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A study on role of Artificial Intelligence in Financial Services with special reference to Coimbatore

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Abstract
The financial services sector is undergoing a change thanks to artificial intelligence (AI), especially in the area of financial technology (Fin Tech). By improving efficiency, accuracy, and security, artificial intelligence (AI) integration in Fin Tech has drastically changed traditional financial services. Financial institutions may improve decision-making, streamline operations, and provide individualized consumer experiences with the help of artificial intelligence (AI) technologies including machine learning algorithms, natural language processing, and predictive analytics. The automation of previously labour intensive and error-prone tasks is one of the main effects of AI in Fin Tech. AI-powered systems have the capacity to handle massive amounts of data quickly, which makes it possible to make decisions about investment strategies, risk assessment, and fraud detection more quickly and accurately. These developments save financial organizations money while simultaneously increasing operational effectiveness.

Keywords: Artificial intelligence, machine learning, algorithm, automation, chat bots

Introduction

Although artificial intelligence dates back more than half a century, its possibilities have increased significantly in recent times. This is prompting the development of numerous practical applications, both in the financial and other sectors. Artificial intelligence tools can provide major benefits, allowing certain tasks to be automated and boosting analytical capacity compared with traditional techniques. However, they also present a series of limitations that can make them unsuitable for certain activities, along with a set of risks that must be managed appropriately. The following paragraphs describe in more detail the use financial institutions are making of these tools, together with some of the opportunities and challenges they present.

Artificial intelligence (AI) in finance helps drive insights for data analytics, performance measurement, predictions and forecasting, real-time calculations, customer servicing, intelligent data retrieval, and more. It is a set of technologies that enables financial services organizations to better understand markets and customers, analyse and learn from digital journeys, and engage in a way that mimics human intelligence and interactions at scale.

Objectives of The Study

- To provide an overview of the current state of Al in finance.
- To examine the impact of Al on different aspects of finance.
- To explore the potential benefits of Al in finance.
- To study Advantages and disadvantages of Al in finance.
- To identify the current and future use of Al in financial services.

Statement of The Study

The rapid adoption of Artificial Intelligence (AI) and related technologies like machine learning and Generative AI is significantly transforming the financial services industry, offering benefits such as enhanced efficiency, improved risk management, personalized customer experiences, and new revenue opportunities. However, this swift integration also presents several complex challenges and risks that require careful consideration to ensure responsible and equitable development and deployment.

Scope of The Study

- To understand the specific applications and benefits of AI in various areas of financial services such as banking, investment, insurance, and risk management.
- To analyse the impact of AI technologies, including machine learning and natural language processing, on improving efficiency, accuracy, and customer experience with in the financial sector.
- To investigate the challenges and opportunities presented by the adoption of AI in Fin Tech, including regulatory concerns and ethical considerations.
- To explore the potential future trends and developments in AI-driven Fin Tech innovation and disruptive business models.
- To offer recommendations for financial institutions and policymakers on leveraging AI effectively.

Limitations of The Study

This study has several limitations. The geographical scope is restricted to Coimbatore city and surrounding regions and the sample size is limited to respondent. The self-reported data and questionnaire design may introduce basis. The-cross sectional design and lack of control group limit longitudinal analysis and comparison.

Data Collection Methods

Primary data: The Data have been collected with the help of Structured Questionnaire. A sample size of 75 was selected using the convenience sampling.

Secondary data: has been collected from various website and journals for the analysis.

Tools used for Analysis

- Simple Percentage
- Chi-Square

Simple Percentage: Simple Percentage Analysis refers to a special kind of rate or percentage (%) used in making comparisons between two or more series of data. A percentage is used to determine the relationship between the series.

Chi-Square: The Chi-Square test is done to check if there is any difference between the observed value and expected value. Chi-Square formula $x^2 = \Sigma$ (O-E) 2/E.

Review of Literature

- The use of AI in financial services has attracted significant academic and industry interest. Recantation (2024) points out that AI has transformed the entire financial system through advanced computer technology and Big Data Analytics, especially in risk management areas such as bankruptcy prediction, credit risk forecasting, fraud detection, and early warning systems for monitoring the financial system.
- Al *et al*. (2024) emphasize that finance presents strong opportunities for integrating technologies like AI, machine learning, block chain, AR/VR, and quantum mechanics. These emerging technologies together contribute to creating a financial environment that is more transparent, optimized, stable, and agile, meeting the evolving needs of the industry.
- 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

Simple Percentage Data Analysis and Interpretation

Table 1: Shows age of the respondent

S.no	Particulars	No of respondent	Percentage %
1	18 to 25 years	53	71%
2	25 to 40 years	11	15%
3	40 to 50 years	10	13%
4	50 to 60 years	1	1%
	Total	75	100%

Interpretation

From the above table shows 71% of respondents are 18-25 years and 15% of respondents are 25-40 years and 13% of respondents are 40-50 years and 1% of respondents are 50-60 years. Hence the Majority 71% of respondents are 18-25 years.

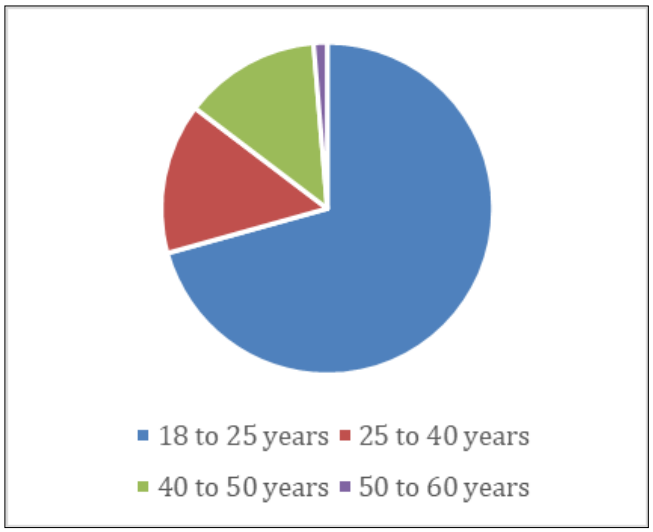

Table 2

S.no	Particulars	No of respondent	Percentage %
1	AI Chat bots	27	36%
2	Robotics	26	35%
3	Fraud Detection alert	13	17%
4	Loan Approval	9	12%
	TOTAL	75	100%

Shows the used ai service of the respondent

Interpretation

From the above table shows 36% of respondents are AI Chat bots and 35% of respondents are Robotics and 17% of respondents are Fraud Detection alert and 12% of respondents are Loan Approval. Hence the Majority 36% of respondents are AI Chat bots.

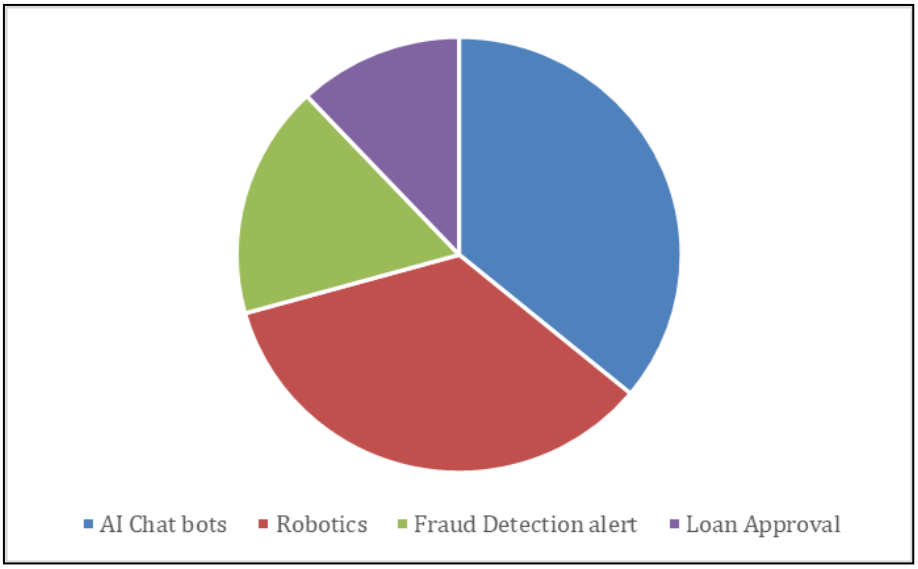

Table 3: Shows the Demographic Profile

S.no	Demographic	Particulars	No of respondents	Percentage %
1	age	18 to 25 years	53	71%
		25 to 40 years	11	15%
		40 to 50 years	10	13%
		50 to 60 years	1	1%
2	using ai service	AI Chat bots	27	36%
		Robotics	26	35%
		Fraud Detection alert	13	17%
		Loan Approval	9	12%

Interpretation

Clearly states the demographic profile of the sample respondents. The Majority 71% of respondents are 18-25 years of age group. The Majority 36% of respondents are AI Chat bots in financial service.

Chi – Square Analysis

Table 4:

AGE	AI Chat Bots	Robotics	Fraud Detection Alert	Loan Approval	Grand Total
18 to 25 years	17	13	10	13	53
25 to 40 years	3	3	3	2	11
40 to 50 years	3	4	2	1	10
50 to 60 years	-	1	-	-	1
Grand Total	23	21	15	16	75

Interpretation

sFrom the above table shows the majority of the participants are in the 18 to 25 years age group accounting for 53 out of the 75 people. The other age group have significantly fewer participants. Across all age groups AI Chat Bots, Robotics are the most represented categories with 23 and 21 total individuals respectively. Loan Approval, Fraud Detection Alert have fewer participants with 16 and 15 respectively.

Chi-Square Table

O	E	O-E	(O-E)2	(O-E)2/E
17	16.27	0.73	0.53	0.03
13	14.84	-1.84	3.38	0.23
0.2310	10.60	-0.60	0.36	0.03
13	11.31	1.69	2.86	0.25
3	3.37	-0.37	0.14	0.04
3	3.08	-0.08	0.01	0.00
3	2.20	0.80	0.64	0.29
2	2.35	-0.35	0.12	0.05
3	3.07	-0.07	0.00	0.00
4	2.80	1.20	1.44	0.51
2	2.00	0.00	0.00	0.00
1	2.13	-1.13	1.28	0.60
0	0.28	-0.31	0.10	0.31
1	0.28	0.72	0.52	1.86
0	0.20	-0.20	0.04	0.20
0	0.21	-0.21	0.04	0.21
-	-	-	-	4.63

Chi-Square Analyis

Variable	Degree of freedom	Level of significance	Table value	Calculated value	Accepted/rejected
Age and used AI service	9	0.05	16.92	4.63	Rejected

The level of significance is 5%.

Result

The calculated chi-square value (4.63) is less than the critical chi-square value (16.92) at a 0.05significance level with 9 degrees of freedom. Therefore, the result is not significant.

Findings

Simple Percentage Analysis

1. The Majority of the Respondents 71% are 18 to 25years age group.
2. The Majority of the Respondents 60% are Female of Gender.
3. The Majority of the Respondents 52% are Student of Occupation.
4. The Majority of the Respondents 33% are Undergraduate of Educational Qualification.
5. The Majority of the Respondents 39% are Less than 12000 of Income of financial services.
6. The Majority of the Respondents 47% are Social Media of learn in AI financial services.
7. The Majority of the Respondents 69% are AI based financial services.
8. The Majority of the Respondents 36% are AI Chat Bots of financial services.
9. The Majority of the Respondents 43% are Very Useful of AI financial services.
10. The Majority of the Respondents 50% are Agree for AI in faster and more efficient.
11. The Majority of the Respondents 72% are AI based service.
12. The Majority of the Respondents 45% are Fully Trust in Handling in financial data.
13. The Majority of the Respondents 56% are Convenience & Speed of AI financial services.
14. The Majority of the Respondents 60% are Data Privacy & Security of AI financial services.
15. The Majority of the Respondents 73% are financial service of next 5years transformations.
16. The Majority of the Respondents 64% are financial service to other in AI based.
17. The Majority of the Respondents 41% are banking of most AI opinion.
18. The Majority of the Respondents 37% are Stronger Security in AI financial services.
19. The Majority of the Respondents 52% are Highly Significant of AI financial services.

Suggestions

- Financial institutions should adopt advanced encryption and AI-driven cybersecurity tools to safeguard customer data and prevent misuse or fraud. Stronger data governance policies must be implemented to build customer trust.
- Continuous training programs should be introduced to help employees understand and work efficiently with AI tools. Human–machine collaboration can greatly improve efficiency and reduce operational errors.
- AI systems used in lending, credit scoring, and investment recommendations should be transparent and explainable. This helps prevent bias and builds consumer confidence in AI-based decisions.
- Banks and financial firms can use AI to offer personalized financial advice, product recommendations, and real-time customer support through chat bots — improving user satisfaction and loyalty.

Conclusion

The study concludes that Artificial Intelligence (AI) has become a transformative force in the financial services sector, revolutionizing how organizations operate and interact with customers.AI applications such as chat bots, robot-advisors, fraud detection systems, and predictive analytics have improved efficiency, accuracy, and decision making across banking, insurance, and investment services. Overall, AI has enormous potential to reshape the financial ecosystem by making services faster, smarter, and more customer-centric. With proper regulation, continuous innovation, and awareness, AI can drive the industry toward a more secure, transparent, and inclusive financial future.

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