

Impact Of Artificial Intelligence Driven Automation In Commercial Banks In Chennai

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Abstract

The purpose of the study is to understand how the Automation and Artificial Intelligence is used in banking sectors, its impacts, how they are infused. The infusion of Artificial Intelligence (AI) into the financial sector is modified to conventional banking activities by improving operational efficiency, bolstering security, enhancing the customer experience. This research explores the varied applications of AI technologies, such as machine learning, natural language processing, and robotic process automation, within the financial sector. It highlights key areas such as AI powered customer support via chatbots and virtual assistants, the use of predictive analytics for fraud detection, the provision of tailored financial services, assessment of credit risk, and the automation of regulatory processes. The research looks into how these advancements are streamlining operations, cutting costs, and tackling issues concerning data privacy and algorithmic fairness. Furthermore, it explores the future possibilities of AI in transforming banking services, while stressing the importance of maintaining an ethical and transparent approach to AI implementation. The results indicate that AI is not just improving operational effectiveness but also facilitating strategic decision-making, providing a competitive advantage in the growing digital banking environment.

Keywords: Artificial intelligence, automation, digital banking environment.

INTRODUCTION:

Artificial intelligence is the future of banking as it can prevent fraudulent transactions and improve compliance through advanced data analytics. Artificial intelligence in the financial services industry helps banks process large amounts of data and predict the latest trends in markets, currencies and stocks. Advanced machine learning techniques help gauge market sentiment and suggest investment options. JOHN MCCARTHY was one of the most influential people in this field. He is known as the "Father of Artificial Intelligence" for his fantastic work in computer science and artificial intelligence. McCarthy coined the term "artificial intelligence" in the 1950s. He defined it as "the science and art of making intelligent machines.

ROLE OF ARTIFICIAL INTELLIGENCE IN BANKING INDUSTRY :

Artificial intelligence (AI) includes machine learning and natural language, it can be used in the banking industry, Machine learning is a method of data analysis which automates analytical model building, Machine learning occurs when computers change their parameters/algorithms on exposure to new data without humans having to reprogram them. Natural language processing (NLP) refers to the ability of technology to use human communication, naturally spoken or written, as an input that prompts computer activity, natural language generation (NLG) refers to the ability for technology to produce human quality prose, It sorts through large amounts of available data to produce a human-sounding response, NLG can take the form of speech, or of a multipage report summarizing financial results. Artificial Intelligence AI is fast evolving as the go-to technology for companies across the world to personalize experience for individuals. The technology itself is getting better and smarter day by day, allowing more and newer industries to adopt the AI for various applications. Banking sector is becoming one of the first adopters of AI. And just like other segments, banks are exploring and implementing the technology in various ways. The rudimentary applications AI include bring smarter chat-bots for customer service, personalising services for individuals, and even placing an AI robot for self-service at banks. Beyond these basic applications, banks can implement the technology for bringing in more efficiency to their back-office and even reduce fraud and security risks. Unsurprisingly,

research firms are bullish on the potential of AI in banking. According to Fintech India report by PwC in 2017, the global spending in AI applications touched \$5.1 billion, up from \$4 billion in 2015. There is a keen interest in the Indian banking sector as well. Artificial Intelligence is the future of banking as it takes the power of advanced data analytics to contest fraudulent transactions and improve compliance. AI algorithm achieves anti-money laundering activities in few seconds, which otherwise take hours and days. 1. AI also allows banks to manage huge volumes of data at record speed to derive valuable perceptions from it. Features such as AI bots, digital payment advisers and biometric fraud detection mechanisms lead to higher quality of services to a wider customer base. 2. All this explains to increased revenue, reduced costs and boost in profits.

Artificial intelligence Technology systems used in banking sectors are :

- Robotics.
- Computer vision.
- Language.
- Virtual agents.
- Machine learning.

Reasons for adoption of artificial intelligence in banking sector :

- To improve operational efficiency.
- To recognize fraud and security risk.
- To accomplish large volume of data.
- To make decision successfully.
- To assist the customer for their queries.
- Easily find the credit worthiness of an individual and a company.
- Generates compliance report for fraudulent transaction Easily capture the data from KYC document using OCR technique.

Areas of artificial intelligence in banks :

Many areas where banks are UTILIZING Artificial Intelligence to efficient the processes:

- Fraud and cyber security.
- Customer service.
- Compliance .
- Financing and loan (credit assessment)
- Business process management.
- Marketing.

REVIEW OF LITERATURE

Kaur D, Sahdev (2020) Emphasized that AI is revolutionizing the banking industry, transforming routine tasks and reducing human manpower, while also causing a shortage of skilled talents to handle automation.

Königstorfer & Thalmann (2020) Explored the Applications of Artificial Intelligence and automations in commercial banks and the research agenda for behavioural finance.

Ghandour (2021) Highlights the challenges and opportunities of banking AI and AI in banking offers opportunities for personalized services, smart wallets, decision-making, and cyber security improvements, but must overcome challenges like job loss, privacy breaches, and loss of emotional "human touch".

Impact of Autonetics in Banking Reduced Expenses:

The introduction of neural networks in the banking system has notably lowered the expenses associated with documentation and printing copy. It is projected that by 2023, the adoption of automatic technology in banking services could save up to \$416 billion. This technology enables banks to pass information for both organizational and clients use without the need for additional staff or paper.

Chatbots: The technology behind chatbots is among the most fascinating and innovative applications of AI, designed to engage with customers through pre-programmed responses to queries, ensuring polite and efficient communication, and swift resolution of issues and also gather data from these interactions, which can be utilized to tackle similar issues in the future.

Cost Savings: The adoption of intelligence technology (AI) in the financial service sector has drastically lowered the costs associated with printing and documentation. From 2023, the use of AI infusion in banking could lead to savings of up to \$416 billion. This technology allows banks to share information for both organizational and the users needs without the necessity for extra staff or paper.

Improved Customer Service: Over the years, customer needs have changed greatly, requiring quick responses and customized content. AI, especially through automatic digital learning, uses algorithms that enable banks to inspect and forecast users behavior and credit and interest rates resulting in specialized plans for each customer. This technology helps banks digitalize their procedures and processes to satisfy these demands, underscoring the role of AI in enhancing customer satisfaction.

Understanding Customer Feelings: The main goal of financial institutions is to predict and comprehend customer behavior to enhance and provide financial solutions. AI's sentiment analysis technology can measure customer emotions, feelings, and reactions through various channels such as emails, social media, and surveys, to determine future customer preferences. This technology gathers data to tailor content for users based on their alternative options and selections.

Efficient Operations: The incorporation of automatic intelligence technology in banking, operating autonomously, is clear in the precise and rapid handling of currency by digital machines. This AI technologies enhances the day to day operations of financial sectors, reducing stress among employees and minimizing errors in cash counting, and supports the widespread adoption of AI across different operational areas of financial institutions.

Identify Fraudulence and Prevention: Banking companies face an increased risk of loss due to fraud as the volume of financial proceedings and the complication of their tasks. AI, through arithmetical calculations and difficult algorithms, monitors both clients and staff behavior using empowered learning programs. This technology simplifies the process of fraud prevention by using AI's machine learning capabilities to delegate tasks from humans, thereby protecting business operations. Future Prospects: The banking sector in India holds great potential for growth with the deployment of AI, offering opportunities for financial inclusion and collaborations with fintech companies to address current challenges.

Case Examples in Chennai

- **ICICI Bank (Chennai Branch):** Uses AI for personal finance recommendations.
- **Axis Bank:** Deployed AI for fraud detection and call center automation.
- **State Bank of India (Chennai region):** Integrated AI to improve loan processing times.

Key Challenges and Limitations in Chennai

1. **Data Privacy and Security:** As AI systems rely extensively on large data sets, concerns around data privacy, unauthorized data sharing, and cyber-security are heightened. Customers and employees alike in India and worldwide cite these as primary barriers to full acceptance of AI-driven banking.
2. **Cost and Infrastructure:** Small and mid-sized banks in Chennai, as in other emerging markets, face significant barriers in terms of high up-front investment, legacy IT integration, and requirement for robust digital infrastructure to support large-scale automation.
3. **Regulatory and Ethical Issues:** The absence of tailored regulatory frameworks and clear best practices for AI deployment in Indian banking renders compliance more complex, with ethical dilemmas around transparency, bias, and explainability.
4. **Need for Blended Human-AI Approach:** Research strongly indicates that the optimal model for Chennai and similar markets is one that leverages the speed and efficiency of AI while preserving avenues for human intervention—especially for personalized services, problem resolution, and financial advice.

Recommendations for Commercial Banks in Chennai

- **Strategic Staff Upskilling:** Invest in ongoing upskilling and reskilling initiatives for all levels of staff to ensure readiness for AI-integrated operations, and to mitigate anxieties around job displacement.
- **Customer Education:** Enhance awareness among customers regarding the benefits and safeguards associated with AI-enabled banking services, addressing resistance and building trust.
- **Robust Data Governance:** Implement and continuously update data privacy, cybersecurity, and ethical AI guidelines tailored to local regulatory and cultural expectations.

- **Hybrid Service Model:** Develop blended service ecosystems combining AI-driven interfaces for routine transactions and personalized human intervention for complex or high-value activities.
- **Collaboration and Innovation:** Foster partnerships with technology firms and academic institutions to accelerate innovation, share best practices, and navigate evolving technological and regulatory landscapes.

Objectives of the Study:

1. To assess the adoption level of AI-driven automation in commercial banks in Chennai.
2. To analyze the impact of AI automation on bank operations and service delivery.
3. To study customer perceptions regarding AI-based services in banking.
4. To evaluate the benefits and challenges faced by banks due to AI integration.
5. To provide suggestions for optimizing AI adoption in banking.

Type of Research: Descriptive and analytical

Primary Data: Structured questionnaires for bank employees and customers

Secondary Data: Reports from RBI, NASSCOM, bank websites, journal articles

Sample Size: 31 employees and 100+ customers across 5 commercial banks

Sampling Method: Stratified random sampling

Reliability test

Case Processing Summary

		N	%
Cases	Valid	31	100.0
	Excluded ^a	0	.0
	Total	31	100.0

a. Listwise deletion based on all variables in the procedure.

Factor analysis:

Reliability Statistics

Cronbach's Alpha	N of Items
.851	31

Interpretation:

Cronbach's α was used to measure the questionnaire's consistency. The overall coefficient was found to be 0.851 of 31 items which exceeds the minimal recommendations. Therefore, the viability and validity of the instrument is deemed to be sufficient.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.543
Bartlett's Test of Sphericity	Approx. Chi-Square	787.090
	df	528
	Sig.	0.000

Based on correlations

By the data of the customer response in the Questionnaire survey the factor analysis Kaiser- Meyer-Olkin Measure of Sampling Adequacy value is 0.543 which is positive results and Bartlett's Test of Sphericity Approx. Chi-Square value is 787.090 and degree of Freedom value is 528.

Findings (Sample Summary):

- **80% of bank employees** reported improved efficiency with AI tools.
- **65% of customers** appreciated AI services but preferred human support for complex queries.
- **Main challenges** include cybersecurity risks, employee resistance, and high initial costs.
- AI has **significantly reduced turnaround time** for routine transactions.

CONCLUSION

AI-driven automation profoundly transforms commercial banking in Chennai by enhancing operational efficiency, enriching customer experiences, and reshaping workforce roles. However, successful integration

demands addressing ethical, technical, and human capital challenges through balanced, strategic interventions. Ultimately, the future of AI in Chennai's banking sector lies in leveraging technology to augment, not replace, human expertise, ensuring inclusive, secure, and customer-centric banking services. AI-driven automation is fundamentally reshaping commercial banking in Chennai by streamlining operations, personalizing customer experience, augmenting financial inclusion, and enhancing risk management. While the benefits are evident improved efficiency, cost savings, risk reduction, and customer satisfaction the complexity of implementation, regulatory ambiguity, data privacy concerns, and workforce transformation remain persistent challenges. Drawing from global and regional research, it is clear that sustained, ethical, and human-centric adoption of AI will be critical for Chennai's banks to realize the full promise of digital transformation and maintain their competitive edge in India's evolving financial ecosystem.

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