



Financial Innovation through Artificial Intelligence: An Empirical Study of Financial Institutions in Vidarbha

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Abstract

The empirical study is done to find out the effects of Artificial Intelligence (AI) on financial innovation in financial institutions in Vidarbha, Maharashtra. The core of the study is to define major uses of Artificial Intelligence, evaluates their impact on operational efficiency, prevention of fraud, customer satisfaction, financial product innovation, and point out challenges and opportunities. Convenient sampling was used to administer a structured questionnaire to 100 financial institutions and constituted primary data. The findings demonstrate that the impact of the Artificial Intelligence on the financial innovation is serious and positive, and such areas as fraud detection, operational efficiency, and greater levels of customer satisfaction are the key contributors. The paper comes up with a conclusion that Artificial Intelligence can be effectively used to enhance the competitiveness and service delivery of financial institutions. Correct policy guidance, training and technological investment can assist the financial institution to realize its full potential.

Keywords: Artificial Intelligence, Financial Innovation, Customer Satisfaction, Operational Efficiency, Fraud Detection, etc.

1.1 Introduction

Artificial intelligence (AI) has brought a radical change in the financial sector in the last few years. AI applications are becoming popular in financial institutions to facilitate efficient operations, decision-making, risk reduction, and customer experience (Cao, 2021; Cucculelli & Recanatini, 2023). In India, the revolution is particularly interesting, driven by aggressive digitalization efforts, including India Stack and UPI, and favorable regulatory policies of such institutions as the Reserve Bank of India (RBI) and RBI Innovation Hub (RBI, 2022). Although the bulk of research on AI in banking and finance is accumulating around the world, little empirical research has been conducted on how the technologies are being deployed and felt by financial institutions regionally, specifically in Vidarbha, one of the most important regions in Maharashtra.

The proposed study will close this gap by investigating the nature of AI-based financial innovation transforming the activities of banks and non bank financial institutions in Vidarbha. The research makes use of quantitative surveys and qualitative interviews with managers and technologists along with the analysis of operational data to investigate the most widespread AI uses cases (e.g., fraud detection, credit scoring, chatbots), define performance improvements and reveal area-specific adoption barriers. With the case of Vidarbha, the study shall generate fresh empirical data to the existing body of literature regarding innovation uptake in regions within emerging economies, and offer practical policy and management prescriptions that may be used by stakeholders throughout Maharashtra.

2.1 Literature Review

The AI finance revolution comes in various aspects, such as risk management, operational efficiency, digital inclusion, and customer engagement. On a Macro level, AI use cases are algorithmic trading, credit underwriting, fraud detection, and robo-advisors have transformed the global financial markets and service delivery (Thumar & Vaghasiya, 2024; Cucculelli & Recanatini, 2023). Another way in which AI can improve the process is rule-based automation (robotic process automation) that allows institutions to scale routine tasks (Thumar & Vaghasiya, 2024).

The use of AI in financial services is already common in the context of India. It is reported that 51 % of financial institutions apply AI to prevent fraud, 56 % apply it to risk analytics (AI Trends India, 2023). 集issentMajor banks—such as SBI, HDFC, ICICI, Axis, and Bank of Baroda have implemented AI-powered chatbots and virtual assistants as well AI analytics



platform (Scribd, 2025; MDPI, 2021). The example of HDFC bank with its On Chat and SIA, the chatbot of the SBI, demonstrates the implementation of AI in the work of major banks to enhance the experience of their customers (MDPI, 2021). On the regulatory level, RBI Innovation Hub is driving AI experimentation and auxiliary infrastructure experimentation system-wide (RBI, 2022).

Indian-based empirical studies also identify some of the catalysts and impediments in AI implementation. According to Pahari (2023), technological readiness and organizational culture were the most important enablers, whereas the regulatory oversight and data governance were the most important barriers. In the same regard, research (An Empirical Study, 2024) stresses the role of leadership support and policy alignment and data privacy concerns as facilitating factors towards AI integration success. Moreover, AI has been shown to be able to increase financial inclusion by solving the problem of information asymmetry and allowing risk-based approaches to inclusion to be undertaken amongst low-income populations (Mhlanga, 2020; Garg et al., 2024).

There are, nonetheless, obstacles. The problem of algorithmic fairness, data quality, responsibility, or regulatory transparency are frequent issues (MDPI, 2021; Cao, 2021). The issue of cybersecurity is also paramount since the growing familiarity with AI systems creates new points of weakness (Reim et al., 2020; Lopes & Pereira, 2019). As possible solutions to this, explainable AI and federated learning have been suggested as the methods that might help reduce these risks and guarantee regulatory compliance without losing the trust of customers (Awosika, Shukla & Pranggono, 2023).

Scholars all over the world stress the importance of applying powerful theoretical frameworks, like Technology Acceptance Model (TAM), UTAUT, and institutional theory, to the research of AI adoption in finance (MDPI, 2022). In addition, bibliometric reviews indicate promising directions that require future research, such as AI regulation, inclusion tactics, and empirical data at the regional level (Cucculelli & Recanatini, 2023; Hentzen et al., 2022; Biju et al., 2020).

To conclude, the literature indicates that AI is revolutionizing the financial sphere, bringing substantial improvements in efficiency levels, innovations, customer experience, and inclusion. Concurrently, it triggers the issues of ethics, regulation and regional adaptability particularly in semi urban and agriculturally based regions such as Vidarbha. However, empirical knowledge about the AI implementation process in these regions is scarce, as well as the knowledge about the influence of local institutional factors on the results. The proposed study fills this gap by studying AI-enabled innovation within the financial ecosystem of Vidarbha with the view of enriching theory and practice.

3.1 Objectives:

The study aims at investigating empirically the effects of artificial intelligence on financial innovation by the financial institutions in Vidarbha, Maharashtra. The project will help to uncover major applications, evaluate their impact on operational performance, and learn the difficulties and opportunities that the implementation of AI in the area brings.

3.2 Methodology:

The research design used in the study is descriptive as well as analytical as it aims at empirically finding out the effects of artificial intelligence on financial innovation in financial institutions in Vidarbha, Maharashtra. The primary data is obtained by use of a structured questionnaire that is given to a sample size of 100 financial institutions which were conveniently sampled amongst the banking and non-banking financial companies of the Vidarbha region.

4.1 Data Analysis:

In order to understand the effect of Artificial Intelligence on financial innovation among financial institutions in Vidarbha region, 100 financial institutions were surveyed in the region. Their perceptions and practices regarding Artificial intelligence and financial innovation were encapsulated in the questionnaire. Descriptive statistics were then computed and the results were entered in a tabular form and interpreted to make meaningful conclusion.

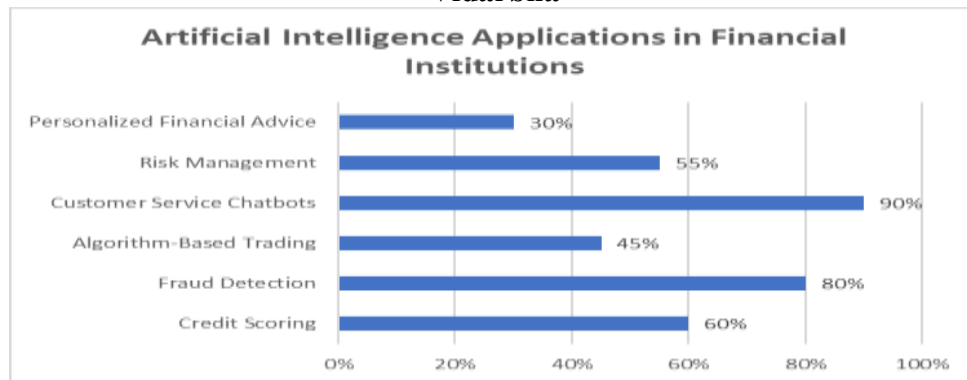
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Fig. 1: Extent of Artificial Intelligence Applications in Financial Institutions in Vidarbha



As demonstrated in fig. 1, the most commonly adopted AI use cases in financial institutions in Vidarbha are customer service chatbots (90%) and fraud detection (80%). Less popular are algorithm-based trading (45%) and personalized financial advice (30%), credit scoring (60%) and risk management (55%).

Fig. 2: Impact of Artificial Intelligence on Financial Innovation (Average Rating)

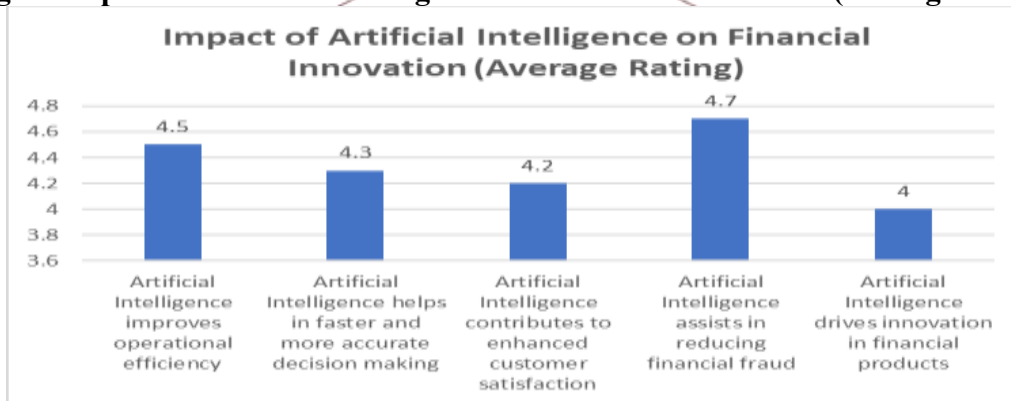


Fig. 2 depicts that there is a uniform consensus across financial institutions that Artificial Intellect has a positive influence on financial innovation. Reducing financial fraud has the highest average score (4.7) implying that it plays a prominent role in enhancing the safeguards of financial institutions. Artificial Intelligence also has a significant impact on operational efficiency (4.5) and decision making (4.3), and the need to increase customer satisfaction (4.2) and financial product innovation (4.0) are secondary but significant effects as well.

Fig. 3: Overall Benefit-Sensitivity to Artificial Intelligence

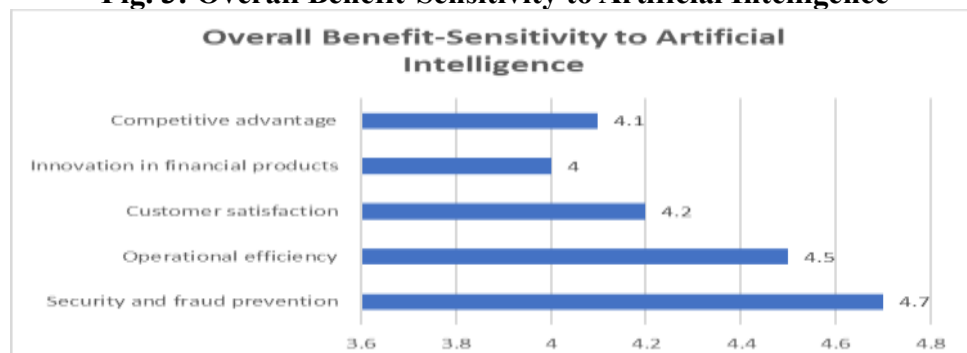


Fig. 3 also emphasizes that, according to the financial institutions, the most significant advantage generated by Artificial Intelligence is seen in better security and fraud prevention (4.7). This is closely related with operational efficiency (4.5) and customer satisfaction (4.2) as part of their major contribution on the competitiveness and service delivery of financial institutions in Vidarbha.

All the data show that Artificial Intelligence can be the strong platform of the financial institutions in Vidarbha. It aids in cutting down fraud, enhancing operational performance, aids



in decision making and facilitates financial innovation, and this builds their overall competitiveness and service delivery. The empirical examination highlights the increased importance of Artificial Intelligence in the financial sector of Vidarbha, which points to the fact that the further investments into the related technologies are needed.

5.1 Conclusion

The empirical investigation discloses that Artificial Intelligence is massively taking its toll on financial innovation by financial institutions in Vidarbha, Maharashtra. The statistics show that there is a vehement and beneficial effect on operational efficiency, prevention of fraud, customer satisfaction, and financial product innovation. Artificial Intelligence is mainly applied by the financial institutions to serve customers, identify frauds and credit scoring which indicates the increased involvement of Artificial Intelligence to reinforce the financial activities. The paper also indicates that financial institutions identify Artificial Intelligence as an effective instrument to support decision making and promote competitiveness. All in all, Artificial Intelligence is not only an emerging trend but the need of financial institutions that want to maintain a pace with a fast-evolving financial environment.

5.2 Recommendations

It is also based on the findings of the study, it is suggested that financial institutions in Vidarbha ought to consider expanding the uses of Artificial Intelligence to other financial services, which include algorithmic portfolio management and customized financial recommendations. The employees of financial institutions should be allowed to get the best out of these technologies through proper training and upskilling programs. Moreover, to ensure the privacy of data, fairness, and ethical use of Artificial Intelligence, regulators and financial institutions should develop simple guidelines and standards of its use. Last but not least, financial institutions must invest in the creation of reliable IT infrastructures and effective cybersecurity mechanisms so that to pursue the maximum benefit of Artificial Intelligence and minimize the associated risks.

5.3 Scope for Future Research:

The present study leaves some avenues of future research in the field of financial innovation using artificial intelligence. The comparative effect of artificial intelligence in various financial institutions, industries or geographical locations could be subject of future research along with the long term effects on financial performance and customer loyalty. What is more, the ethical, regulatory and policy implications of introducing artificial intelligence in the financial services could be investigated further, as well as the methods of ensuring that the fruits of this adoption are maximized and any risks are appropriately managed.

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