Bodhi International Journal of
Research in Humanities, Arts and Science

Vol. 10 Special Issue 2 December 2025
E-ISSN: 2456-5571

An Analysis on the Impact of Artificial Intelligence in Banking Sector in Thanjavur District Tamil Nadu

Dr. G. Mahendran[1] Dr. S. Ahila[2]
G. Selvaganapathy[3] & J. Jayalakshmi[4]

[1]*Assistant Professor of Economics Government Arts College (A) Kumbakonam, Tamil Nadu*
[2]*Assistant Professor of Economics Government Arts College, Chidambaram, Tamil Nadu*
[3&4] *Ph. D. Research Scholars, Department of Economics, Annamalai University, Chidambaram, Tamil Nadu*

Open Access

Manuscript ID:
BIJ-SPL2-Dec25-ECO-014

Subject: Economics

Received : 19.08.2025
Accepted : 04.09.2025
Published : 31.12.2025

DOI: 10.64938/bijsi.v10si2.25.Dec014

Abstract

Artificial Intelligence (AI) is transforming the banking sector by automating processes, improving customer service, and enhancing security. AI-powered chatbots provide 24/7 customer support, while machine learning algorithms help in fraud detection by analysing vast amounts of transactional data in real time. This study investigates the impact of Artificial Intelligence (AI) on the banking sector in Thanjavur District, focusing on how AI is transforming banking operations and customer experiences. Through a survey of 150 bank customers, the research explores the extent of AI adoption, its perceived benefits, and the challenges faced by both banks and customers. The key AI applications, such as chatbots, fraud detection systems, and personalized financial services, were found to significantly enhance operational efficiency and customer satisfaction. However, concerns about data privacy, job displacement, and AI transparency were also noted. The study concludes that while AI is positively reshaping banking in Tirunelveli District, addressing customer concerns through stronger data protection policies and transparent AI practices is essential for maximizing its potential.

Keywords: artificial intelligence, banking sector, customer service, security, customer satisfaction, operational efficiency

Introduction

The financial sector has undergone profound transformations over the past few decades, driven by rapid advancements in technology. Among the many technological innovations that are reshaping the landscape, Artificial Intelligence (AI) stands out as one of the most impactful. AI, a branch of computer science that enables machines to simulate human intelligence and decision-making, has found widespread applications across numerous industries, including healthcare, education, manufacturing, and notably, banking. In the banking sector, AI is revolutionizing everything from operational efficiency and customer service to risk management and regulatory compliance, marking a new era of digital banking.

Traditionally, banking has been synonymous with human-intensive processes, with tasks such as customer service, credit approvals, and fraud detection requiring significant manpower and time. However, the adoption of AI is steadily automating many of these tasks, allowing banks to deliver faster, more reliable, and efficient services. AI technologies such as machine learning, natural language processing (NLP), and robotic process automation (RPA) are streamlining banking operations, minimizing human error, and significantly reducing operational costs. This is especially important in a

fast-paced financial environment where efficiency and accuracy are critical for both competitiveness and regulatory compliance.

AI's potential to revolutionize customer interaction has been one of its most prominent contributions to banking. AI-driven tools like chatbots, virtual assistants, and voice recognition systems are enabling banks to offer 24/7 customer support, handling a wide range of inquiries from balance checks to more complex banking needs, such as loan eligibility assessments. These AI-driven interactions are not only faster but are also highly accurate, reducing the likelihood of mistakes and enabling banks to handle large volumes of customer queries efficiently. Moreover, AI's ability to process vast amounts of data in real time allows banks to provide personalized financial advice, helping customers manage their finances better based on their spending habits, savings patterns, and investment goals.

This study aims to explore the impact of Artificial Intelligence on the banking sector in Tirunelveli District, focusing on both the operational changes within banks and the perceptions of customers. By analysing the extent of AI adoption, the benefits it offers, and the challenges it presents, this research seeks to provide insights into how AI is transforming banking in this region.

Review of Literature

Shetty et al. (2022) in their research paper explained that after the implementation of AI in Banks it is difficult to access some of them and at the starting stage people not ready to take risk. The study's data was gathered from primary and secondary sources of data. This study was done to know how the implementation of AI in banks impacted to the customer and to the bankers, is it really helps to the work or transaction or not. A variety of hypothesis were developed and evaluated in order to fulfil the goals of valuable suggestion that would benefit the customer for their easy transaction and to the banker to reduce burden of work. We gathered data for the study from both the primary and secondary aspects of data. The primary data collected from the customer is 170 and from the banker is 30 samples. As per customer point of view and banker's point of view total 200 primary data were collected for the study. From axis bank, ICICI bank, Karnataka bank, HDFC bank, etc. primary data collected as a bankerpoint of view. For more information, secondary data were used that is from books, magazines, and from the websites. And chi square, correlation and regression statistical tools are used for the test.

Vikram Kumar Sharma (2024) This study intends to explore the elements that have an impact in determining the intent of customers to use artificial intelligence (AI) in banking services in India's banking sector. Using the SmartPLS 3.0 software, the data were evaluated to determine the key factors influencing their intention to use AI.

Vijai.C (2019) The banking sector is becoming one of the first adopters of Artificial Intelligence. Banks are exploring and implementing technology in various ways. Artificial Intelligence is getting better and smarter day by day. Development that Artificial Intelligence offers to FinTech and the different ways in which it can improve the operations of an Indian banking sector.

Subhajit Pahari and Aruna Polisettyet.al., (2023) The Indian banking sector has been at the forefront of accepting innovative technologies and has been changing over time. Indian banks are utilizing AI-powered technologies to automate labour-intensive operations, reduce operational costs, and increase revenue growth potential. Already, machines handle a large portion of mundane tasks. In order to increase security and transparency in payment fraud detection and prevention systems, financial institutions are also utilizing artificial intelligence (AI).

Padmanabhan and Metilda (2021) in their study stated that the banking sector is witnessing round breaking changes: foremost being the rise in customer centricity. Tech-savvy customers, exposed to advanced technologies in their day-to-day lives, expect banks to deliver seamless experiences. To meet these expectations, banks have expanded their industry landscape to retail, IT and telecom to enable services like mobile banking, e-banking and real-

time money transfers. While these advancements have enabled customers to avail most of the banking services at their fingertips anytime, anywhere, it has also come with a cost for the banking sector. This study also gives an insight into the positive and negative impact of an Artificial Intelligence using in Indian Banking Industries. This study is of descriptive nature so all the required and relevant data have been taken up from various journals, magazines for published papers and websites.

Objectives of the Study

1. To study the socio-demographic profile of the respondents in the study area.
2. To examine the impact of Artificial Intelligence in banking sector in Thanjavur district.
3. To analyse the problems faced by the respondents in using Artificial Intelligence in the study area.

Research Methodology

The study adopts a descriptive research design to explore the impact of Artificial Intelligence (AI) in the banking sector within Thanjavur District. The sample comprised 150 respondents, consisting of banking customers from various public and private sector banks operating in Thanjavur District. The sample included individuals from diverse demographic backgrounds such as age, gender, educational qualifications, and employment status to ensure a comprehensive understanding of customer perspectives. Primary data was gathered using a structured questionnaire, which was distributed both physically at bank branches and digitally through online survey platforms to ensure broader participation. Once the data was collected, it was entered and processed using Statistical Package for the Social Sciences (SPSS) software. The data was analyzed using both descriptive and inferential statistics. The secondary data has been collected from various books, journals, websites, etc.,

Data Analysis

This section of the study presents the analysis of data and its interpretation. The following table 1 depicts the socio-demographic profile of the respondents,

Table 1 Socio-demographic Profile of the Respondents

Socio-demographic variables	Categories	No of Respondents	Percentage
Gender	Male	85	57
	Female	65	43
	Total	150	100
Age	Less than 25 years	15	10
	25-35 years	42	28
	35-45 years	57	38
	45-55 years	24	16
	Above 55 years	12	8
	Total	150	100
Education	Graduate	42	28
	Post Graduate	68	45
	Doctorate	30	20
	Others	10	7
	Total	150	100
Monthly Household Income	Less than 15000	27	18
	15001-30000	30	20
	30001-45000	68	45
	45001-60000	15	10

	Above 60001	10	7
	Total	150	100
Occupation	Unemployed	9	6
	Self-Employed	33	22
	Private employee	66	44
	Government employee	42	28
	Total	150	100
Area of Residence	Urban	96	64
	Semi-urban	36	24
	Rural	18	12
	Total	150	100
Nature of Bank	benefits	No of Respondents	Percentage
	Private sector bank	75	50
	Private sector bank	75	50
	Total	150	100
Perceived Benefits	benefits	No of Respondents	Percentage
	Efficiency and speed	66	44
	Enhanced security	39	26
	Personalization	30	20
	Customer convenience	15	10
	Total	150	100

Source: Primary data

A total of 150 respondents' data were gathered for the study from all throughout the Thanjavur district area; 57% of them were male and 43% were females.

The above table clearly shows that 10% of the respondents are less than 25 years of age, 28% of the respondents are 25-35 years of age, 38% of the respondents are 35-45 years of age, 16% of the respondents are 45-55 years of age and the remaining 8% of the respondents are above 55 years of age. It is clear from the table that 6% of the respondents are unemployed, 22% of the respondents are self-employed, 44% of the respondents are private employees and 28% of the respondents are government employees. It is also found from the table that 64% of the respondents are from urban areas, 24% of the respondents are from semi-urban areas and the remaining 12% of the respondents are from rural areas.

The majority of responders 60% of them had postgraduate degrees. The majority of respondents (45%) fell into the income range of 30001-45000 per month.

The above table Nature of Bank shows that 45% of the respondents are account holders of Private sector banks and 50% of the respondents are account holders of Public sector banks.

The table Perceived benefits depicts that 44% of the respondents perceive that Artificial intelligence enhance efficiency and speed in banking, 26% of the respondents perceive that AI enhances security, 20% of the respondents perceive that AI increases personalization and 10% of the respondents perceive AI increases customer satisfaction in banking.

Table 2 Problems Faced by the Respondents in Using Artificial Intelligence in Banking Sector

S. no	Problems	Garret Mean Score	Rank
1	Lack of understanding and trust in AI	74.03	I
2	Privacy and Security concern	62.30	III
3	Inconsistent Customer Service Experience	52.94	VI
4	Complexity of AI Interfaces	59.15	IV
5	Technical Glitches and Downtime	56.06	V
6	Overdependence on Technology	49.23	VII
7	Difficulty Adapting to Change	66.46	II

Source: Primary data

The above table 2 shows that Lack of understanding and trust in AI is ranked first with a garret mean score of 74.03, Difficulty Adapting to Change is ranked second with a mean score of 66.46 and Privacy and Security concern is ranked third with a mean score of 62.30. Complexity of AI Interfaces is ranked fourth with a mean score of 59.15, followed by Technical Glitches and Downtime (Mean score: 56.06); Inconsistent Customer Service Experience (Mean score: 52.94) and Overdependence on Technology (Mean score: 49.23).

Suggestions of the Study

- Banks should develop a clear AI strategy that aligns with their long-term business goals. AI should be used to complement human efforts, not replace them entirely. Strategic planning will ensure AI is integrated into areas where it can have the most impact, such as customer service, fraud detection, and process automation.
- Banks should invest in reskilling and upskilling their workforce to adapt to AI-driven environments. Training programs focused on working alongside AI tools will help employees understand and maximize the potential of AI, while reducing the fear of job displacement.
- Banks must prioritize ethical AI usage, ensuring transparency, fairness, and accountability in AI decision-making processes. This includes addressing issues such as algorithmic bias, privacy concerns, and ensuring that AI models comply with regulatory standards.
- As AI adoption grows, banks must strengthen their cybersecurity frameworks. AI systems are highly susceptible to cyber threats, and securing these systems is critical to protect sensitive financial and customer data.
- As AI regulation evolves, banks must stay informed about legal and regulatory changes related to AI. Establishing a compliance team dedicated to AI technologies will help ensure that banks remain compliant with both domestic and international standards.
- Banks should create cross-functional teams that include AI specialists, business strategists, risk managers, and customer experience experts. This will facilitate a holistic approach to AI implementation and ensure that different aspects of the organization are considered.

Conclusion

The study on the impact of Artificial Intelligence (AI) in the banking sector in Thanjavur District highlights the transformative role AI is playing in reshaping banking operations and customer experiences. AI has proven to be an essential tool in enhancing operational efficiency, improving customer service, and strengthening security measures. From automating routine tasks to detecting fraud in real time, AI has brought about significant improvements in the way banks function. Customers, in turn, benefit from faster, more personalized services that cater to their financial needs with greater precision. However, the findings also reveal that while there is growing acceptance of AI among

customers in thanjavur, there are lingering concerns, particularly around data privacy, security, and the transparency of AI systems. Ensuring that AI algorithms are unbiased, explainable, and secure is crucial to fostering customer trust in these technologies. Moreover, the successful implementation of AI requires continuous customer education and awareness programs to bridge the gap between technological advancements and customer understanding.

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