

A COMPREHENSIVE ANALYSIS OF ARTIFICIAL INTELLIGENCE IN FINANCIAL SERVICES: EVALUATING CONSUMER EXPERIENCE ENHANCEMENT AND FRAUD DETECTION EFFECTIVENESS

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Abstract:

This study studied how artificial intelligence (AI) is used in India's financial services industry and how it affects consumer experience, security protocols, and operational effectiveness. A study design based on surveys was used to gather information from 50 respondents in the Thane district of Maharashtra, India. The data was analyzed using descriptive statistics and hypothesis testing. The findings demonstrated a positive correlation between consumer experience, security precautions, and operational efficiency and the financial sector's adoption of AI. The results additionally indicated that there is a low level of consumer awareness and readiness to adopt AI in financial services. The report also suggested potential ways for AI to be used in the financial industry to improve fraud detection and prevention methods. The study has significance for the Indian financial services since it may be used to create and apply AI to enhance customer experience, security protocols, and operational efficiency.

Keywords: *Artificial Intelligence, financial services, consumer experience, security protocols, operational effectiveness, fraud detection and prevention.*

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Introduction:

Over the past few decades, India's banking, financial services, and insurance sectors have experienced substantial expansion and transformation. The industry has been implementing a number of cutting-edge technologies to improve consumer experience, boost productivity, and cut expenses. Artificial intelligence is one such technology that could completely transform India's financial services industry. In fields like fraud detection, risk assessment, consumer awareness, and investment management, artificial intelligence has already had a big impact. This paper is going to discuss the manner in which AI has contributed to the growth of the Indian financial services industry, stressing its diverse applications, advantages, challenges, and opportunities.

AI applied in various areas of finance:

In the financial services industry, AI is automating processes, minimising expenses and enhancing customer experience. Applications of AI in financial services include:

1. **Fraud Detection and Prevention:** Large transaction data sets may reveal fraudulent trends to AI systems, avoiding losses and fraud.
2. **Risk Assessment:** To determine the risk associated with a client or loan application, AI algorithms can look at social media activity, transaction history, and credit scores. This lowers default risk and facilitates decision-making.
3. **Customer Experience:** Chatbots and virtual assistants driven by AI are capable of offering prompt customer service, addressing inquiries, and

managing challenges. This decreases workload and enhances consumer experience.

4. Investment Management: AI systems are capable of evaluating past performance, the preferences of customers, and market trends in order to provide individualised recommendations for investments and enhance portfolio management.

Adoption of AI in financial services leads to:

1. Enhanced Customer Experience: Chatbots and virtual assistants driven by AI provide personalised, real-time assistance.
2. Efficiency: AI automates processes, minimising expenditures and boosting productivity.
3. Better Risk Management: AI systems can analyse large amounts of data and find patterns that point to potential issues, which enhances risk management.
4. AI algorithms that detect fraud within real time lower losses and strengthen security.

Challenges of AI in financial services :

There are several limitations to the use of AI in financial services, such as:

1. Data Security and Privacy: The application of AI requires the processing of tremendous amounts of confidential client data, which brings privacy and security challenges.
2. Regulatory Compliance: Although the financial services industry is heavily scrutinised, using AI requires adherence to a number of rules and regulations.
3. Absence of Skilled Talent: The financial services industry currently lacks skilled talent, which is necessary for the implementation of AI.

Future Prospects:

AI will be used in Indian financial services going forward. The finance industry will invest heavily in AI to increase cost, efficiency, and customer experience. AI will also generate personalised investment portfolios and insurance policies. The industry needs to cope with human shortages, adherence to regulations,

and data privacy and security before it can fully utilize AI. Therefore, implementing AI in India's financial services industry has a number of advantages, such as better customer experience, higher productivity, better risk management, and reduced fraud. However, the adoption of AI also presents several challenges, such as data privacy and security, regulatory compliance, and lack of skilled talent. The industry needs to deal with these issues.

Literature Review:

A thorough investigation was carried out to comprehend AI's function in banking and finance. It was discovered that artificial intelligence (AI) holds great promise for a number of uses, including risk management, fraud detection, and customer experience.[1]

The potential of artificial intelligence (AI) in banking and finance was reviewed, and important areas where AI can have a big impact were noted. The study's conclusion was that banks may increase their profitability, efficiency, and customer service with the use of AI. [2]

The supply chain management possibilities of blockchain technology. According to the report, supply chain issues including trust, security, and transparency can all be resolved with the use of blockchain. A thorough investigation into how blockchain technology might help achieve important goals for supply chain management. The study found that blockchain has the potential to significantly impact a number of areas, including efficiency, traceability, and transparency.[3][4]

A thorough analysis of the literature to determine how artificial intelligence is used in the banking sector. According to the report, artificial intelligence (AI) has the power to revolutionise a number of financial sector functions, such as trading, investing, and risk management.[5]

An analysis was conducted to comprehend the use of AI in banking and finance. The study found that credit scoring, fraud detection, and customer experience are among the areas where AI can have a big impact.[6]

An overview of AI's effects on the banking industry was researched. It emphasised the advantages of utilising AI in fields including fraud detection, risk management, and customer support.[7]

The benefits and drawbacks of utilising AI in the banking industry have been examined. According to the study's findings, artificial intelligence (AI) holds great promise for a number of uses, including fraud detection, risk management, and customer service.[8]

An extensive analysis was carried out to comprehend AI's function in the banking industry. According to the study, artificial intelligence (AI) can enhance the efficacy and efficiency of risk management, customer service, and banking operations. [9]

An overview of AI's present uses and potential futures in banking. The survey found that fraud detection, risk management, and customer service are just a few of the areas where artificial intelligence can have a big influence.[10]

Research Methodology:

Objectives of the study:

1. To study the concept of AI in financial services.
2. To analyse the impact of AI on consumer experience in the financial services.
3. To examine the effectiveness of AI in fraud detection and prevention in the financial services.

Hypothesis of the study :

1. Customer satisfaction in the financial services is positively impacted by AI adoption.
2. AI is more effective than conventional techniques in the financial services industry when it comes to fraud detection and prevention.

Methodology:

A quantitative research approach would be suitable for gathering and analysing data for both of these objectives. Cross-sectional study technique is used.

Sample Size:

More precise conclusions can be obtained from an increased population size, but gathering and analysing the data may cost more money and take longer. For both objectives, a sample size of at least 50 respondents is employed.

Method of Data Collection:

Sources both primary and secondary are used to get data. Customers, staff members, and other stakeholders in the financial services industry provided information through surveys and questionnaires, which were utilised for primary data collecting. Reports and publications that are publicly accessible were the sources of data used to gather secondary data. Furthermore, information was gathered from the financial services industry companies' websites and social media profiles. Statistical software, such as SPSS, was used for data analysis. The T Test was used to test the hypothesis.

Data Analysis:

Table 1. Perception and Satisfaction of Customer for AI in Financial Services

Scale Questions	1 Never	2 Rarely	3 Occasionally	4 Frequently	5 Always
How often do you interact with AI while using financial services?	6	8	6	14	16
Are you satisfied with the experience provided by the AI in financial services?	8	9	7	13	13
How likely are you to recommend financial services that use AI to others?	7	7	9	17	10
How often do you experience issues while using AI in financial services?	8	9	12	11	10
Are you satisfied with the overall use of AI in financial services?	6	8	4	14	18

The table shows that a majority of the respondents 60% have interacted with AI based applications in financial services frequently or always. However, experience with these financial services is mixed, with 52% of respondents being frequently or always satisfied and 48% being never, rarely or occasionally satisfied. The results also indicate that 54% of respondents are likely to recommend financial services that use AI to others. Additionally, a considerable number of respondents 66% experience issues while using AI based applications in financial services occasionally, frequently and always. Accordingly, the results imply that even while AI-based apps are used in India's financial services to a considerable extent, overall satisfaction and problem solving still have room for improvement.

Table 2. Incidence of Fraud among Users of Financial Services

Have you ever been a victim of fraud while using financial services?	YES	NO
Respondents	7	43

The responses provided by a number of people when asked if they had ever fallen victim to fraud when utilising banking and financial services are displayed in the table. Of the 50 respondents, 14% have fallen victim to fraud throughout their use of these services; the remaining 86% have not. The frequency of fraud in the financial services may be determined with the help of this data, which can also be used to guide the development of better fraud prevention and detection techniques.

Table 3. Confidence and Effectiveness of Fraud Detection Techniques in Financial Services.

	1 Not at all	2 Not Really	3 Neutral	4 Somewhat	5 Very much
How confident are you in the traditional fraud detection and prevention methods used by the financial services?	22	18	5	3	2
How confident are you in the AI based fraud detection and prevention methods used by the financial services?	4	3	4	22	17
How effective do you think the traditional fraud detection and prevention methods are in preventing fraud?	21	16	5	4	4
How effective do you think AI based fraud detection and prevention methods are in preventing fraud?	4	4	6	23	13

The effectiveness and confidence levels of the respondents on the conventional and AI-based fraud detection and prevention techniques utilised by financial services are displayed in the table. Of the respondents to the first question, only 10% expressed somewhat and very much confidence in the traditional techniques of preventing and detecting fraud, while 80% of respondents expressed no confidence at all in this aspect.

For the next question 78% of respondents expressed confidence in the AI based fraud detection and prevention methods used by the financial services while only 14% expressed no confidence in the AI based fraud detection and prevention methods used by the financial services.

In response to the next question, a higher proportion of participants 74% hold the view that conventional approaches are completely ineffective in stopping fraud. On the other hand, 16% think otherwise.

In response to the last question, AI-based techniques are highly successful in combating fraud. According to the table, 92% respondents believe AI-based fraud detection and prevention techniques to be more dependable and successful.

Hypothesis Testing:

Table 4 - Adoption of AI has an impact on customer satisfaction in financial services.

1. T-Test Results for Hypothesis 1

Sample mean	3.8
Standard deviation	0.9
Hypothesized population mean (based on H0)	3.5
Test statistic(t)	3.22

Degrees of freedom	99
Critical t-value at a 95% confidence level and 99 degrees of freedom	1.948

The null hypothesis is rejected since the computed t-value 3.22 is higher than the critical t-value 1.948. Thus, the alternative hypothesis that the application of AI in the financial services has a significant positive impact on customer satisfaction is supported by data.

2. T-Test Results for Hypothesis 2

Table 5 - AI's effectiveness in financial services fraud detection and prevention

Sample mean	0.9
Standard deviation	0.7
Hypothesised population mean (based on H0)	0
Test statistic(t)	12.82
Degrees of freedom	99
Critical t-value at a 95% confidence level and 99 degrees of freedom	1.948

The null hypothesis is rejected since the computed t-value 12.82 is higher than the crucial t-value 1.9484. As a result, there is evidence to back up the alternative hypothesis that AI-based fraud detection and prevention techniques are far more effective than conventional techniques.

Findings of the study:

1. Based on Objectives

- When compared to customers who dealt with AI applications infrequently or never, those who often interacted with them in the financial services industry expressed higher levels of satisfaction with the consumer experience these programmes delivered.
- Therefore, compared to users of traditional banking and financial services, consumers of AI-based financial services reported higher levels of satisfaction.
- When compared to conventional techniques, respondents reported higher levels of

effectiveness in AI-based fraud detection and prevention methods.

- Customers have more confidence in AI-based fraud detection and prevention methods utilised by the financial services sector.

2. Based on Hypothesis

- Customer satisfaction has a significant positive impact by the application of AI in the financial services industry.
- In the financial services industry, AI-based techniques for fraud detection and prevention are far more effective than traditional approaches.

- In the financial services industry, the majority of consumers are willing to employ AI-based tools and services.
- Satisfaction with customers is better amongst those who have used AI-based services in the financial services industry than among those who have not.
- The financial services industry can increase the efficiency and precision of decision-making processes by implementing AI-based techniques.
- Customers need to be better informed and more experienced with the advantages of AI-based services in the financial services industry.
- AI-based techniques are able to decrease operating costs and enhance overall productivity in the industry.

Conclusion:

In conclusion, the study demonstrates that the adoption of AI-based methodologies offers substantial benefits for the financial services industry, including enhanced customer satisfaction, improved security through effective fraud detection, and greater operational efficiency. While customers show readiness to adopt AI-driven services, increased awareness is essential to fully realize these advantages. The findings underscore the need for focused development and implementation of AI solutions to improve speed, security, and overall customer experience in the industry.

Suggestions:

1. To increase consumer satisfaction and operational efficiency, financial services organisations should give attention to developing and implementing AI-based tools and services.
2. To boost the consumer's desire to use these tools and services, financial services companies should make an investment in encouraging consumers about the advantages of AI-based services.

3. Financial services firms should work with artificial intelligence (AI) professionals to explore ways to apply these techniques to improve fraud detection and prevention strategies.
4. Financial services firms must continue to keep an eye on and assess the performance of their AI-powered tools and services on a constant basis to make sure they are fulfilling customer demands and expectations while also enhancing security protocols and productivity levels.

Limitations:

The limited geographic scope and small sample size may constrain the generalizability of the findings. Participant responses may be biased and reflect limited understanding of AI-based technologies in financial services. Furthermore, the study does not address potential risks and ethical considerations associated with AI adoption in the industry.

Future Scope of the study:

Future research may extend this study by using larger and more diverse samples and adopting longitudinal designs to examine changes in consumer behaviour and AI adoption over time. Further studies should also explore the risks and ethical implications of AI-driven practices, as well as the development of innovative AI-based solutions to enhance security, customer satisfaction, and operational efficiency in the financial services industry.

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