

# Assessing the Impact of Artificial Intelligence Adoption on Customer Satisfaction in Indian Banking Sector

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## Abstract

Artificial Intelligence (AI) stands as a technological tool of transforming the traditional Indian banking sector into a modernized financial service provider. The emergence of artificial intelligence (AI) has made a paradigm shift in the banking sector that enhances customer satisfaction, decision-making and operational efficiency. The role of AI with data analytics helps financial institutions prevent cyber security issues, fraudulent transactions and foster compliance. Tools such as AI-powered chatbots, digital payment advisors, and biometric fraud detection systems have shown prominence in improving the quality of customer service in the banking sector. AI has paved way for the customers to be aware of financial options and make more informed financial decisions. AI in banking generally leads to increased customer satisfaction due to enhanced efficiency and personalized experiences, but also raises concerns about privacy and the role of human interaction. Therefore, the present study is an attempt to examine the customer perception and satisfaction towards the application of Artificial Intelligence (AI) in the Indian Banking sector. A survey methodology was conducted among 119 respondents who are customers of the private sector banks both men and women between the age group of 25 and 60 years. The structured questionnaire including the demographic profile and questions related to customer perception and satisfaction in using AI powered banking services is used to collect data. Structural equation Modeling (SEM) is employed to analyze the data. The findings of the study reveals the customer perception and satisfaction towards AI enabled services in the Indian banking sector and provides recommendation for banks to offer customer education and transparency to build trust and ensure secured transactions. The implications of the study underscore the significance of AI and its strategic implementation including digital access, and regulatory measures to enable customer-centric AI integration in the banking sector.

**Keywords:** Artificial Intelligence, customer perception, customer satisfaction, banking sector, digital banking

## Introduction

The current scenario of the business environment is driving towards technological operations and functionalities have forced organizations to adopt digital transformations in their business operations across industries. Emerging technological upgradations and advancements in business has brought changes in the day-to-day activities and functioning of the firm that mandates the organization and

institutions to generate and explore innovative ideas in order to provide value added services to their customers in the long term. Being the backbone of the nation's economic development, the banking sector is found to emerge as one of the prominent customer-centric models aiming to offer ease, convenience and secured banking services. Banking services are extended into retail, IT, and telecommunications beyond their traditional boundaries to provide mobile banking, e-banking, and real-time money transfer that facilitates customer with enhanced secure transaction. The recent innovations in banking services provide customized digital banking services that provide user-friendly access anytime, anywhere. Many empirical studies have been conducted in the banking sector and its digital transformation outcomes and challenges. Artificial Intelligence (AI) is found to be the vibrant technological development revolutionizing banking sector with its features of data analysis, market trends prediction and fraud risks, and enhancing customer satisfaction. AI supports financial institutions to better understand the market demand, customer expectations and needs, digital interactions and transactions thereby offering improved banking services with human-like intelligence. The modern banking systems largely rely on the AI driven technology so as to deliver secure and faster services and responses to the customers. The adoption of AI optimizes the bank operations efficiently with proper legal, ethical and compliance structure in order to ensure that the interactions are carried out with minimal time, accuracy and reduced error. In addition, it enables the banks to process large voluminous data, generate report, quicker transaction with security and privacy that not only improves the quality of service but also extended the customer base, reduce operational expenses, increase revenue and profitability that leads to better customer satisfaction. By learning from past interactions, AI enables banks to personalize products and services, fostering meaningful customer engagement and long-term loyalty. AI-enabled banking services is perceived by various factors such as convenience, customization, confidential and improved efficiency. AI-enabled services are found to provide user-friendly interfaces which in turn enhance customer control and enjoyment fostering satisfaction and purchase intentions (Lopes et al., 2024). Customization in AI enabled services is yet another feature that offers tailor-made services and experiences to individual needs, boosts engagement and long-term customer loyalty especially in the banking sector, where personalized services significantly influence customer retention and trust (Tulcanaza-Prieto et al., 2023). AI-powered applications including chatbots and automated support systems are perceived as highly efficient, leading to stronger satisfaction levels and brand loyalty, highlighting the functional importance of AI enabled services in delivering consistent, high-quality service (Singh & Singh, 2024). The incorporation of AI services in the fields of retail and banking, has evident a positive impact through tailored experiences and efficient service delivery that leads to customer loyalty and satisfaction.

### **Review of Literature**

Artificial intelligence (AI) is transforming the banking sector by significantly enhancing customer service, security, operational efficiency, and innovation. Research evidence reveal that AI-powered chatbots are available around the clock assisting customers by responding to inquiries, resolving problems, and navigating them through banking services (Kumar & Patel, 2021). AI enabled services are designed to provide better banking and financial analysis and suggestions for the customers that leads to higher level of trust, engagement and satisfaction (Zhang et al., 2022). Further, AI with its well-equipped protocols and algorithms provide the user with personalized transaction and interaction with the primary objective of deploying efficient user-friendly operations and services. Empirical studies show that AI plays a major role in enhancing banking services like fraud detection, cyber security, legal framework and analysis the

transactions and interactions in real time (Chakraborty & Dey, 2020). AI tools have been utilized in modern credit scoring models enabling banks to assess creditworthiness with greater accuracy, leading to more informed lending decisions. In addition, automated systems support regulatory compliance by streamlining the monitoring and reporting of financial transactions, which helps reduce the likelihood of legal penalties (Lee & Chen, 2021). Operational efficiency is another key benefit, as AI enables the automation of repetitive administrative tasks, such as data entry and document processing, freeing up staff to focus on higher-value activities (Nguyen et al., 2020). It also helps optimize workflows by identifying process inefficiencies and generating insights from large datasets to support strategic decision-making. Moreover, AI drives innovation by allowing financial institutions to create more personalized products and services tailored to individual needs. It also supports the emergence of new business models like embedded finance and digital financial planning, giving banks a competitive edge in the evolving market (Singh & Roy, 2023). Empirical studies found that consumers in the banking and financial services sector are generally well aware of AI applications, with the highest adoption in banking operations, followed by KYC/AML, chatbots, and security compliance (Geetha, 2021). AI-driven chatbots and virtual assistants enhance customer service by providing faster, personalized responses, leading to increased customer satisfaction (Zulfiqar et al., 2024) (Maseke, 2024). AI can personalize financial products, making them more accessible to underserved populations, particularly in rural areas of India. By improving creditworthiness assessments, AI helps banks extend services to those previously excluded from the financial system (Kumar & MANRAI, 2024). On the other hand, AI adoption in banking has its own issues and challenges and the need for staff training in AI tools persist (Zulfiqar et al., 2024) (Hussain et al., 2024). Key concerns include safeguarding customer data privacy, addressing algorithmic biases that could result in unfair outcomes, integrating AI with outdated legacy systems, and navigating the ethical implications of automation—particularly around transparency, accountability, and potential job displacement (Rahman & Silva, 2022). Ethical considerations surrounding AI implementation are crucial, as banks must balance technological advancements with customer trust and security (Maseke, 2024). Addressing these concerns is essential to ensure the responsible and sustainable use of AI in financial services. Based on the literatures, the following framework is established.

**Figure 1: Conceptual Framework**



### OBJECTIVES OF THE STUDY

- To examine the customer perception factors of Artificial Intelligence (AI) enabled services in the Indian banking sector.
- To examine customer satisfaction with AI-enabled banking services in the Indian private banking sector.
- To evaluate the influence of customer perception factors (perceived ease of use, usefulness, risk, and awareness) on customer satisfaction.
- To assess the impact of demographic factors on the perception and satisfaction of AI in banking.

### HYPOTHESIS

- There is no significant differences between educational level and the perception and satisfaction level of the customers.
- There is significant differences between educational level and the perception and satisfaction level of the customers.

### RESEARCH METHODOLOGY

The study is descriptive and adopts a survey methodology. The study is conducted among bank customers using purposive Sampling method. Data was collected both online and offline from 119 respondents both men and women, married and unmarried who holds account in private banks in India. The demographic of the population was 18 – 60 years of age. The questionnaire contains details about the demographic profile of the respondents and questions related to Customer perception and satisfaction towards AI adoption in banking services. To ensure validity, the study incorporated established and validated measurement scales for perception and satisfaction. These included constructs adapted from the Technology Acceptance Model (TAM) developed by Davis (1989), the SERVQUAL model by Parasuraman, Zeithaml, and Berry (1988), the Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh et al (2003), and the Customer Satisfaction (CSAT) scale developed by Millán and Esteban (2004). Items were modified so as to match with the objectives of the study of measuring AI-enabled Banking services. For example, SERVQUAL items were modified to measure the quality of AI-enabled services, while CSAT-related items were modified to evaluate customer satisfaction with regard to AI driven technologies. Further, secondary sources of data were utilized from internet sources, academic journals, books, and government websites in order to provide better data analysis.

### Data Analysis and Results

**Table 1: Reliability Analysis Results**

S.No	Construct	Items	Cronbach's Alpha
1	Perceived ease of use	3	0.706
2	Perceived usefulness	3	0.830
3	Technological knowledge	3	0.703
4	Perceived risk	3	0.756
5	Awareness	3	0.802
6	Customer satisfaction	4	0.787
7	Service quality	4	0.893

8	Overall Perception	15	0.799
9	Overall Satisfaction	8	0.846

Source: The authors

Table 1 presents the reliability analysis, assessing internal consistency through Cronbach's alpha coefficients. A construct with a Cronbach's alpha value of more than 0.70 is considered acceptable indicating good internal consistency among the items (Nunnally & Bernstein, 1994). The overall Perception construct demonstrated strong reliability with an alpha coefficient of  $\alpha = 0.799$  (perceived ease of use  $\alpha = .706$ , perceived usefulness  $\alpha = .830$ , technological knowledge  $\alpha = .703$  perceived risk  $\alpha = .756$ , Awareness about AI in Banking  $\alpha = .802$ ). Similarly, the Cronbach alpha coefficient for Satisfaction was  $\alpha = 0.846$  (customer satisfaction  $\alpha = .787$ , service quality  $\alpha = .893$ ). These results confirm that the scales used in this study are internally consistent and suitable for further analysis.

**Table 2: Demographic profile of the respondents (N = 119)**

Factors	Classification	Frequency	Percentage (%)
Gender	Male	33	28
	Female	86	72
Age	Under 25	37	31
	25 – 35	42	35
	36 – 45	15	13
	46 – 60	13	11
	Over 60	12	10
Educational Qualification	Below High School	10	8
	High School	28	24
	Bachelor’s Degree	70	59
	Post Graduate Degree	11	9
Occupation	Self Employed	14	12
	Salaried /Employed	55	46
	Retired	15	13
	Unemployed	35	29
Monthly Income	Less than 20000	51	43
	20,000 – 30,000	20	17
	30,001 – 40,000	10	9
	40,001 – 50,000	22	18
	More than 50,000	16	13
Frequency of using AI	Daily	4	3
	Weekly	17	14
	Monthly	32	28
	Rarely	56	47
	Never	10	8

Source: The authors

The above data (Table 2) summarizes the demographic profile of the respondents. There were 119 customers of private sector banks consisting of 72% female and 28% male respondents. About 64% of the respondents were married and 36% were single. As presented in the table 35 % of the respondents were between the age group of 25- 35 years and 31% were less than 25 years of age, 13% were between 36 - 45 years and 11% of the respondents were between 46 – 60 years of age and only 10% were above 60 years. Most of the respondents had Bachelor’s degree (59%) followed by High School (24%) and Post Graduate (9%) and below High School (8%). It is found that the majority of the respondents (46%) were salaried employees and 29% were unemployed followed by 13% retired and 12% self- employed. 43 % of the respondents belong to the income group of less than Rs.20,000, 18% between Rs.40,001 - 50,000, 17% between Rs.30,001 - 40,000. It is also found that around 47% of the respondents rarely use AI services, 28% monthly, 14 % weekly and 3% daily.

**Table 3: Model Summary, ANOVA, Coefficient values of Customer Perception and its influence on Customer Satisfaction in using AI**

Model								
Summary		ANOVA			Coefficient			
		R	R <sup>2</sup>	F	Sig	B	T	Sig
Customer Perception		0.701	0.492	228.858	0.000	0.701	15.128	0.000

**Table 4: Regression Analysis**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	19.354	1.75z4		11.025	.000
	Perception in using AI	.272	.018	.701	15.128	.000

**Source:** The authors

**Notes:** Dependent Variable: Customer Satisfaction

The prediction model presented above (Table 3) is statistically significant,  $F = 228.858$ ,  $p < .005$ , showed that perception is accounted for 49.2% variance in the customer satisfaction scores ( $R^2 = .492$ , Adjusted  $R^2 = .459$ ) suggesting a strong effect of customer perception on customer satisfaction. It is evident from regression analysis (Table 4) that customer perception predicted satisfaction level (7.01 per cent) indicates a moderately strong model fit. The findings indicate that improving the AI enabled services in banks would enhance the satisfaction level of the customers.

**Table 4: Analysis of Variance between Perception ,Satisfaction and Educational Qualification of Customers towards AI adoption in Banking Services**

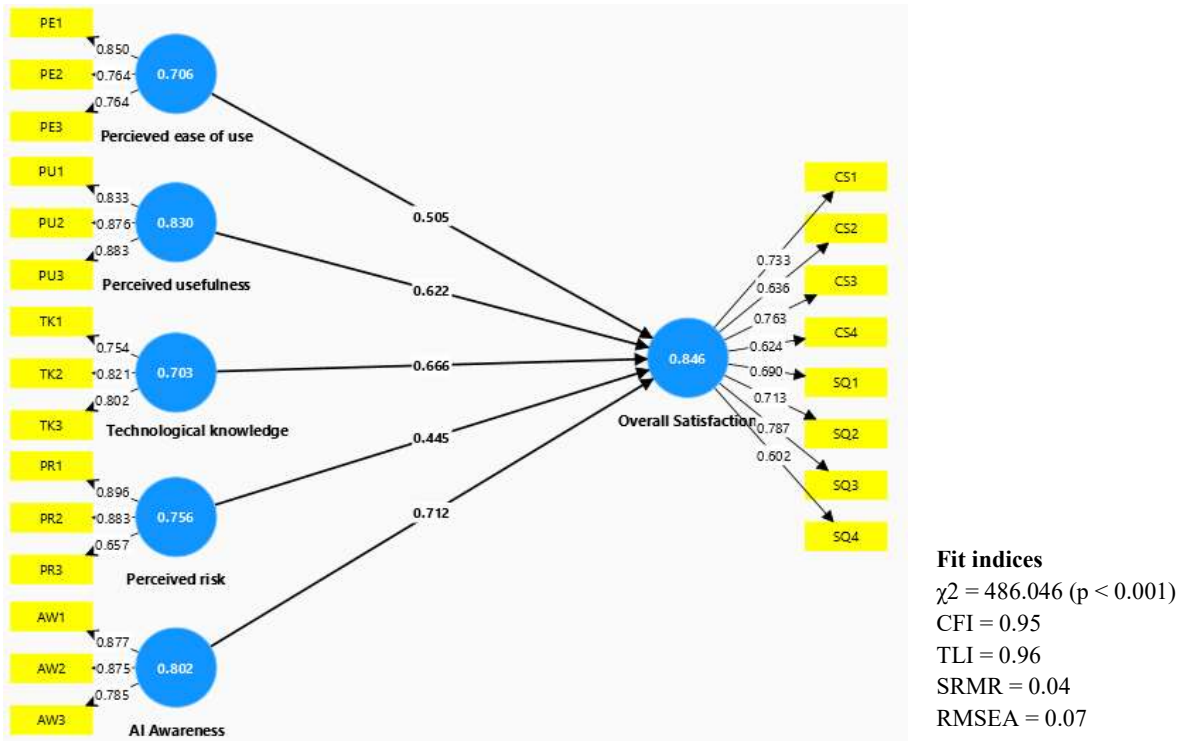
		Sum of Squares	Df	Mean Square	F	Sig.
Perception towards AI	Between Groups	64498.886	2	32249.443	62.913	.000
	Within Groups	114311.380	117	512.607		

	Total	178810.265	119			
Customer Satisfaction	Between Groups	1638.921	2	819.461	7.476	.001
	Within Groups	24443.061	117	109.610		
	Total	26081.982	119			

Source: The Authors

From the above analysis (Table 4), it is evident that there exists a statistically significant difference between educational qualification and the perception of customers towards the adoption of AI banking services as determined by one-way ANOVA ( $F(2,117) = 62.913, p = .000$ ) which is  $< 0.05$  significant level and there is a significant difference between educational qualification and satisfaction of the customers towards AI adoption as determined by one-way ANOVA ( $F(2,117) = 7.476, p = .001$ ) which is  $< 0.05$  significant level. The results show that customers with undergraduate and postgraduate education levels tend to have a higher perception and satisfaction with AI banking services compared to customers with only school-level education. To bridge this gap, banks should adopt simplified, inclusive, and trust-building approaches such as digital literacy training, simplified digital interface, in-person support and feedback so as to enhance understanding, trust, and overall satisfaction with AI banking.

Figure 2: Path Coefficients using SEM analysis



The path coefficients using PLS-SEM analysis (Figure 2) show that the model is statistically significant. The findings indicate that perceived ease of use ( $\beta = .505$ ), perceived usefulness ( $\beta = .622$ ), technological knowledge ( $\beta = .666$ ), perceived risk ( $\beta = .445$ ), Awareness about AI in Banking ( $\beta = .712$ ) have significantly positive impact on customer satisfaction in using AI enabled banking services. These results support the conceptual model, awareness and technological knowledge emerges as strong significant

factors impacting customer satisfaction. Therefore, it is evident that customer perception towards AI enabled banking services can significantly and positively predict customer satisfaction.

### Implications

The present study attempts to offer practical implications to the banking sector in India including other sectors towards the integration of AI in customer experience and satisfaction. The findings of the study reveals that customer perception factors play a vital role in shaping the AI-enabled customer experience and the banks should concentrate on enhancing the AI powered financial services featuring convenience in use, personalization, trust, customer loyalty, and customer satisfaction. Empirical studies evident that a well-perceived AI enabled services can lead to positive and personalized customer interactions and therefore, financial institutions need to concentrate on integrating AI solutions in alignment with customer expectations and preferences to foster satisfaction and loyalty (Singh & Singh, 2024). Also, periodic evaluation and assessments of the quality AI enabled service can help organizations monitor, modify and optimize their offerings, ensuring sustained customer satisfaction (Rahmania et al., 2023). It is observed from literatures that AI powered services in the financial sector improve the values of customer experience as AI algorithms can collect, process, and analyze customer behavior. This functionality of data analytics of AI services enables banks to better understand customer needs and preferences and provide services to meet their individual needs. Therefore, the current study highlights the importance of prioritizing the customer perception factors when delivering AI powered services in order to ensure efficient banking operations and effective customer experience. Leveraging AI's analytical capabilities and consistent refining of AI strategies in alignment with customer needs and expectations would help financial institutions offer smarter, faster, personalized and more secure services benefitting both customers and institutions.

### Conclusion

The emergence of AI-enabled banking services has led to the transformation of the traditional financial operations and services thereby providing enhanced operational efficiency, better customer experiences, promoting financial inclusion especially in India, where AI technologies are being integrated into various banking functions with the government initiatives like “Digital India”. The emerging Artificial Intelligence enabled banking services has increased customer expectation and satisfaction and hence, it is imperative for the banks to offer customized services such as personalized interactions, efficient operations, and strong cyber security frameworks. AI- supported tools like chatbots are used in banks to deliver 24/7 services with quicker customer responses, and detection of fraudulent activities that tends to improve the trust among the customers so as to provide convenience and user-friendly banking services. Adoption of AI enabled banking services enhance customer satisfaction thereby helps the banks to gain competitive advantage. In addition to the advantages, introduction of AI in banking also faces prominent threats and issues in relation with data handling, privacy and integrity of data being used and the ethical use of automation. Identifying the critical issues and addressing the needs of the customers through proper integration of AI enabled services will play a crucial role in gaining competitive advantage and trust that subsequently leads to the long-term sustainability and growth across the banking sector.

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