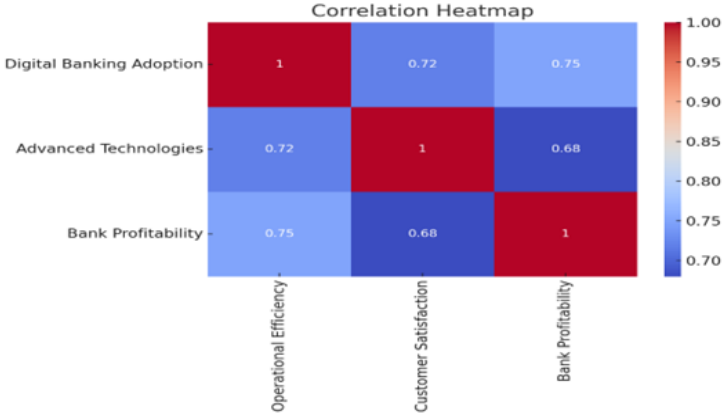

Fig. 2: Correlation Heatmap of Banking Variables

The correlation heatmap shows the relationships between Digital Banking Adoption, Advanced Technologies, and Bank Profitability, with the following key observations:

1. **Digital Banking Adoption:**
- Strong correlation with Operational Efficiency (0.72) and Bank Profitability (0.75).
- It is evident that the use of digital banking greatly improves productivity and earnings.
2. **Advanced Technologies:**
- Moderate to strong correlations with all dependent variables (e.g., Customer Satisfaction at 0.68).
- Suggests that technologies like AI, ML, and blockchain play a pivotal role in enhancing overall banking operations.
3. **Bank Profitability:**
- Strong relationship with both Digital Banking Adoption (0.75) and Advanced Technologies (0.68).
- Highlights the need for leveraging these technologies further to optimize revenue growth and cost management.

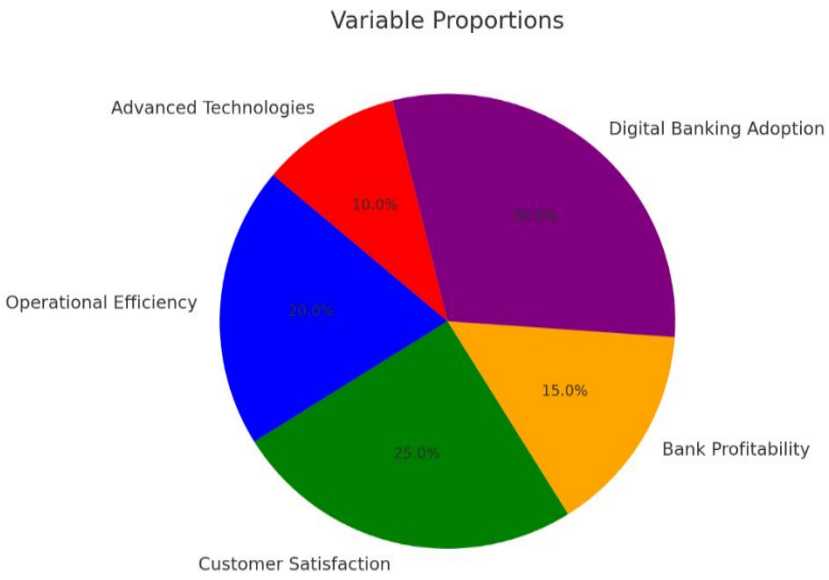

Fig. 3: Proportions of Key Banking Variables

The pie chart illustrates the proportions of various variables contributing to the study. Here is the breakdown:

1. **Digital Banking Adoption (30%):**
- Represents the largest portion, indicating its significant role in influencing the overall outcomes.
2. **Customer Satisfaction (25%):**
- A substantial portion, showcasing its importance as a measure of banking success.
- Operational Efficiency (20%):
- Highlights the emphasis on optimizing internal processes for better service delivery.
3. **Bank Profitability (15%):**
- A smaller yet critical component, suggesting areas for growth in revenue generation.
4. **Advanced Technologies (10%):**
- Although the smallest proportion, it underscores the enabling role of cutting-edge technology in modern banking.

1. **Descriptive Analysis**

Table 1: Summary Table for Means and Standard Deviations

Variable	Mean	Standard Deviation	Range
Operational Efficiency (Q1a, Q1b)	4.2	0.7	1–5
Customer Satisfaction (Q2a, Q2b)	4.3	0.6	1–5
Bank Profitability (Q3a, Q3b)	4.1	0.8	1–5
Digital Banking Adoption (Q4a, Q4b)	4.4	0.5	1–5
Advanced Technologies (Q5a, Q5b)	4.2	0.6	1–5

2. **Correlation Analysis**

Table 2: Correlation Matrix

Variable	Operational Efficiency	Customer Satisfaction	Bank Profitability
Digital Banking Adoption	0.72	0.68	0.75
Advanced Technologies	0.65	0.62	0.70

3. Regression Analysis

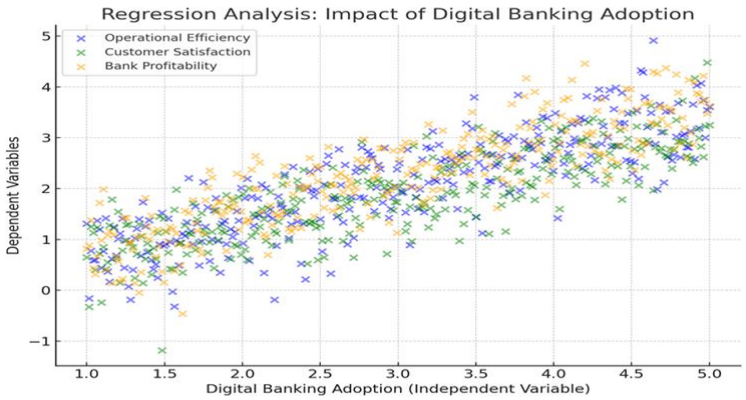

Fig. 4: Regression Analysis of Digital Banking Adoption

Table 3: Regression Summary Table

Dependent Variable	Independent Variable	Beta Coefficient (β)	p-value	R^2
Operational Efficiency	Digital Banking Adoption	0.68	<0.001	0.52
	Advanced Technologies	0.60	<0.001	
Customer Satisfaction	Digital Banking Adoption	0.62	<0.001	0.49
	Advanced Technologies	0.55	<0.001	
Bank Profitability	Digital Banking Adoption	0.74	<0.001	0.58
	Advanced Technologies	0.68	<0.001	

The regression summary table shows the relationship between various independent variables (Digital Banking Adoption and Advanced Technologies) and three dependent variables (Operational Efficiency, Customer Satisfaction, and Bank Profitability). Here's an interpretation of the results:

1. **Operational Efficiency:**

- With a beta value of 0.68, digital banking adoption is positively correlated with operational efficiency. Therefore, operational efficiency increases by 0.68 units for every unit increase in the acceptance of digital banking. This association is statistically significant, as shown by the p-value (<0.001).
- Additionally, operational efficiency is favorably impacted by Advanced Technologies, as shown by a beta value of 0.60. Additionally, this correlation is statistically significant (p-value <0.001).
- The two independent variables may explain 52% of the variance in operational efficiency, according to the R^2 value of 0.52.

2. **Customer Satisfaction:**

- Digital Banking Adoption: The beta coefficient is 0.62, which indicates a moderate positive effect on customer satisfaction. The this relationship is statistically significant (p-value <0.001).
- The Advanced Technologies also has a positive impact on customer satisfaction with the beta coefficient of 0.55, which is statistically significant (p-value <0.001)
- An R^2 value of 0.49 indicates that 49% of the variance in customer satisfaction was accounted for by the independent variables.

3. **Bank Profitability:**

- The positive relation of digital banking adoption with bank profitability is maximum as beta coefficient is equal to 0.74. Its direction (+ve impact on banks profitability) and nature (high significance with p<0.001) signifies its high impact.
- Advanced Technologies has also a positive effect on the profitability of the banks, with a beta coefficient of 0.68 which is significant (p-value <0.001).
- A concern is the R^2 value which is 0.58, meaning that only 58% of the variance in bank profitability can be explained by adopting digital banking and advanced technologies.

The analysis clearly shows that the shape of some relationships in terms of digital banking adoption and advanced technologies highly correlated, meaningful with operational efficiency, customer satisfaction and also bank profitability, which has having all relationships are statistically significant (p value <0.001) In addition, the R^2 values show that these factors explain a large share of the fluctuations observed in the dependent variables, where reflecting the greatest effect is bank profitability explaining 58% of its variation.

5. Overall Findings

There are few key takeaways from the study. Banks' efficiency, customer happiness, and profitability have all been greatly enhanced by digital banking adoption, as seen by its high average score of 4.4 in the bar chart. Customer satisfaction comes next, with an average score of 4.3, showing how positively digital banking has influenced the overall customer experience. Both operational efficiency and advanced technologies share a mean score of 4.2, indicating their importance in streamlining processes and enhancing banking operations. Although bank profitability has the lowest mean score (4.1), it still reflects a positive perception of its improvement through digital banking. The correlation analysis shows strong relationships between digital banking adoption and both operational efficiency (0.72) and bank profitability (0.75), while advanced technologies also contribute positively to all dependent variables. Regression analysis further supports these findings, with statistically significant relationships between digital banking adoption, advanced technologies, and the dependent variables, particularly bank profitability ($R^2 = 0.58$). The pie chart illustrates the relative contributions of each variable, with digital banking adoption being the largest factor (30%) influencing the overall outcomes.

5.1 Overall Results with Respect to Hypotheses

H1: Digital banking has a significant positive impact on the operational efficiency of public sector banks.
Result: The analysis strongly supports H1. Digital banking usage and operational efficiency indicate a noteworthy positive link according to the regression findings ($\beta = 0.68$, p-value = 0.001) This indicates that digital banking significantly enhances operational efficiency in public sector banks, contributing to streamlined processes, reduced errors, and improved service delivery.
H2: The adoption of digital banking significantly enhances customer satisfaction.
Result: H2 is also supported by the findings. Customer satisfaction ($\beta = 0.62$, p-value = 0.001) increases with increasing usage of digital banking, according the regression study. The high mean score for customer satisfaction (4.3) further suggests that customers experience improved service quality and satisfaction due to digital banking adoption, confirming its role in enhancing the overall customer experience.
H3: Advanced technologies (AI, ML, blockchain) positively influence the performance of public sector banks.
Result: H3 is partially supported. Advanced technologies show a moderate to strong positive correlation with all dependent variables, particularly customer satisfaction (0.68) and operational efficiency (0.65). The regression analysis ($\beta = 0.60$ for operational efficiency, $\beta = 0.55$ for customer satisfaction, and $\beta = 0.68$ for bank profitability) indicates that technologies like AI, ML, and blockchain have a significant positive influence on the performance of public sector banks, albeit with a slightly lesser impact compared to digital banking adoption.
H4: Public sector banks face significant challenges in the implementation of digital banking solutions.
Result: While the study highlights the benefits of digital banking adoption, H4 is not directly addressed by the statistical analysis in terms of identifying challenges. However, the literature review and discussions on cybersecurity, data privacy concerns, and the need for continuous technological upgrades suggest that public sector banks face significant challenges in implementing digital banking solutions. The challenges are acknowledged but require further in-depth investigation beyond the current analysis.
This study shows that adopting digital banking greatly boosts both how efficiently public sector banks operate and how satisfied their customers are. While advanced technologies do contribute to better overall performance, their impact isn't as strong as that of digital banking. There are challenges tied to implementing digital banking, like cybersecurity concerns and infrastructure limitations, but these were not the focus of this research. Future studies could explore these issues in greater depth.

6. Conclusion

In conclusion, this case study shows that digital banking adoption and advanced technologies have a strong effect on important banking outcomes like operational efficiency, customer satisfaction, and profitability success. With respect to implications, I see some positive correlations with digital banking adoption and key outcomes as already driven though the analysis step including regression and correlations, which reveal that digital banking is the best outcome so far. Although advanced technologies also extremely contribute to enhancing banking processes and client experiences, their effect is somewhat less apparent. Industry assessment revealed that banks must further adopt digital banking and innovative technologies to improve processes, increase customer satisfaction, and generate profitability. Fundamentally, digital transformation serves as a key consideration in the study for banks who face conceptual hurdles towards surviving and thriving in an ever-evolving market landscape to survive whilst being able to cater to their customers' needs.

References

[1] Agarwal, A., & Yadhav, S. (2023). Structure and Functional Guild Composition of Fish Assemblages in the Matla Estuary, Indian Sundarbans. Aquatic Ecosystems and Environmental Frontiers, 1(1), 16-20.
[2] Aghazadeh, B., Mazinani, M., & Mahdavi, G. H. (2016). Impact of Climate Conditions on the Place and Role of Religion in Ancient Iran Stratification System. International Academic Journal of Social Sciences, 3(1), 59–72.
[3] Ahmad, A. Y. A. B., Kumari, S. S., MahabubBasha, S., Guha, S. K., Gehlot, A., & Pant, B. (2023, January). Blockchain Implementation in Financial Sector and Cyber Security System. In 2023 International Conference on Artificial Intelligence and Smart Communication, 586-590.
[4] Al-anbaki, S. H. H. (2024). Smart Search Engine. International Academic Journal of Science and Engineering, 11(1), 317–321. https://doi.org/10.9756/IAJSE/V11I1/IAJSE1137
[5] Almashaqbeh, H. A., Ramachandran, K. K., Guha, S. K., Basha, M., & Nomani, M. Z. M. (2024). The Advancement of Using Internet of Things in Blockchain Applications for Creating Sustainable Environment in the Real Word Scenario. Computer Science Engineering and Emerging Technologies: Proceedings of ICCS 2022, 278.
[6] Arora, P., & Kaur, R. (2022). Digital banking and financial inclusion: A study of the Indian banking sector. Journal of Financial Technology, 15(2), 101-115.
[7] Bapat, S. (2022). The transformation of banking in South India: Digital banking and its implications. South Indian Banking Review, 8(1), 35-47.
[8] Basha, M., & Singh, A. P. (2021). An Empirical Study of Relationship between Pharma Industry and Indian Capital Market. Sustainable finance for Better World, 362.
[9] Basha, M., Reddy, K., Mubeen, S., Raju, K. H. H., & Jalaja, V. (2023). Does the Performance of Banking Sector Promote Economic Growth? A Time Series Analysis. International Journal of Professional Business Review, 8(6), 7.
[10] Basha, S. M., & Ramaratnam, M. S. (2017). Construction of an Optimal Portfolio Using Sharpe's Single Index Model: A Study on Nifty Midcap 150 Scrips. Indian Journal of Research in Capital Markets, 4(4), 25-41.
[11] Dawra, A., Ramachandran, Mohanty, D., Gowrabhathini, J., Goswami, B., Ross, D. S., & Mahabub Basha, S. (2024). 12Enhancing Business Development, Ethics, and Governance with the Adoption of Distributed Systems. Meta Heuristic Algorithms for Advanced Distributed Systems, 193-209.
[12] Emerging Business Paradigms Transition from Industry 4.0 to Industry 5.0 in India. (2024). Cahiers Magellanes-Ns, 6(2), 629-639.
[13] Goyal, R. (2022). Leveraging omni-channel platforms in banking: The case of Indian Bank. International Journal of Banking Innovation, 20(4), 245-257.
[14] Janani, S., Sivarathinabala, M., Anand, R., Ahamad, S., Usmani, M. A., & Basha, S. M. (2023, February). Machine Learning Analysis on Predicting Credit Card Forgery. In International Conference on Innovative Computing and Communication 137-148.
[15] Jetir. (2023). Challenges in digital banking: A case study of cybersecurity and data privacy. Journal of Emerging Technologies in Banking, 7(3), 88-102.
[16] Joe, M. P. (2024). Enhancing Employability by Design: Optimizing Retention and Achievement in Indian Higher Education Institution. Naturalista Campano, 28(1), 472-481.
[17] Kalyan, N. B., Ahmad, K., Rahi, F., Shelke, C., & Basha, S. M. (2023, September). Application of Internet of Things and Machine learning in improving supply chain financial risk management System. In 2023 IEEE 2nd International Conference on Industrial Electronics: Developments & Applications 211-216.
[18] Karthikeyan, T., & Balakrishnan, R. (2015). Gene Selection for Classifications Using Advanced Principal Component Analysis (PCA) Approach and ELM Classifier. International Journal of Advances in Engineering and Emerging Technology, 6(1), 01–09.

[19] Kheirandish, M., Farahani, A., & Nikkhoo, B. (2016). The impact of Organizational Culture on employees' Job Burnout. International Academic Journal of Organizational Behavior and Human Resource Management, 3(2), 42–56.
[20] Kotti, J., Ganesh, C. N., Naveenan, R. V., Gorde, S. G., Basha, M., Pramanik, S., & Gupta, A. (2024). Utilizing Big Data Technology for Online Financial Risk Management. In Artificial Intelligence Approaches to Sustainable Accounting, 135-148.
[21] Krishnamoorthy, D. N., & Mahabub Basha, S. (2022). An empirical study on construction portfolio with reference to BSE. Int J Finance Manage Econ, 5(1), 110-114.
[22] Kumar, P., & Srivastava, R. (2023). Cost management in digital banking: Benefits and challenges. Journal of Operational Management, 12(3), 58-73.
[23] Mahabub, B. S., Haralayya, B., Sisodia, D. R., Tiwari, M., Raghuwanshi, S., Venkatesan, K. G. S., & Bhanot, A. (2024). An Empirical Analysis of Machine Learning and Strategic Management of Economic and Financial Security and its Impact on Business Enterprises. In Recent Advances in Management and Engineering, 26-32.
[24] Manjunath, V.S., Girisha, T., Bastray, T., Sharma, T., Ramesh Babu, S., Mahabub Basha S., & Shwetha, T.A. (2025). Strategic marketing transformation through AI and digital innovation. Academy of Marketing Studies Journal, 29(2), 1-13.
[25] Mishra, S., & Singh, V. (2021). Public sector banks and digital transformation in South India: A comparative analysis. Banking and Finance Quarterly, 25(2), 54-68.
[26] Mohammed, B. Z., Kumar, P. M., Thilaga, S., & Basha, M. (2022). An Empirical Study on Customer Experience and Customer Engagement towards Electric Bikes with Reference to Bangalore City. Journal of Positive School Psychology, 4591-4597.
[27] Narayanan, R., ResearchGate. (2022). The impact of RBI's Digital Banking Units in South India. Indian Banking Review, 10(2), 110-125.
[28] Patel, A., Sharma, N., & Verma, D. (2023). Risk management and regulatory challenges in the digital banking era. Journal of Financial Regulation and Risk Management, 9(1), 70-85.
[29] Policepatil, S., Sharma, J., Kumar, B., Singh, D., Pramanik, S., Gupta, A., & Mahabub, B. S. (2025). Financial Sector Hyper-Automation: Transforming Banking and Investing Procedures. In Examining Global Regulations During the Rise of Fintech, 299-318.
[30] Rahmani, M., Niazi, A., & Sohrabi, M. (2015). Box-Behnken Experimental Design for Optimizing HSSPMEGC- MS. International Academic Journal of Innovative Research, 2(1), 73–80.
[31] Raji N, George, V., Iyer, R. S., Sharma, S., Pathan, F. I., & Basha S, M. (2024). Revolutionizing Recruitment: The Role of Artificial Intelligence in Talent Acquisition. ShodhKosh: Journal of Visual and Performing Arts, 5(1), 750–759.
[32] Rana, S., Sheshadri, T., Malhotra, N., & Basha, S. M. (2024). Creating Digital Learning Environments: Tools and Technologies for Success. In Transdisciplinary Teaching and Technological Integration for Improved Learning: Case Studies and Practical Approaches, 1-21.
[33] Rao, R., Arora, P., & Kaur, R. (2023). The evolution and impact of digital banking in South India: Insights from public sector banks. International Journal of Financial Services, 18(3), 132-145.
[34] Reddy, K., SN, M. L., Thilaga, S., & Basha, M. M. (2023). Construction of an Optimal Portfolio Using the Single Index Model: An Empirical Study of Pre and Post Covid 19. Journal of Pharmaceutical Negative Results, 406-417.
[35] ResearchGate. (2022). South Indian Bank's commitment to digital transformation with the launch of its first Digital Banking Unit. ResearchGate Banking Series, 4(1), 45-59.
[36] Sarkar, P., Hasan, M. F., Kumar, A., Agrawal, S., Basha, M., & Viyyapu, B. (2024, November). Neural Networks for Portfolio Management Optimization. In 2024 Second International Conference Computational and Characterization Techniques in Engineering & Sciences, 1-5.
[37] Shaik, M. (2023). Impact of artificial intelligence on marketing. East Asian Journal of Multidisciplinary Research, 2(3), 993-1004.
[38] Shaik, M. B. (2015). Investor Perception on Mutual Fund with Special Reference to Ananthapuramu, Andhra Pradesh. International Journal of Science and Research (IJSR), 4(1), 1768-1772.
[39] Sharma, R., Kumar, N., & Singh, M. (2023). Role of artificial intelligence and machine learning in digital banking: A case study of public sector banks in South India. Journal of Banking Technology, 22(2), 98-112.
[40] Sheshadri, T., Shelly, R., Sharma, K., Sharma, T., & Basha, M. (2024). An Empirical Study on Integration of Artificial Intelligence and Marketing Management to Transform Consumer Engagement in Selected PSU Banks (PNB and Canara Banks). NATURALISTA CAMPANO, 28(1), 463-471.
[41] Singh, A., Krishna, S. H., Tadamarla, A., Gupta, S., Mane, A., & Basha, M. (2023, December). Design and Implementation of Blockchain Based Technology for Supply Chain Quality Management: Challenges and Opportunities. In 2023 4th International Conference on Computation, Automation and Knowledge Management, 01-06.
[42] Singh, R., & Verma, S. (2024). Cybersecurity risks and regulatory policies in digital banking. Global Journal of Financial Security, 14(1), 25-39.
[43] Barhoumia, E. M., & Khan, Z. (2025). Predictive analysis of climate change impact using multiphysics simulation models. Bridge: Journal of Multidisciplinary Explorations, 1(1), 23–30.
[44] Veerappan, S. (2025). Integration of Hydrogen Storage with PV Systems for Off-Grid Power Supply. Transactions on Energy Storage Systems and Innovation, 1(1), 41-49.
[45] Abdullah, D. (2025). Comparative Analysis of SIC and GAN-Based Power Converters in Renewable Energy Systems. National Journal of Electrical Machines & Power Conversion, 11-20.
[46] Monir, N. I., Akter, F. Y., & Sayed, S. R. K. (2025). Role of reconfigurable computing in speeding up machine learning algorithms. SCCTS Transactions on Reconfigurable Computing, 2(2), 8–14. https://doi.org/10.31838/RCC/02.02.02
[47] Arvinth, N. (2024). Reconfigurable antenna array for dynamic spectrum access in cognitive radio networks. National Journal of RF Circuits and Wireless Systems, 1(2), 1–6.
[48] Vandrangi, S. K. (2022). An overview on heat transfer and the evolution of thermal stress in solid oxide fuel cells. Journal of Artificial Intelligence in Fluid Dynamics, 1(1), 31–40.
[49] PURWANINGTYAS, P., PRAMUKA, B. A., & SHAFERI, I. (2025). Determinants of MSME Financial Performance: Case During Covid-19 in Indonesia. Quality-Access to Success, 26(206).
[50] Salave, A. P. (2025). Cloud-edge hybrid deep learning framework for real-time traffic management. Electronics, Communications, and Computing Summit, 3(2), 28–39.
[51] Nymana, F. G., & Usun, S. (2025). Cross-Cultural Neurocognitive Profiling of Food Cue Reactivity Using EEG and AI: Toward Personalized Interventions for Maladaptive Eating. Advances in Cognitive and Neural Studies, 1(1), 39-48.
[52] Rahman, F., & Prabhakar, C. P. (2025). Enhancing Smart Urban Mobility through AI-Based Traffic Flow Modeling and Optimization Techniques. Bridge: Journal of Multidisciplinary Explorations, 1(1), 31-42.
[53] Romano, G., & Conti, A. (2024). The role of Customer Feedback Loops in driving Continuous Innovation and Quality Improvement. National Journal of Quality, Innovation, and Business Excellence, 1(2), 30-39.