



IMPLEMENTATION OF ARTIFICIAL INTELLIGENCE IN BANKING SECTOR BASED ON COIMBATORE CITY

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Abstract:

Artificial Intelligence (AI) has emerged as a transformative technology in the banking sector, enabling financial institutions to enhance operational efficiency, customer service, risk management, fraud detection, and decision-making. The adoption of AI-based technologies, including chatbots, machine learning, robotic process automation, predictive analytics, and biometric authentication, is reshaping the delivery of banking services. This study focuses on the implementation of Artificial Intelligence in the banking sector, with special reference to Coimbatore City. Banks increasingly use AI to assess customers' financial profiles, provide digital assistance and financial guidance, detect fraudulent activities, and deliver personalized services. Although AI is being rapidly adopted across various industries, its effectiveness largely depends on customers' perceptions, acceptance, trust, and continued usage of AI-enabled banking services. The study also examines the perceptions of banking customers regarding the use of AI and its role in improving banking operations and services. For the purpose of the study, data were collected from 60 banking customers in Coimbatore City through a structured questionnaire. The collected data were analysed using appropriate statistical techniques to understand customers' views and experiences regarding AI-based banking services. The findings of the study are expected to provide useful insights for banking institutions in improving AI-enabled services and for policymakers and government authorities in understanding customer perceptions and promoting the effective adoption of Artificial Intelligence in the banking sector.

Key Words: Artificial Intelligence, Banking Sector, AI Adoption, Digital Banking, Customer Service, Financial Sector

Introduction:

Artificial Intelligence (AI) is revolutionizing various industries, and the banking sector is no exception. The integration of AI into banking processes is not only enhancing efficiency but also transforming customer experiences. Every industry is assessing its options and developing methods to deliver value in a technology-driven environment. The banking business is undergoing dramatic changes, the most significant of which is a rise in customer-centricity. Customers are constantly exposed to cutting-edge technologies; therefore banks must create seamless experiences. Banks have widened their industrial landscape to encompass retail, IT, and telecom for services such as mobile banking, e-banking, and real-time money transfers. Even while these developments have enabled customers to access the bulk of financial services whenever and wherever they choose, the banking industry must pay a price for them.

Objectives:

- To study the influence of Artificial Intelligence in the banking sector.
- To know the awareness of the AI among the people
- To know the Overall development and the potential of Artificial Intelligence in the Banking Sector.
- To examine the role of Artificial Intelligence in enhancing cyber security and fraud detection in the banking sector.

Statement of the Problem:

Artificial Intelligence (AI) has emerged as a transformative technology in the banking and financial services sector. Technologies such as machine learning, computer vision, and natural language processing are significantly changing the way banks deliver services, manage operations, and interact with customers. The adoption of AI can improve operational efficiency, enhance decision-making, strengthen cyber security, and contribute to substantial cost savings. Financial institutions are particularly well positioned to benefit from AI because of the large volume of data they generate and process. However, the effectiveness of AI in banking largely depends on the availability, quality, security, and proper management of data.

Scope of the Study:

Digital technology is transforming almost every industry by changing the way businesses operate and interact with customers. The banking sector has also witnessed significant digital growth, with services such as mobile banking, e-banking and real-time fund transfers becoming increasingly common. Today's technologically aware customers expect banking services to be convenient, fast, secure, and personalized.

Artificial Intelligence (AI) offers significant potential for meeting these changing customer expectations. Technologies such as machine learning, big data analytics, pattern recognition, and self-learning algorithms can help banks improve service quality, reduce operational costs, detect fraud, and enhance decision-making. With the growing adoption of digital banking in India, AI is expected to play an increasingly important role in the future of the banking sector.

Research Methodology:

A systematic research methodology is essential for effectively examining the research problem and ensuring the validity and reliability of the findings. The selection of an appropriate research method plays a significant role in achieving meaningful and accurate results. The present study follows a suitable methodology to analyse the objectives of the research. The data for the study has been collected from the respondents of the Coimbatore city.

Collection of Data:

Data collection is one of the most important aspects of the study. The data collected from both primary and secondary sources.

Primary Data:

The primary data those were collected questionnaire.

Secondary Data:

Books, lending materials, journals, and magazines available in the library were referred to by the faculty to gain a comprehensive understanding of the study and to obtain relevant information for the research.

Sampling Procedure and Size:

The study adopted a convenience sampling method, and data were collected from 60 respondents selected from Coimbatore city. The collected data were carefully edited, verified, and checked for reliability and consistency before being systematically presented in the master table for further analysis.

Statistical Analysis:

- Descriptive Analysis
- Chi - Square Test
- One way ANOVA

Review of Literature:

In Fountain et al. (2019), the author described the future research directions as "investigate motivation and barriers to organizational AI adoption and leadership tools to aid in adoption." and the research sub-theme was AI. The author recommended that this research investigate the different factors (e.g., the leader-strategy-ship role) impacting organizational adoption of AI technologies.

Kaur, J. (2020), The study highlighted the importance of implementing technological innovations in the Indian banking sector, where banking transactions form an integral part of everyday economic activities. Based on secondary sources of data, the study examined the three major phases of the evolution of the Indian banking sector, beginning with the history of banking and extending to nationalization and the banking reforms introduced after 1991. It also provided an overview of various innovative banking products and services, along with the development of electronic banking systems. The study concluded that technological innovations have significantly contributed to improving the productivity, efficiency, and quality of banking services, thereby acting as a catalyst for the transformation and modernization of the Indian banking sector.

A shatter (2023) notes AI's potential to revolutionize finance while identifying important challenges. The study highlights that AI applications range from improvements in customer service and fraud detection to risk management, credit assessments, and high frequency trading. However, these advantages come with concerns about compliance, model governance complexities, and the need for effective oversight.

Overview of the Study:

- Artificial intelligence (AI) is transforming the financial services industry in various ways, enhancing efficiency, accuracy, and customer satisfaction. In the Indian financial sector, AI adoption is rapidly evolving, with applications in predictive analytics, fraud detection, customer service, and personalized financial advice. AI powered predictive analytics helps financial institutions anticipate risks, identify opportunities, and make informed decisions.
- The technology is also being used to improve customer experiences through chat bots and virtual assistants, providing 24/7 support and freeing human agents to focus on complex issues. Additionally, AI-driven systems detect and prevent fraudulent activities in real time, reducing false positives and improving detection accuracy. Personalized financial recommendations are another key area where AI is making an impact, enabling tailored financial products and services that increase customer satisfaction and loyalty

Analysis and Interpretation:

Factors		No of Respondents	Percentage (%)
Gender	Male	33	55
	Female	27	45
Age	18-25Years	18	30
	26-35Years	21	35
	36-45Years	13	21.7
	45-60Years	6	10
Marital Status	Married	28	46.7
	Unmarried	32	53.3
Educational Qualifications	School Level	8	13.3
	Diploma/Certificate	4	6.7
	Under graduate	30	50.1
	Post graduate	11	18.3
Occupation Status	Profession	7	11.6
	Student	15	25
	Govt. Employee	8	13

	Business	14	23
	Private Employee	18	30
	Retired Person	1	1.7
	Home Maker	4	6.7
Income Status	Below Rs 20000	15	25
	Rs 21000-Rs30000	16	26.7
	Rs31000-Rs40000	11	18.3
	Rs41000-Rs50000	7	11.7
	Above Rs 50000	11	18.3
Operating Accounts in Bank	Private bank	30	50
	Public bank	17	28.3
	Both	13	21.7
Types of Accounts	Savings A/C	45	75
	Current A/C	12	20
	Recurring Deposit A/C	3	5
Visiting of Banks	Weekly	5	8
	Fortnightly	6	10
	Monthly	33	55
	Rarely	16	27
Satisfaction Level of AI in Banking Sector	Yes	54	90
	No	6	10

Chi Square Analysis:

Chi - Square is a statistical tool commonly used for testing the independence and goodness of fit. Table showing the Comparison between Income and Awareness for the Factors of AI Technology

- H0: There is no significant association between income and awareness factors of AI Technology.
- H1: There is significant association between income and awareness factors of AI Technology

Chi-Square Tests:

Variable / Statement	Value	df	Asymptotic Significance (2-sided)
Big Data Interpretation	17.348	16	0.363
Chatbots	11.581	16	0.772
Banking Apps	8.327	8	0.402
Biometric Withdrawal System	10.544	16	0.837
AI-Enhanced System	15.638	16	0.479
Forward and Backward Thinking	25.715	16	0.058
Business Intelligence	30.263	16	0.017
Machine Learning	11.802	12	0.462
Instant Feedback on Service Quality	18.896	12	0.091
Fraud Detection	16.369	16	0.428
Generation of Personalized Portfolio Statement for Customers	19.126	16	0.262
Digitalization of KYC Process	21.681	16	0.154
Financial Advisory Services	25.367	16	0.064
Digital Lending	30.35	16	0.016
Alarm System	12.65	16	0.698
Robotic Process Automation	12.592	16	0.702

Interpretation:

In this table, the p-values of the factors of awareness are greater than the significance level of 0.05. Therefore, the null hypothesis is accepted. It can be concluded that there is no significant association between income and the awareness factors of AI technology. However, the p-values for the factors of Business Intelligence and Digital Lending are less than the significance level of 0.05. Therefore, the null hypothesis is rejected. It can be concluded that there is a significant association between income and the factors of Business Intelligence and Digital Lending.

Table Showing the Comparison Between Gender and Satisfaction Level for the Factors of AI Technology:

- H0: There is no significant association between gender and satisfaction level for the factors of AI technology.
- H1: There is a significant association between gender and satisfaction level for the factors of AI technology.

Chi-Square Tests:

Factors of AI Technology	Value	df	Asymptotic Significance (2-sided)
Big Data Interpretation	1.518	4	0.823
Chatbots	6.076	4	0.137
Banking Apps	4.852	2	0.088
Biometric Withdrawal System	3.654	4	0.455
Enhanced System	3.105	4	0.54

Forward and Backward Thinking	5.027	4	0.285
Business Intelligence	5.14	4	0.273
Machine Learning	2.083	3	0.555
Instant Feedback on Service Quality	2.721	4	0.606
Fraud Detection	4.31	4	0.366
Generation of Personalized Portfolio Statement for Customers	3.794	4	0.435
Digitalization of KYC Process	1.691	4	0.792
Financial Advisory Services	2.676	4	0.613
Digital Lending	3.632	4	0.458
Alarm System	2.336	4	0.674
Robotic Process Automation	2.652	4	0.618

Interpretation:

In this table, the p-values for the factors of satisfaction are greater than the significance level of 0.05. Therefore, the null hypothesis is accepted. It can be concluded that there is no significant association between gender and satisfaction level for the factors of AI technology. Correlation is the study of the linear relationship between two variables. When there is a relationship between two sets of quantitative variables, the appropriate statistical tool for measuring and expressing the strength and direction of the relationship between them is known as correlation.

One-Way ANOVA:

One-way ANOVA is used to examine whether variations or different levels of a single independent variable, or factor, have a statistically significant effect on a dependent variable. ANOVA is frequently used to determine whether there are significant differences between the means of different groups.

Relationship Between Gender of the Respondents and Factors of AI Technology:

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	0.46	3	0.153	0.597	0.62
Within Groups	14.39	56	0.257	—	—
Total	14.85	59	—	—	—

Interpretation:

This table shows the relationship between the gender of the respondents and the factors of AI technology. The calculated p-values for most of the factors of AI technology are greater than the significance level of 0.05. Therefore, the null hypothesis is accepted. It can be concluded that there is no significant relationship between the gender of the respondents and the factors of AI technology.

Findings:

Descriptive Analysis:

- The majority, 33 (55%), of the respondents are male.
- Most, 21 (35%), of the respondents belong to the age group of 26–35 years.
- The majority, 32 (53.3%), of the respondents are unmarried.
- The majority, 35 (50.1%), of the respondents are undergraduates.
- Most, 18 (30%), of the respondents are salaried persons.
- Most, 16 (26.7%), of the respondents earn between Rs. 21,000 and Rs. 30,000.
- The majority, 30 (50%), of the respondents operate their accounts with private banks.
- The majority, 45 (75%), of the respondents have savings accounts.
- Most, 23 (38%), of the respondents are more aware of banking apps.
- All 60 (100%) of the respondents are satisfied with AI technology.

Chi-Square Analysis:

- There is no significant association between the income of the respondents and the awareness factors of AI technology.
- There is a significant association between income and the factors of Business Intelligence and Digital Lending.
- There is no significant association between gender and satisfaction level for the factors of AI technology.

One-Way ANOVA:

There is no significant relationship between the gender of the respondents and the selected factors of AI technology. The factors specifically considered for the analysis are Chatbots, Banking Apps, Biometric Withdrawal System, Machine Learning, and Fraud Detection.

Suggestions:

- Artificial Intelligence (AI) is an emerging technology with the potential to transform the banking sector. The implementation of AI can help banks improve operational efficiency, customer service, fraud detection, and decision-making. This study focuses on the implementation of AI technology in the banking sector in Coimbatore City and examines the benefits, challenges, and impact of AI adoption on banking operations and customer services.
- Banks must ensure that their customer service remains competitive in the current scenario. The use of AI technology can help improve customer service, provided that adequate attention is given to security. Therefore, banks should place greater emphasis on security measures to retain customers and improve the quality of their services.
- Banks may consider reducing additional charges associated with digital banking services supported by AI technology. Information technology is not an end in itself but a useful tool that enables the banking industry to improve efficiency and service delivery. Banks should also ensure that AI-enabled banking services are easy for customers to understand, access, and use.

Conclusion:

Artificial Intelligence (AI) has significant potential to improve the banking sector. It enables banks to process large amounts of data quickly and use the resulting information for better decision-making. AI-based technologies such as chatbots, digital payment systems, and biometric fraud detection can improve customer service and security. AI can also help banks reduce costs, increase operational efficiency, provide personalized services, detect fraud, assess creditworthiness, and comply with regulatory requirements. Overall, the effective implementation of AI can enhance banking operations and provide faster, safer, and more convenient services to customers.

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