

# ROLE OF AI AND FINTECH IN IMPROVING FINANCIAL INCLUSION IN INDIA

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## ABSTRACT

The Emerging era of Artificial Intelligence (AI) and Fintech plays crucial role to enhance the inclusion of financial products and services. On the one hand Fintech refers to the integration of technology into offerings by financial services companies to improve their use and delivery to consumers and on the other hand financial inclusion is the availability and equality of opportunities to access financial services. It refers

to processes, by which individuals and businesses can access appropriate, affordable, and timely financial products and services which include banking, loan, equity, and insurance products. To explore the same this research work lo aims to analyze the role of artificial intelligence and fin-tech innovations, such as digital banking, mobile money, and block chain technology, in promoting Sustainable Financial Inclusion in India. Also to identify various issues and challenges, and regulatory compliance of artificial intelligence (AI) and fintech in to Banking and Financial sector.

**Keywords:** Artificial intelligence (AI), Fintech, financial services, Sustainable Financial Inclusion, etc.

## INTRODUCTION

The new field of Artificial Intelligence and financial technology (fintech) has been emerged as a transformative force in the Indian financial landscape. Technologies like AI facilitating India's banking and financial services area. Automated and Personalized banking services through solutions like digital lending and mobile banking are promoting financial inclusion and bridging urban-rural financial exclusion gaps. Over the few previous years, Indian financial sector has secured topmost position nationally and globally with the incorporation of technologies like Artificial intelligence in the financial sector.

By adopting AI driven technologies banks and fintech companies can offer advanced and innovative products, enhancing customer experience and however, AI/ML facilitates low-cost, scalable solutions such as digital lending platforms and mobile banking apps (PwC, 2019). These technologies enable better credit assessments and fraud detection, making it easier for underserved individuals and small businesses to access loans and other financial services (World Bank, 2020). For exploring the same this research work is an attempt to study about the present status of financial inclusion in India and to analyze the role of artificial Intelligence and fintech in promoting sustainable financial inclusion.

## LITERATURE REVIEW

The United Nations defines financial inclusion as the easy access to and usage of financial products and services delivered by financial institutions. Financial Inclusion has been identified as an enabler for 8 out of the 17 SDGs. Research from time to times has pinpointed out the significance of financial inclusion that is being affected and promoted by Artificial Intelligence and financial Technology (Fintech) in this digital world. With the emergence of nascent field Artificial intelligence there exists the additional field for exploring the concept of digital financial inclusion. For the same line extensive review of many research works in the form of literatures have been made which includes,

- **Mhlanga (2020)** with the help of research paper investigated the role of Artificial intelligence in digital financial inclusion. Findings of the Research documents that fintech companies are using AI and its various applications to have digital financial inclusion for low-income earners, the poor, women, youths and businesses in the financial market. The study also finds that AI has a strong influence on digital financial inclusion in areas related to risk detection, measurement and management. The study also finds that AI addresses the problem of information asymmetry, and support customers through chat-bots.
- **Kshetri (2021)** worked in area of financial inclusion show that fintech companies in developing countries are utilizing digital technologies to assess, evaluate and refine the creditworthiness of potential borrowers in new and innovative ways.
- **Demir et al. (2022)** explored the linkage between fintech, financial inclusion, and income inequality using data from the Global Findex survey data. using various measures of financial inclusion including owning an account at a bank, borrowing from a financial institution, and saving. the results shows that financial inclusion plays a crucial role in overcoming income inequality, helps to reduce inequality across all levels of the inequality distribution.
- **D Skandali, et al. (2023)** with the help of the study titled “Artificial Intelligent Applications in Enabled Banking Services: The Next Frontier of Customer Engagement in the Era of ChatGPT” and concluded that trust and happiness as the most significant variables impacting consumers' intention to use and purchase conversational AI banking apps. The research highlights the mediating role of consumers' perceived value in their willingness to accept and pay for AI banking apps, offering implications for financial institutions to enhance audit and advisory services, customer satisfaction, engagement, and competitiveness.
- **NITI Aayog (2023)** using the study in the area of Artificial intelligence and financial inclusion concluded that AI-based credit scoring enhances financial access for low-income individuals
- **Subramanian Shankar Iyer et al. (2025)** with the help of research paper Technology and AI-driven Financial Inclusion (Underdeveloped Region) concluded that while technology driven financial inclusion holds immense potential addressing regulatory gaps, improving digital literacy and ensuring fair AI practices are mandatory for sustainable and equitable financial empowerment.

## CONCEPTUAL FRAMEWORK

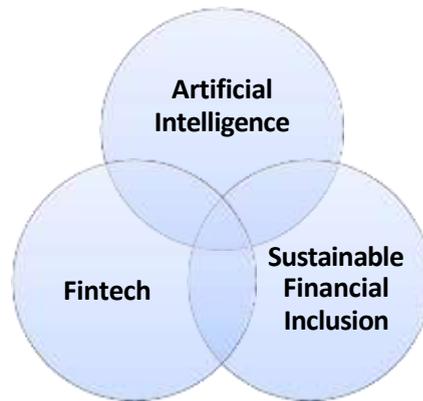
**Artificial Intelligence:** - Artificial intelligence (AI) is emerging technology that helps computers and machines to simulate human learning, comprehension, problem solving, decision making, creativity and autonomy. Artificial Intelligence creates big impact on Indian financial sector. To enhance simplify the functions and gain expertise in, financial operations new technology-based system like artificial intelligence using algorithms works as a key promoting factor.

**Fintech:-** Fintech refers to combination of technological innovations in the financial sector that enhance the way of providing financial services. The innovations typically include crowd funding, Insurtech, accounting and budgeting software, block chain technologies and crypto currencies, digital unified payments and settlements, and robo-advisors and online trading applications, helping to reduce costs and mitigate risks, and extending and broadening services to unbanked weaker sections of the society in both rural as well as urban area.

**Sustainable Financial Inclusion:** Financial inclusion is the process of ensuring access to financial services and timely and adequate credit where needed by vulnerable groups such as weaker sections and low-income groups at an affordable cost (*The Committee on Financial Inclusion Chairman: Dr.*

*C. Rangarajan (2008)*). The UN Sustainable development Goals includes inclusive economic growth, poverty reduction, and the promotion specific work to achieve sustainable development. Financial inclusion is known as a key enabler of sustainable development. Financial inclusion has the efficiency to effectively achieve these goals by providing access to financial resources like banking and financial services to the excluded population especially remote and rural areas of the country with which can then be used to invest in education, healthcare, and develop small businesses.

**Linking Artificial Intelligence, fintech and Sustainable financial inclusion:** -Artificial Intelligence, Fintech helps to enhance the financial inclusion, in getting regular banking services to all sections of the society. By using technology and data driven approaches Fintech can offer innovative, affordable, and tailored to the requirements of underserved peoples. Fintech delivers the financial services using different ways, like smart phones, digital platforms, and internet banking which help maximum people and business.



**Fig.1 Linkage between among Artificial Intelligence, fintech and Sustainable financial Inclusion**

#### **OBJECTIVES**

- To study about the present status of financial inclusion in India
- To identify the adoption of fintech for enhancing financial inclusion in India.
- To analyze the role of Artificial Intelligence and Fintech in Promoting Sustainable Financial Inclusion.

#### **RESEARCH METHODOLOGY**

This study utilizes a data that was mainly collected from secondary sources to assess the present status of financial inclusion in India focusing on role of artificial intelligence and fintech. the data was gathered from the sources such as, annual reports published by the central bank, department of financial services, and various reports of the government of India, that were tabulated, compared and checked year wise growth of financial inclusion with adoption of Artificial Intelligence enabled financial technologies in India.

#### **ANALYSIS & DISCUSSION**

This part of the research paper is based on the analysis and description of the data from various secondary sources that includes the progress of financial access and role of artificial intelligence and fintech in promoting sustainable financial inclusion in India.

**Financial Inclusion road map in India:** - Financial inclusion known as access and use of financial products and services like bank accounts, credit services, and insurance to everyone, living in the rural as well as urban regions of the country. Below table shows the various achievements of Indian banking sector in different phases.

**Table 1 Roadmap of Sustainable Financial Inclusion in India**

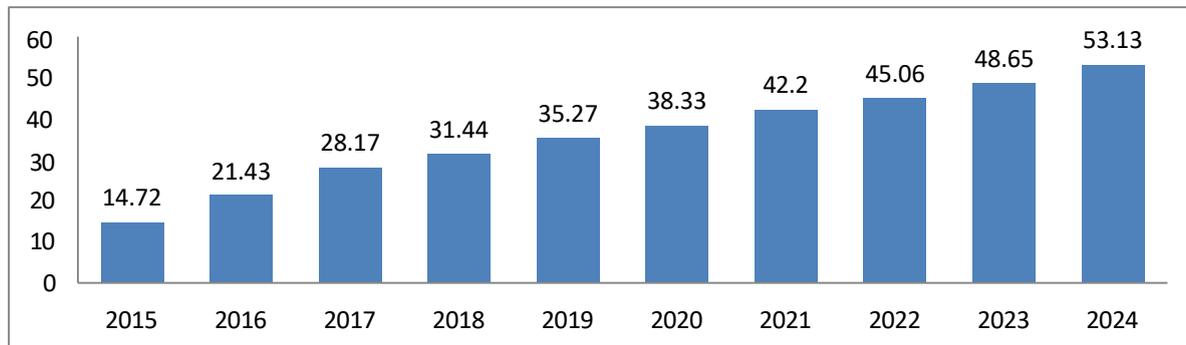
Phases	Year	Achievements of Financial Sector
Phase I (1960 – 1990)	1969	Nationalization of Banks, RRBs & NABARD
Phase II (1990 – 2005)	1992	SHG Programme, SIDBI
Phase III (2005 till Now)	2006	Framework of Financial Inclusion Committee AADHAR enabled DBT Services
	2014	PMJDY for promoting Financial Inclusion
	2015	MUDRA Scheme launched
	2019-2024	National Strategy for Financial Inclusion (NSFI)
	Up to 2030	Achievement of Financial inclusion via UN SDGs

Source: Compiled from annual report of RBI, and Department of financial services GOI

**PMJDY: National Mission for Financial inclusion**

Pradhan Mantri Jan Dhan Yojana (PMJDY) was launched on 2014 aimed to ensure comprehensive financial inclusion of all households in the country by providing universal coverage of banking facilities social security cover. India has made significant milestone in financial inclusion over the past few decades, particularly through initiatives like the Pradhan Mantri Jan Dhan Yojana (PMJDY). The total of 53.13 crore Jan-Dhan accounts have been opened till August 2024 under PMJDY, with a

deposit balance of ₹242,252.77 crore.



Source: Compiled from Progress report of PMJDY, Department of financial services GOI

**Financial Inclusion Index of the Central Bank**

RBI has announced the FI-Index with the purpose of capturing the coverage of financial inclusion across the country. FI has been measured as a comprehensive index, incorporating details of banking, investments, insurance, postal, as well as the pension sector, in consultation with government and respective sectoral regulators. It consists of three main parameters: Access (35%), Usage (45%), and Quality (20%).

Table 2-RBI's Financial Inclusion Index Progress for last four financial years

<i>Years</i>	<i>FI Index Score</i>
2021	53.9
2022	56.4
2023	60.1
2024	64.2

Source: RBI (<https://www.rbi.org.in/>)

### **Role of Fintech in sustainable Financial Inclusion**

In the era of digitalization financial institutions like banks through cost minimization and enhanced access to financial products and services for individuals in low-income people, especially in rural areas and other marginalized sectors of the Indian economy. Fintech platforms like M-banking apps, digital solutions, payment systems like plastic and UPI transactions, etc. overcomes the issues related to financial exclusion by providing convenient and accessible financial services to individuals over limited access to traditional banking infrastructure.

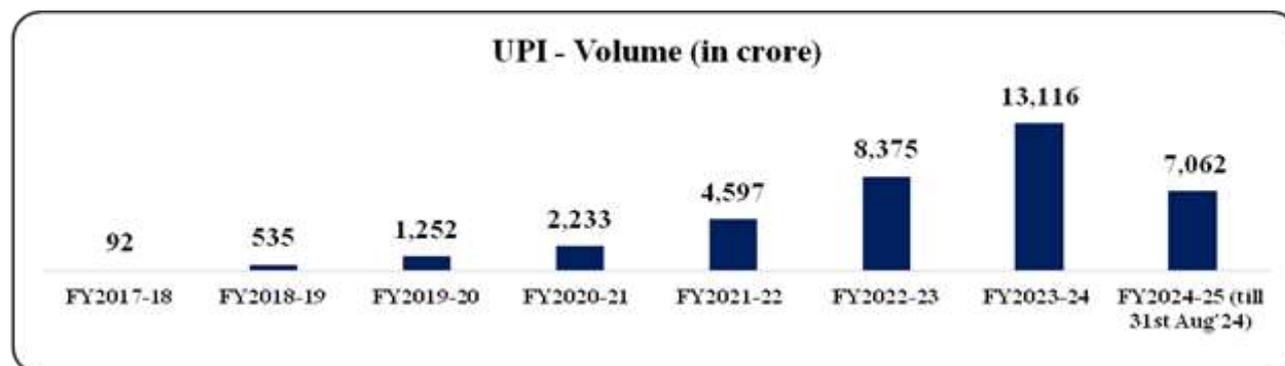
**Digital Payment Services:** - Digital payments services including Bharat Interface for Money- Unified Payments Interface, Real time gross settlement, Immediate Payment Service (IMPS), and National Electronic Toll Collection (NETC), fast tag have secured drastic growth and have changed the electronic payment ecosystem by increasing P2P as well as P2M payments services. Digital Payment services have grown from 2071 crore from financial year 2017-18 to 18737 crore in financial year 2023-24 and for the current Financial Year 2024-25, the transaction volume has reached 8658 crores.

Table 3- Growth of Digital Payment services (Volume Wise) financial years

<b>Financial Years</b>	<b>Growth of digital transactions (in crore)</b>
2017-18	2,071
2018-19	3,134
2019-20	4,572
2020-21	5,554
2021-22	8,840
2022-23	9,192
2023-24	18737
2024-25 (As on 31 Aug)	8658

Source: Reserve bank of India, NPCI data (2024-25)

**Acceleration of UPI transactions:** In recent years the unified payment interface system (UPI) becomes more convenient with fintech based solutions. COVID-19 pandemic is one of the great time that has boost FinTech services. Further, UPI remains the key enabler of India's digital payment ecosystem. UPI has enhanced digital payments in India, UPI transactions have grown from 92 crore from financial year 2017-18 to 13,116 crore in financial year 2023-24 and for the current Financial Year 2024-25, the transaction volume has reached 7,062 crores.



Source: Reserve bank of India, NPCI data (2024-25)

**Plastic card-based payment systems:** During the journey of digital payment system RuPay plastics card has also secured, significant position on the Indian retail payments. Presently all banks, including Private Sector Banks, Public Sector Banks, Small Finance Banks, Cooperative Banks and Regional Rural Banks, issues Ru Pay Cards to its bank customer

### Role of AI in Addressing Financial Inclusion

**Automated KYC Services** Artificial Intelligence and financial technologies (Fintech) have become ever- changing tools in addressing financial inclusion. AI also plays a crucial role in identity verification through biometric authentication (facial recognition, fingerprint scanning, identity verification technologies) to provide automated Know Your Customer (KYC) as Traditional KYC procedures, requiring huge paperwork and face- to-face interactions but AI and Fintech make it faster and more efficient. These systems can cross-check numerous data points in real-time, vastly improving accuracy. For example, initiatives like the Aadhaar enabled services in India use biometric, face and finger recognition and AI technologies also provide digital identities, allowing even the most marginalized individuals to access banking services.

**UPI and AI adoption:** The adoption of Artificial Intelligence (AI) with digital payment platforms, specially the UPI, has transformed India's financial services from the launch of UPI, has secured rapid grown till date The RBI has enhanced UPI with AI-driven payments, allowing users to conduct transactions with help of WhatsApp chat or instant messaging platforms.

**AI in Credit Risk Assessment and Loan Processing** AI-driven credit risk assessment has made data-driven faster, more accurate, loan process and. Traditional banking relied heavily on manual verification of credit worthiness but Artificial intelligence with the help of machine learning enables banks to analyze the customer transaction history, spending habits. Fintech companies like Paytm, phone pay, and google pay use AI to assess the creditworthiness of borrowers who may not have a formal credit history. This has improved financial inclusion by allowing quick approval of credit and with automated process.

**AI Chatbots for Personalized banking Services:** Artificial Intelligence (AI) is transforming the Indian banking services by enhancing working aspect, security, and customer service experience. For this purpose, AI- powered chat bots and virtual assistants widely used by the both public and private sector banks like SBI's SIA, HDFC Bank's EVA, and ICICI Bank's iPal, to provide services like entertaining customer queries, deliver transaction, and enhance engagement through personalized services. These AI-driven solutions have 24/7 customer support, reducing queue times and operational charges with improved overall quality of financial services.

**Fraud Detection and Prevention:**

With the invent of digital banking solutions, like AI and Fintech, fraud detection prevention has become a critical aspect. AI facilitates banks to detect fake attempts in live-time by analyzing bulk transaction of data. AI-driven fraud exposure systems adopt machine learning algorithms to monitor customer perception and detect anomalies, transaction amounts, Login attempts from unauthorized. Banks like SBI, ICICI Bank and Yes Bank has AI-related fraud detection tools to enhance cyber security, prevent phishing attacks, and secure transactions digitally.

**AI-powered digital lending Platforms:** Artificial intelligence-based loan platforms have emerged as a solution to sustainable financial inclusion in India, enabling access to loan services for individuals and businesses. These platforms use AI and Machine Learning programs to check the

creditworthiness using data sources, such as mobile usage patterns, transaction history and banking activity.

**Customized Savings and Investment Plans** AI also perform a crucial role in designing financial products tailored to the specific requirements of the customers. By analyzing saving and investment patterns, income aspects, and financial needs. AI algorithms create customized savings and investment plans that fulfill to the unique requirements of low-income population.

**FINDINGS**

The study is based on exploratory methodology that involves the description of various aspects related to artificial intelligence, fintech and its role in enhancing the access and reach of banking services in order to enhance coverage sustainable financial inclusion in the country. on the basis of the analysis major aspect of findings are

It can be interpreted from the data results that there is drastic growth in financial inclusion in India, from the Nationalization of banks in, RRBs & NABARD till achievement of financial inclusion via UN SDGs

RBI's Financial inclusion Index data shows the country's growth for the coverage of financial services across the country and it can be concluded from that FI's values has been increased in last 4 financial years for March 2024 was 64.2 as against 60.1 in March 2023.

The findings from the data of the PMJDY shows that total of 53.13 crore Jan-Dhan accounts have been opened till august 2024 under PMJDY, with a deposit balance of Rs.242,252.77 crore that is approximately 4 times of the data of FY 2015 (14.72 crore).

For the growth of Fintech services in India the data reveals that

Digital Payment services have grown from 2071 crore from financial year 2017-18 to 18737 crore in financial year 2023-24 and for the current Financial Year 2024-25, the transaction volume has reached 8658 crores.

UPI transactions have grown from 92 crore from financial year 2017-18 to 13,116 crore in financial year 2023- 24 and for the current Financial Year 2024-25, the transaction volume has reached 7,062 crores.

For the growth of sustainable financial inclusion in India artificial intelligence is addressing a significant contribution by providing services like Automated KYC Services, AI Based payment system using UPI, credit risk assessment and Loan Processing, AI based chat bots, AI for Fraud detection and prevention, AI-powered digital lending Platforms, Customized Savings and Investment Plans etc.

**CHALLENGES FOR ARTIFICIAL INTELLIGENCE & FINTECH:**

The integration of Artificial Intelligence (AI), Machine Learning (ML) and financial technology (Fintech) has been a game changer aspect for the Indian financial system but bringing maximum peoples under the coverage of financial products and services is the biggest key challenge. Some of the challenges that exist in India are social-cultural barriers, geographical locations, illiteracy level, no legal identity and gender biasness, limited infrastructure, lack of Income sources and regulatory frameworks are the main hurdles and challenges for sustainable financial inclusion in India.

## LIMITATIONS OF THE STUDY

The study based on available secondary data sources like RBI, and annual reports of ministry of financial services and the accuracy and completeness of the data may be subject to the limitations of the sources.

As the digital transformation such as Artificial Intelligence and fintech is rapidly affecting access to financial services. But this research work is based on the secondary data sources and does not include any primary sources and statistical test for analysis.

## CONCLUSION

The emergence of Artificial Intelligence, financial technologies (fintech) has become an engine of development, promising to expand affordable access to financial services and give a boost to financial inclusion defined as affordable access to basic financial products and services. As these technologies continue to progress in future. The combined efforts of regulatory bodies, government initiatives, and banks of public and private sector innovation will be key to realizing this vision, driving economic growth, and improving the lives of millions across the country. The Findings derived from the study concludes that India is in the progress stage for providing the artificial intelligence based financial services but still there is gap for achieving sustainable inclusive growth. Financial inclusion is an ongoing process. The PMJDY is the mega schemes of financial inclusion, the National strategy for financial inclusion (NSFI) and National Strategy for financial Education (NSFE), and many more schemes of the central bank have made financial access in India. The statistics presented in the paper also show a remarkable picture of financial inclusion in India and the government is working in the area of this to achieve new levels with the help of latest innovative technologies covering each and every region in the economy. It would surely help to fulfill the dream of sustainable financial Inclusion

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