

A Study of AI in Finance

-Dr. **Pratiksha Mishra** - Associate Professor, Amity Business School, Amity University, Raipur, Chhattisgarh. Email- pmishra1@rpr.amity.edu

-Abhijeet Sinha , Student, Amity Business School, Amity University, Raipur, Chhattisgarh. Emailabhijeetsinha911@gamil.com

ABSTRACT: -

Artificial Intelligence (AI) has emerged as one of the most transformative technologies in the financial sector, reshaping traditional methods of banking, investing, and financial analysis. This research paper explores how AI is being integrated into various areas of finance, including investment management, credit scoring, fraud detection, customer service, and algorithmic trading. The study aims to understand both the advantages and challenges that come with AI implementation in financial institutions.

To achieve this, a survey-based approach was adopted, gathering responses from individuals with varying degrees of awareness about AI in finance. The collected data was analyzed to interpret general awareness levels, the perceived usefulness of AI, and concerns related to ethics, data privacy, and job displacement. The findings reveal that while AI is widely recognized for improving efficiency and accuracy, there are still concerns about trust, regulatory oversight, and the cost of implementation.

This paper concludes that while AI is revolutionizing the financial industry, it is essential to balance innovation with responsibility. The study also highlights the need for further research, awareness programs, and well-defined regulatory frameworks to ensure ethical and inclusive adoption of AI in finance.

INTRODUCTION: -

Artificial Intelligence, or AI, is no longer just a futuristic concept, it's now a real and powerful force that is changing the way many industries work, especially the financial sector. From banks and investment firms to insurance companies and fintech startups, organizations are using AI to make faster decisions, analyze large amounts of data, and provide better services to their customers.

In the past, most financial tasks like analyzing market trends, detecting fraud, or giving investment advice required a lot of manual effort and time. But with AI, many of these processes can now be done automatically and much more efficiently. Technologies like machine learning and data analytics help companies predict risks, manage portfolios, and even communicate with customers using chatbots or virtual assistants.

However, while AI brings many benefits, it also raises important questions. People are concerned about data privacy, the accuracy of algorithms, and whether AI might replace human jobs in the future. Also, not all companies have the same resources to adopt AI, which creates a gap between big financial institutions and smaller firms.

This research paper looks at how AI is being used in finance today, what advantages it brings, and what challenges need to be addressed. Through surveys and existing studies, the aim is to understand how aware people are of AI in finance, and how it is shaping the future of the industry.

By exploring both the opportunities and the concerns, this study hopes to provide a clear and balanced picture of AI's growing role in the financial world.



Background of the Topic: -

Over the past decade, Artificial Intelligence (AI) has grown from a niche area of computer science to a core part of everyday technology. From smartphones to smart homes, AI is all around us. One of the most fascinating and impactful areas where AI is making a strong presence is the financial sector. With the increasing volume of data, need for real-time decision-making, and demand for better customer service, the financial industry is turning to AI tools to stay ahead in the market. Banks, insurance companies, investment firms, and fintech platforms are now using AI to handle tasks that were once time-consuming, expensive, or even impossible to do manually.

Importance of AI in the Financial Sector: -

AI is helping financial organizations in multiple ways. It improves accuracy in credit scoring, detects fraud faster than humans, manages massive data sets for risk analysis, and offers personalized advice to customers through chatbots and virtual assistants. These applications not only reduce operational costs but also make financial services more reliable and accessible. AI also plays a vital role in algorithmic trading, helping firms make quick investment decisions by analyzing market patterns in real time. In short, AI is making financial systems more efficient, intelligent, and customer-focused, which is why its importance continues to grow every year.

Problem Statement: -

While AI has clear advantages, its adoption in the financial sector is not without challenges. There are growing concerns about the ethical use of AI, data privacy, job displacement, and algorithmic bias. Not all financial institutions, especially smaller or regional ones, have the resources or technical expertise to implement AI effectively. This creates a digital divide within the industry. Moreover, there's still a lack of awareness and understanding among professionals and customers about how AI works and what risks it may pose. Therefore, it becomes crucial to study both the benefits and limitations of AI in finance to create a clear picture of its real-world impact.

Objectives of the Research: -

The main aim of this research is to explore how Artificial Intelligence is used in the financial sector and what effects it has. The specific objectives include:

- 1. To understand the various ways AI is currently applied in finance.
- 2. To study how AI improves efficiency, accuracy, and decision-making.
- 3. To examine the challenges and risks involved in using AI.
- 4. To evaluate the level of awareness among customers and financial professionals.

5. To provide suggestions for better and responsible use of AI in the financial industry.

Scope and Limitations Scope:

This research focuses on the use of AI in the financial sector, mainly in banking, investment, risk management, and customer service. It covers how AI is applied, what technologies are used (like machine learning, NLP, and data analytics), and how they affect business operations and customer experience. The study includes both global and Indian perspectives, with insights drawn from surveys and existing research.



Limitations:

While this study provides useful insights into how AI is used in the financial sector, there are a few limitations to keep in mind. First, because AI is developing so quickly, some of the information and trends discussed might change in the near future. Also, many financial companies are cautious about sharing detailed data, so the research couldn't include a lot of real-world internal information. Most of the findings are based on secondary sources and survey responses, which may not give a complete picture. Finally, since many responses came from urban areas in India, the results may not fully reflect the situation in rural areas or in other countries.

LITERATURE REVIEW: -

Review of Past Studies on AI in Finance: -

Over the past two decades, numerous studies have examined the growing role of Artificial Intelligence (AI) in the financial sector. Researchers have largely agreed that AI has significantly improved decision-making, operational efficiency, and customer engagement across various financial services.

For instance, Bussmann (2015) discussed how machine learning and natural language processing are increasingly used by financial institutions to automate risk modeling and regulatory compliance. Davenport & Ronanki (2018) highlighted AI's ability to automate repetitive tasks and generate predictive insights in credit scoring, loan underwriting, and trading strategies.

Similarly, Arner et al. (2017) explored the global impact of AI-driven fintech solutions, emphasizing how AI-powered robo-advisors have transformed investment management by offering low-cost, data-driven portfolio advice to clients.

Studies by Accenture (2019) and PwC (2020) revealed that more than 70% of financial service providers have integrated AI into at least one of their core operations, with use cases ranging from chatbots in customer service to fraud detection systems that flag irregular transactions in real time.

Moreover, Brynjolfsson & McAfee (2017) noted that AI has moved financial institutions from descriptive and diagnostic analytics toward more predictive and prescriptive systems, significantly changing the nature of decision-making and customer personalization.

Despite these advancements, much of the existing research has focused on large, global financial institutions, with limited focus on smaller banks or financial firms in developing countries.

Gaps Identified in Existing Literature: -

While the existing body of literature offers valuable insights into how AI is transforming finance, several key gaps remain:

- Limited Regional Focus: Most research has centered on developed markets such as the U.S. and Europe. There is a lack of studies focused on AI's impact in developing countries like India, where fintech growth is rapid but regulatory and infrastructural challenges persist.
- Customer Perception: Few studies analyze how end-users, especially in rural or semi- urban regions, perceive and trust AI-based financial services like robo-advisors or AI chatbots.
- Ethical and Regulatory Issues: Although algorithmic bias, transparency, and data privacy have been mentioned in various papers, they are not examined in detail. There is limited research on the governance mechanisms needed to oversee AI's use in high-stakes financial applications.



- Integration Challenges: While the benefits of AI are well-documented, not many studies have explored the organizational challenges, such as employee resistance, cost barriers, or skill shortages that come with implementing AI technologies.
- Dynamic Nature of AI: AI technologies evolve rapidly, which means many studies become outdated quickly. There is a lack of real-time or longitudinal research tracking AI's changing role and performance over time.

Theoretical Framework: -

This research paper is guided by two well-established frameworks to understand the adoption and impact of AI in the financial sector:

1. Technology Acceptance Model (TAM)

Originally developed by Davis (1989), TAM helps explain how users come to accept and use new technologies. It posits that perceived usefulness and perceived ease of use are the primary factors influencing the adoption of technology. This framework is particularly relevant to understanding how both financial institutions and their customers decide whether to integrate AI systems into their daily operations.

2. Innovation Diffusion Theory (IDT)

Proposed by Rogers (2003), IDT explains how, why, and at what rate new technologies spread through cultures. It considers key characteristics such as compatibility, complexity, trialability, and observability. In the financial context, IDT helps assess how different financial institutions adopt AI solutions based on their size, resources, and openness to innovation.

These theoretical lenses provide a strong foundation for understanding both the organizational and individual behaviors related to AI adoption in finance.

RESEARCH METHODOLOGY: -

This chapter outlines the research design and methodological approach adopted to study the application and impact of Artificial Intelligence in the financial sector. The methodology has been carefully chosen to ensure that the research questions are addressed effectively while maintaining academic rigor.

Type of Research: -

This study follows a **mixed-method approach**, combining both **qualitative** and **quantitative** research methods. The qualitative aspect helps in understanding expert opinions, experiences, and existing literature, while the quantitative element is essential for analyzing



survey responses and identifying patterns and trends in AI adoption within the financial sector.

By using a mixed approach, the study ensures a comprehensive view of the topic, blending numerical insights with contextual understanding. This dual perspective enhances the reliability and depth of the research findings.

Research Design: -

The research design is primarily **descriptive and exploratory**. It aims to describe current AI applications in finance and explore perceptions, challenges, and future opportunities. The descriptive aspect focuses on identifying how AI is currently being used across different financial functions like investment management, credit scoring, fraud detection, and customer service.

The exploratory part of the design is used to investigate areas that are still emerging or under-researched, such as ethical concerns, regulatory frameworks, and the gap between large institutions and smaller players in AI adoption. This combination allows the research to examine both what is currently happening and what could happen moving forward.

Data Collection Methods: -

To ensure accuracy and reliability, the study uses **both primary and secondary data sources**:

- **Primary Data**: A structured **survey questionnaire** was used to collect responses from professionals, students, and individuals working in or familiar with the finance sector. The questionnaire was designed using Google Forms and distributed online. It included multiple-choice and Likert scale questions to gauge participants' knowledge, awareness, and opinions about AI in finance.
- Secondary Data: Relevant data was gathered from academic journals, industry reports, financial whitepapers, and credible websites. This helped in developing a background understanding and in validating the primary data findings.

The combination of primary and secondary data enriches the overall quality of the research and helps draw meaningful comparisons and insights.

Tools Used for Analysis: -

The data collected from the survey was analyzed using **basic statistical tools** such as percentages, charts, and graphs to interpret the responses. Google Sheets and Microsoft Excel were used to organize and visualize the data for easier interpretation.



For qualitative insights from secondary data, **thematic analysis** was applied to identify recurring patterns, major themes, and contrasting viewpoints within the existing literature.

These tools helped in summarizing large datasets and presenting the findings in a visually comprehensible and logically structured format.

Limitations of the Methodology: -

While every effort was made to ensure the reliability and accuracy of this study, there are a few limitations that must be acknowledged:

- **Sample Size**: The primary data is based on responses from a limited number of participants, which may not fully represent the larger financial sector or geographical diversity.
- **Survey Bias**: Respondents may have varying degrees of understanding of AI, which could affect the consistency of answers.
- Access to Data: Some data regarding AI applications in financial institutions is proprietary and confidential, limiting the scope of analysis.
- **Rapid Technological Change**: As AI is a fast-evolving field, some insights gathered today might quickly become outdated in the near future.

DATA ANALYSIS AND INTERPRETATION: -

This chapter analyzes the primary data collected through a structured questionnaire from 23 investors across various demographics. The aim is to understand their behavior, preferences, and the influence these have on financial decision-making. The data is interpreted through percentages, bar diagrams, and pie charts for clear representation, supported by descriptive insights.

Ages: -

Age Group	No. of Respondents	Percentage
Below 18	2	8.7%
18-25	13	56.5%
25-35	1	4.3%
35& above	7	30.4%

Interpretation : Most respondents (56.5%) are aged 18–25, indicating tech-savvy youth engagement. 30.4% are above 35, showing interest from experienced professionals too.



Gender: -

Gender	No. of Respondents	Percentage
Male	13	56.5%
Female	10	43.5%

Interpretation: - Slightly more female participants (56.5%) than males (43.5%), reflecting increasing female interest in AI and finance.

Have you heard about Artificial Intelligence (AI) being used in the financial sector?

Options	No. of Respondents	Percentage
Yes	18	78.3%
No	4	17.4%
Not Sure	1	4.3%

Interpretation: - A majority (78.3%) are aware of AI in finance, though some (21.7%) lack clarity or exposure.

Which of the following is a common use of AI in finance?

Options	No. of Respondents	Percentage
Cooking recipes	3	13%
Investment analysis	19	82.6%
Car repair	0	0%
Farming	1	4.3%

Interpretation: - Most (82.6%) know investment analysis as a key use of AI, but some chose unrelated fields, suggesting a need for better understanding.

What is a robo-advisor?

Options	No. of Respondents	Percentage
A human financial advisor	6	26.1%
A robot that dispenses	1	4.35%
cash		
An AI tool that gives	15	65.2%
automated financial		
advice		
A trading app	1	4.35%

Interpretation: - 65.2% correctly identified robo-advisors as AI tools, but confusion remains among others.



Do you th	hink AI	helps in	detecting	fraud in	n financial	transactions?
2		1	0			

Options	No. of Respondents	Percentage
Yes	14	60.9%
No	1	4.35%
Don't Know	8	34.8%

Interpretation: - 65.2% correctly identified robo-advisors as AI tools, but confusion remains among others.

Which technology is commonly used in AI systems in finance?

Options	No. of Respondents	Percentage
Machine	17	73.9%
Learning		
Typewriters	4	17.4%
X-ray Machines	1	4.3%
Electric Fans	1	4.3%

Interpretation: - 73.9% recognize machine learning as central to AI in finance, though some confusion persists.

How do banks use AI for customer service?

Options	No. of Respondents	Percentage
Using chatbots to	15	65.2%
answer queries		
Printing bank	7	30.4%
statements		
Calling customers	1	4.3%
manually		
Delivering cash	0	0%
through drones		

Interpretation: - 65.2% mentioned chatbots as AI use in banks; others mistakenly chose non- AI tasks.



Which financial area has benefited the most from AI, according to you?

Options	No. of Respondents	Percentage	
Real Estate	15	65.2%	
Algorithmic	5	21.7%	
Trading			
Public	2	8.7%	
Transport			
Food Delivery	1	4.3%	

Interpretation: - Algorithmic trading (65.2%) was seen as most benefited; a few selected irrelevant sectors.

Do you believe AI can reduce human errors in financial decision-making?

Options	No. of Respondents	Percentage
Strongly	4	17 40/
Strongly	4	1/.470
Agree		
Agree	18	78.3%
Disagree	0	0%
Strongly	1	4.3%
Disagree		

Interpretation: - Nearly all respondents agree AI reduces human errors in financial decisions. What is the biggest concern with using AI in finance?

Options	No. of Respondents	Percentage	
Cost of labor	7	30.4%	
Algorithmich bias and c	o l erns were algorithmic	Has (43.5%) a	and cost (30.4%), showing awareness of
lack of transparency ha	llenges.	· · · ·	
Poor handwriting	2	8.7%	
Internet speed	4	17.4%	



Options	No. of Respondents	Percentage
Yes	11	47.8%
No	2	8.7%
Maybe	9	39.1%
Not Sure	1	4.3%

Would you trust AI-generated financial advice?

Interpretation: - Main concerns were algorithmic bias (43.5%) and cost (30.4%), showing awareness of ethical and financial challenges.

FINDINGS

Based on the data collected and analyzed through the survey, several key findings have emerged regarding the awareness, perception, and acceptance of Artificial Intelligence (AI) in the financial sector:

- 1. **High Awareness Among Youth**: A significant number of respondents were from the 18–25 age group, indicating that young individuals are more aware and engaged with the developments in AI, particularly in finance.
- 2. Gender Participation is Becoming Balanced: Female participation was slightly higher than male, suggesting that AI and financial technology are increasingly attracting women, reflecting a shift toward gender balance in this field.
- **3.** Widespread Awareness of AI in Finance: The majority of respondents were already aware that AI is being used in financial services. This indicates that AI in finance is no longer a niche concept but is entering mainstream public knowledge.
- 4. **Correct Understanding of AI Applications**: Most participants correctly identified major AI applications like investment analysis, chatbots, and fraud detection, showing a good understanding of how AI supports financial operations.
- 5. Knowledge Gaps Still Exist: While many respondents answered correctly, a notable percentage selected unrelated or incorrect options, indicating the need for more awareness and education around AI's specific role in finance.
- 6. **Trust in AI Tools is Growing**: There is a clear indication that people trust AI tools like roboadvisors and fraud detection systems. However, a small group remains skeptical or unsure, showing room for trust-building.
- 7. Concerns About Ethical and Cost Issues: Respondents expressed concern about algorithmic bias, lack of transparency, and high implementation costs. This reflects a mature understanding of the risks and limitations associated with AI.



- 8. Support for AI's Accuracy: A large portion of respondents agreed that AI helps reduce human errors, reinforcing the belief that AI can enhance the accuracy and reliability of financial decision-making.
- **9. AI's Role in Customer Service is Recognized**: Many respondents acknowledged the use of AI in banking, especially in areas like chatbots, indicating acceptance of AI in improving customer experience.
- **10. Algorithmic Trading Seen as a Major Beneficiary**: Among various financial applications, algorithmic trading was seen as the area where AI has brought the most benefits.

CONCLUSION: -

The research clearly shows that Artificial Intelligence (AI) is becoming an essential part of the financial sector. From enhancing customer service with chatbots to making complex investment decisions through algorithms, AI is transforming the way financial institutions operate. The majority of the respondents in the survey demonstrated a good understanding of AI and showed a positive attitude towards its growing use in finance.

It was evident that young individuals are more aware and accepting of AI-based financial tools, which indicates a shift in how future generations will interact with financial services. While many people trust AI for its speed, accuracy, and ability to reduce human error, there are still valid concerns regarding ethical transparency, cost of implementation, and algorithmic bias.

The study highlights the need for better awareness, training, and policy support to ensure the responsible use of AI. Financial institutions must strike a balance between automation and human oversight to build trust and ensure fairness in AI-powered decisions. As AI continues to evolve, its responsible adoption will be crucial in shaping a more efficient, inclusive, and secure financial system.

SUGGESTIONS/RECOMMENDATIONS: -

1. Promote AI Awareness and Education

Financial institutions and educational bodies should organize training sessions, workshops, and awareness programs to improve understanding of how AI works in finance. This can help reduce fear or misconceptions about AI among both professionals and customers.



2. Encourage Responsible Use of AI

Companies should ensure AI systems are used ethically, with transparency and fairness. Clear policies should be created to address issues like algorithmic bias, data privacy, and decision accountability.

3. Improve Regulatory Frameworks

Governments and financial regulatory authorities should develop updated guidelines to govern the use of AI in finance. These regulations must ensure both innovation and consumer protection.

4. Support Smaller Institutions

Since large financial firms are more capable of implementing AI, governments or industry bodies should help smaller institutions adopt AI through subsidies, shared platforms, or partnerships with fintech startups.

5. Strengthen Data Privacy and Security

As AI systems rely heavily on customer data, it is vital to build secure systems that protect personal and financial information. Institutions must invest in robust cybersecurity infrastructure.

6. Combine Human Intelligence with AI

While AI offers speed and accuracy, human involvement is still crucial for decision-making in sensitive or high-risk scenarios. A hybrid approach should be adopted where AI supports, rather than replaces, human judgment.

7. Focus on Financial Inclusion

AI should be used to reach underserved populations, such as those in rural areas, by offering affordable and personalized financial services like microloans, robo-advisory, and digital banking.

8. Monitor and Evaluate AI Tools Regularly

Continuous monitoring of AI systems is important to ensure they perform correctly, remain unbiased, and adapt to market changes. Institutions should perform regular audits and model testing.

9. Invest in Research and Development More funding and support should be provided to AI research specific to



the financial sector. This can lead to better tools, customized solutions, and safer implementation practices.

10. Build Public Trust in AI

Financial companies must be transparent about how AI is used, what data is collected, and how decisions are made. This openness will help gain the trust of customers and users.

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