



## Impact of artificial intelligence on financial inclusion: Opportunities and challenges

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### Abstract

Financial inclusion has well emerged as one of the critical developmental priority in India, aiming to mainly ensure equitable access to various affordable financial services for marginalized as well as the underserved populations.. The past couple of years have seen the artificial intelligence become a disruptive technology in the financial industry that provided new means of surmounting the old obstacles to inclusivity, including the absence of credit history, geographical distance and high transaction rates. The paper approaches the issue of the impact of the artificial intelligence on the financial inclusion in India with opportunities and threats. The analytical methodology used in the paper can be described as a qualitative-quantitative one as it is aimed at discussing how utilization of the AI-enhanced tools of alternative credit scoring, online lending service, chatbots, and fraud detection systems have made more people have access to the banking and other financial service providers. As shown in the study, the accessibility, effectiveness, and customization of financial services and services, especially by low-income and rural citizens, has significantly improved using artificial intelligence. Once more, though, the disadvantage of the holistic effects still lingers in data privacy quandary, the partiality of the algorithms, the dilemma of the digital literacy, and regulatory preparedness. The researchers find out that AI could become an efficient contributor to the Indian population becoming financially empowered in case the legal regulations, ethical issues, and equal digital infrastructure are protected accordingly.

**Keywords:** Artificial intelligence, financial inclusion, digital finance, inclusive growth, India

### Introduction

Financial inclusion refers to the main process of properly ensuring access to appropriate, affordable, as well as timely financial products and also the services for all sections of society, particularly marginalized and also the low-income groups. Financial exclusion in India has been caused by poverty, informality of the incomes, non-availability of documentations among others and geographical barriers. Although drastic policy measures and activities, such as banks of operation and lending to the priority sector, the percentage of the population yet to be inducted into the official financial base remained quite huge until the digitization of the financial reforms (Rangarajan, 2008). The focus on financial inclusion has been placed in the government of India economic development through programmes like the Pradhan Mantri Jan Dhan Yojana and digitization of development of payment infrastructure. The programs establish the foundation in terms of the exploitation of modern technologies in the developmental aspect of inclusion. The changing digital financial environment has facilitated conditions and one of them is the artificial intelligence (Government of India, 2020) [4].

Artificial intelligence can also be called as the computer systems which can successfully design activities that traditionally demand the human intellect e.g. learning, reasoning as well as decision-making. The AI applications in the financial sector are that of credit risk analysis, robots in customer service, fraud, and individualized financial guidance. The applications are also very speculative regarding increasing the financial access of underserved population (Reserve Bank of India, 2022) [8].

The alternative credit assessment is one of the most profound consequences of the artificial intelligence on the finance inclusion trend. The traditional-based credit rating systems are exceptionally dependent on official credit reports which are not possessed by the poor. Other data is

also considered on creditworthiness: mobile usage behavior, the history of transaction, and behavioral indicators based on AI-generated models therefore, first-time borrowers can access formal credit (Bharat Financial Inclusion Report, 2019) [2].

Electronic lending services that are based on artificial intelligence have allowed microcredit and small lending to be more accessible. The platforms have the capability of providing preposterously low-priced and faster credit to small businesses, informal workers and household economies as well due to the automation of the lending process and lower cost of doing business. Empirical studies on lending have been performed in India and indicate that both the time required to approve and credit penetration within the underserved populations have been minimized through AI (Sriram and Reddy, 2021) [9].

The virtual assistants, including chat bots, have also helped artificial intelligence to increase customer engagement and financial literacy. These applications are multi lingual application and twenty four hour assistance that assists the amateurs to navigate through online financial services. The use of artificially intelligent conversational interface has also been crucial in classifying information to a culturally diverse state such as India in which the information asymmetry was and continues to be present and such a factor has brought about more user confidence (NITI Aayog, 2021) [6].

Another area where artificial intelligence will be exercised to ensure more low-income earners are incorporated in financial service industry is in fraud detection and risk management. The use of artificial intelligent systems in financial systems on the internet builds more credibility because it notifies when the transaction is suspicious. The existence of more trust is also central in the initiation of adoption of such population groups that had a history of

being distrustful of government financial institutions (Reserve Bank of India, 2022)<sup>[8]</sup>.

But it is not that easy with the introduction of artificial intelligence in financial inclusion. The fears of privacy of the information, the visibility of the algorithms, and the possibility of biases have brought the questions of the fairness and the responsibility of the AI-based financial decision-making. Researchers warn that AI getting out of control will initiate the process of excluding the vulnerable population and will not incorporate them instead of incorporating them (Sundararajan, 2023).

In India, the level of digital literacy and access to technology still remains unequal. Though these are the people in the cities that benefit the opportunities of AI-based financial services more, the rural and disadvantaged population may have to deal with the absence of connections, as well as the absence of digital literacy. Such differences precondition the potential of the new type of marginalization of digital mediated financial relations (Azim Premji Foundation, 2021)<sup>[1]</sup>.

The necessity to pay the closer attention to the niche of artificial intelligence is urgent because the provided niche suggests some broad opportunities and creates some challenges concerning the Indian context and the additional financial inclusion. The paper being proposed aims to evaluate the facilitating opportunity and structural limitation of the AI-based financial inclusiveness, which might be integrated into the academic literature on the problem of policy.

**Methodology**

The present paper took up the descriptive and analytical research design whereby the researcher was interested in establishing the role of the artificial intelligence in the financial inclusion in India. The quantitative methods of analysis (based on the secondary data) and the qualitative methods (based on the reports of the policy and empirical research) were used as a combination. The method can be used to a great extent when analysing rather intricate socio-technical mechanisms like artificial intelligence-supported financial inclusion (Creswell and Plano Clark, 2018)<sup>[3]</sup>.

The chief source of information that was used in this study was the secondary data. The information was gathered using the reports obtained at the reserve bank of India, the NITI aayog, the government policy documents and the peer-reviewed scholarly journals. These sources summarized stories of how the artificial intelligence has been embraced and the effects in the Indian financial sector.

The paper has contemplated part of the AI application in areas where they may be applied to financial inclusion that revert to digital payments, credit dispensation, customer services, and risk management. The choice of the areas was also based on the previous studies carried out in India, which had noted the importance of the areas as a tool in the

selection result (Bharat Financial Inclusion Report, 2019)<sup>[2]</sup>. This required the use of a comparative analytical model to study the changes that were brought about on the financial access of the financial access before including the AI-driven systems. The information that included the ownership of accounts, credit penetration, and frequency of transaction and efficiency of service delivery was available in its compared indicators.

To be in a position to identify the similarity patterns in the opportunities and challenges, they performed a qualitative research through conducting thematic review of the policy documents and scholarly literature. The equity, ethics, and governance issues have been taken into consideration paying special attention to which the problems of the AI implementation in the developing economies are concentrated (NITI Aayog, 2021)<sup>[6]</sup>.

To provide real life situations, India AI based financial project(s) Case Studies were provided. These were AI-based loans and services to underserved communities online banking. Case-based analysis Case-based analysis Case-based analysis is the most frequent approach applied to analyze the Indian financial inclusion literature to put the quantitative findings into context (Sriram and Reddy, 2021)<sup>[9]</sup>.

Ethical thinking was also part of the methodology since it was a critical thinking process of the data governance models and regulatory rules. The paper was tuned to the new information security standards and moral AI regulations which were reflected in the Indian policy system (Government of India, 2023).

The synthetic details of the conclusions in the various sources were subjected to the analysis process in order to demonstrate the overall effect of artificial intelligence on the financial inclusion. Through this integration, not only have actions to be detected been made facilitated, but also structural limitations.

Its weak points of the methodology are that it uses secondary data and has not used the primary fieldwork. Nonetheless, it had a higher degree of reliability and validity because of the triangulation of the various plausible sources.

**Results**

As the discussion shows, the aspect of the provision of formal financial services has been quite accessible to the environment of artificial intelligence especially in India, in the field of credit provision and payments. The low transaction cost and efficiency in service delivery have also seen AI systems effective in the delivery of financial products to the low-income earners.

The secondary data indicate that the existing trend which is carried out on digital transactions and payments on micro credit is increasing when the solutions based on AI conduct are introduced. This trend pretends to render the very idea of scalability and access one, because of automation and information based decision making.

**Table 1:** AI Applications and Financial Inclusion Outcomes

AI Application Area	Inclusion Outcome
Alternative credit scoring	Increased access for first-time borrowers
AI-based lending platforms	Faster loan approvals and wider reach
Chatbots and virtual assistants	Improved customer support and literacy
Fraud detection systems	Enhanced trust in digital finance

It also led to efficiency in the process of loaning as well as customer onboarding since the automated verification and risk assessment enabled iBank to save time in granting loans

to small buyers which was a blessing to small buyers who were previously exposed to a lengthy process.

**Table 2:** Key Opportunities and Challenges of AI in Financial Inclusion

Dimension	Observations
Opportunities	Scalability, personalization, cost reduction
Challenges	Data privacy, bias, digital divide

Regardless of this realized gains, it is observable that there are indications of any variations of the gains made by the various categories of the people. Urban and digitally savvy users were growing quicker and the countryside population were being suffocation throttled by the connectivity and awareness issue.

The fears about the bias of the algorithms were recorded in the studies that determined various credit performance of some groups. Such findings suggest the need to have the transparent and accountable AI systems.

Preparation of regulations was an ambivalent goal that was realized. Although the regulators in India have been using the promotion of innovation, it has some loopholes in the mechanisms used in regulating financial services founded on AI.

On the whole, the findings indicate that artificial intelligence has been utilized as a supplement to financial inclusion, however, it has not given an answer to structural imbalances as such.

**Discussion and Conclusion**

As demonstrated in this paper, artificial intelligence will become an enormous powerhouse towards achieving the objective of financial inclusion in India that has the potential to do away with barriers to access, affordability and efficiency, which have always been present in its presence. The AI-based innovations have provided a platform to reach the masses comprising underserved people by financial institutions as per the national development goals.

The opportunity to apply alternative data and automatize the decisions may be discussed in the connection with the success of the AI designed financial inclusion schemes. These real-estates have diminished the necessity of the past credit history of history, and physical infrastructure, which have marginalized the majority of classes of the people in other aspects.

It is also however in the study that some of the great issues start to be arrived at concerning what is required to realize inclusive and equitable outcomes. Of particular importance is the issue of data privacy and transparency of the algorithms, in the situation where the AI is not regulated on a case-by-case basis.

One of the constraints is the digital divide. The use of AI in the financial services industry will only widen the concerns as is already being faced unless with parallels of investment in digital infrastructure and financial literacy.

There ought to be governing structures that are ethical in order to reduce the possibilities of favoritism and marginalization. It has got based in the political works of the Indians concerning the responsible use of AI, which are, however, not introduced to an institution on par.

To conclude, AI could be so much to Indian financial inclusion, yet it can pay off with the help of favorable policies, moral safety, and the digital ecosystems that are consumed. More studies should be carried out to debate the effects of AI regulation at a longer-term period, user experience, and capacity to exploit elements of AI regulation to make inclusive AI-driven finance.

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