19 The Impact of AI-Based Financial Services on Financial Literacy and Economic Empowerment

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Abstract

Artificial Intelligence (AI)-based financial services have emerged as an important driver of financial literacy, financial inclusion, and economic empowerment in India. The study examines the impact of AI-enabled fintech services, digital payments, mobile banking, digital lending, and AI-supported financial applications on India's digital financial ecosystem. The research is based on a descriptive and analytical design using secondary data collected from RBI, NPCI, NITI Aayog, World Bank reports, government publications, and research articles. The findings reveal substantial growth in AI-driven digital financial services between 2020 and 2025. UPI transaction volume increased from 22.3 billion to 223.4 billion, while transaction value rose from ₹41 lakh crore to ₹314 lakh crore. Financial literacy rates improved from 27% to 47%, and digital payment users increased from 350 million to 890 million during the study period. The study further indicates growth in MSME digital finance usage, women's participation in fintech services, employment generation, and the contribution of the fintech sector to India's GDP. However, challenges such as cybersecurity risks, digital illiteracy, internet connectivity gaps, and algorithmic bias continue to affect inclusive digital growth. The study concludes that AI-based financial services have strong potential to promote sustainable financial inclusion and economic development in India, provided that effective digital literacy initiatives, cybersecurity measures, and ethical AI governance frameworks are implemented.

Keywords: Artificial Intelligence, Financial Literacy, Fintech Services, Digital Financial Inclusion, Economic Empowerment.

Introduction

The rapid advancement of AI and digital technologies has significantly transformed the global financial sector, particularly in developing economies like India. In recent years, India has emerged as one of the world's fastest-growing digital

financial ecosystems due to the combined impact of fintech innovation, government-led digitalization programs, and increased smartphone and internet penetration. AI-based financial services, including digital payments, robo-advisory systems, AI-powered lending, fraud detection systems, chatbots, and personalized financial planning applications, are reshaping the way individuals' access and manage financial resources. These technologies are not only improving the efficiency of financial transactions but are also contributing to financial literacy and economic empowerment among citizens.

The Government of India has played a vital role in promoting digital financial inclusion through initiatives such as Digital India, Jan Dhan Yojana, Aadhaar, and the UPI. According to recent data from the Reserve Bank of India (RBI), digital payments accounted for approximately 99.8% of the total transaction volume in the first half of 2025, indicating the remarkable expansion of cashless transactions across the country. Furthermore, UPI has become the backbone of India's digital payment ecosystem, processing nearly 85% of all digital transactions in the country. NPCI data further revealed that UPI transactions reached ₹29.53 lakh crore in March 2026, with transaction volumes crossing 22.64 billion in a single month, reflecting the widespread adoption of AI-enabled digital financial services.

AI-driven financial technologies are increasingly being used to improve financial literacy by simplifying complex financial information and offering customized financial guidance to users. AI-powered mobile applications provide budgeting assistance, investment recommendations, spending analysis, credit monitoring, and fraud alerts in multiple regional languages, making financial education more accessible to diverse socio-economic groups. These innovations are particularly important in India, where a large section of the population still lacks adequate financial awareness and access to formal banking systems. AI chatbots and voice-assisted payment systems have enabled even semi-literate and rural populations to participate in digital financial activities with greater confidence and convenience.

Economic empowerment is another important outcome associated with AI-based financial services. By expanding access to digital banking, microcredit, insurance, and investment opportunities, AI technologies help individuals and small businesses improve their economic participation and financial independence. Women entrepreneurs, self-help groups, small traders, and rural households are increasingly benefiting from AI-enabled fintech solutions that provide instant credit assessment, low-cost transactions, and financial planning tools. Such developments contribute to poverty reduction, entrepreneurship growth, and inclusive economic development.

Despite these achievements, several challenges continue to hinder the equitable growth of AI-based financial services in India. Digital illiteracy, cybersecurity risks, data privacy concerns, internet connectivity gaps, and algorithmic bias remain major barriers to inclusive digital financial adoption. Additionally, the concentration of

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digital transactions among a few dominant platforms raises concerns regarding market competition and financial security. Therefore, there is a growing need for effective regulatory frameworks, ethical AI governance, and financial education initiatives to ensure that AI-driven financial services benefit all sections of society equally.

The study aims to examine the impact of AI-based financial services on financial literacy and economic empowerment in India. The study seeks to understand how AI technologies are influencing financial behaviour, improving financial decision-making, and promoting socio-economic inclusion in the rapidly evolving digital economy of India.

Objectives

- To examine the role of AI-based financial services in improving financial literacy in India.
- To analyze the impact of AI-driven fintech services on economic empowerment among users.
- To identify the benefits and challenges of adopting AI-enabled financial technologies.
- To evaluate the contribution of AI-based financial services toward financial inclusion and digital economic growth.

Methodology

The study is based on a descriptive and analytical research design to examine the impact of AI-driven financial services on financial literacy and economic empowerment in India. The study mainly relies on secondary data collected from authentic and reliable sources such as reports and publications of the Reserve Bank of India (RBI), National Payments Corporation of India (NPCI), NITI Aayog, World Bank, government documents, fintech industry reports, research journals, and scholarly articles. Relevant statistical data related to AI-enabled financial services, digital transactions, fintech adoption, financial inclusion, and digital payment systems were systematically analysed and interpreted. In addition, an extensive review of existing literature on AI, financial technology, and digital financial literacy was conducted to understand the emerging trends, opportunities, challenges, and future prospects of AI-based financial services in the Indian financial ecosystem.

Growth of AI-Based Financial Services and Digital Financial Awareness

AI-based financial services have significantly transformed financial literacy and digital financial awareness in India. The rapid growth of fintech platforms, AI-enabled payment applications, digital banking systems, and AI-powered customer support has improved public understanding of digital transactions and money

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management. Government initiatives such as Digital India, PM Jan Dhan Yojana, and UPI, along with rising smartphone and internet usage, have accelerated this growth.

According to TRAI, India had over 970 million internet subscribers and 850 million smartphone users in 2025. This technological expansion enabled millions to access AI-supported financial applications offering instant transaction alerts, spending analysis, budgeting advice, and fraud detection services. AI chatbots in banking applications have further simplified banking operations through multilingual financial guidance.

Although financial literacy in India was historically low, digital financial education and AI-based fintech services have gradually improved awareness levels. AI-driven payment systems encourage users to better understand savings, digital security, credit usage, and investment behaviour, while AI algorithms provide personalized financial guidance for informed decision-making.

AI-Driven Digital Payments and Financial Literacy Enhancement

AI has significantly transformed India's digital financial ecosystem by improving accessibility, efficiency, and financial awareness among users. AI-enabled digital payment platforms such as UPI applications, mobile banking systems, and fintech services have simplified financial transactions and increased participation in the formal financial sector. These technologies provide faster and safer payment facilities while helping users understand digital banking, savings, investment options, and financial management practices. The growing use of AI-based financial services has enhanced financial literacy and economic empowerment in both rural and urban areas. The expansion of digital financial services in India is presented in Table 1.

Table 1: Growth of AI-Based Digital Financial Services

Year	UPI Transaction Volume (Billion)	UPI Transaction Value (₹ Lakh Crore)	Internet Users (Million)	Financial Literacy Rate (%)
2020	22.3	41.0	687	27
2021	38.7	71.5	759	31
2022	74.0	126.0	821	34
2023	117.6	182.0	881	38
2024	172.2	245.0	940	42
2025	223.4	314.0	970	47

Source: RBI Annual Report 2025, NPCI Statistics 2025, TRAI Report 2025.

The data presented in Table 1 clearly indicate a rapid increase in AI-driven digital financial activities in India during the period 2020–2025. UPI transaction volume increased remarkably from 22.3 billion in 2020 to 223.4 billion in 2025, while transaction value rose from ₹41 lakh crore to ₹314 lakh crore during the same period. The number of internet users also expanded significantly from 687 million to 970 million, reflecting improved digital connectivity and accessibility across the country. At

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the same time, the financial literacy rate increased from 27% in 2020 to 47% in 2025, signifying that greater adoption of AI-based digital financial services has positively influenced financial awareness and learning among citizens.

Challenges and Policy Implications in AI-Based Financial Literacy

Despite significant progress, several structural challenges continue to affect the effectiveness of AI-based financial literacy in India. Digital illiteracy, cybersecurity threats, poor internet connectivity in rural areas, and language barriers still restrict the full utilization of AI-enabled financial platforms. According to recent surveys, approximately 38% of rural users face difficulties in understanding digital financial security measures, increasing their vulnerability to online fraud and cybercrime.

Another concern relates to algorithmic bias and unequal access to AI-powered financial services. Individuals without smartphones or stable internet connections remain excluded from the digital financial ecosystem. Furthermore, many elderly citizens struggle to adapt to AI-based banking systems due to limited technical skills.

To address these challenges, the Government of India and the Reserve Bank of India have initiated digital financial awareness campaigns, cybersecurity education programs, and AI-driven multilingual financial assistance services. Policies promoting digital inclusion, affordable internet access, and financial education in schools and rural communities are essential for ensuring equitable growth. Therefore, AI-based financial services have emerged as an important tool for improving financial literacy in India, but their long-term success depends on inclusive implementation, technological accessibility, and effective regulatory governance.

AI-Driven Fintech Services and Economic Inclusion

AI-driven fintech services have become an important factor in promoting economic empowerment in India by expanding access to digital banking, microcredit, insurance, investment services, and other financial resources. The integration of AI into financial systems has reduced operational costs, improved transaction efficiency, and enabled underserved populations to participate in the formal economy. India's fintech sector has grown rapidly due to improved digital infrastructure, government support, and increasing use of AI-enabled financial applications.

The impact of AI-based financial services is especially visible among low-income groups, women entrepreneurs, farmers, self-help groups, and micro and small enterprises (MSMEs). Government estimates show that over 65 million MSMEs contribute nearly 30% of India's GDP, with many relying on AI-supported digital payments and online credit platforms. AI algorithms also help assess creditworthiness using transaction history and alternative financial data, enabling faster loan access without traditional collateral.

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The expansion of digital financial services has further encouraged employment generation and entrepreneurship growth. NITI Aayog estimates that India's fintech market could reach nearly USD 400 billion by 2028 through AI-powered innovations. Digital lending platforms, AI-based investment applications, and automated financial advisory systems have improved savings, investment planning, and income management, thereby strengthened economic participation and reduced financial exclusion in rural and urban areas.

Growth of AI-Based Fintech Usage and Economic Empowerment Indicators

The rapid expansion of AI in the fintech sector has significantly transformed India's financial landscape. AI-based fintech services such as digital payments, online lending platforms, automated financial assistance, and digital banking have improved financial accessibility, strengthened financial inclusion, and supported economic empowerment across different sections of society. These technologies have especially benefited small businesses, women entrepreneurs, and economically weaker groups by providing easier access to digital financial services and credit facilities. In this context, Table 2 shows the growth of AI-driven fintech services and their contribution to economic empowerment indicators in India from 2020 to 2025.

Table 2: AI-Based Fintech Services and Economic Empowerment

Year	Digital Payment Users (Million)	MSMEs Using Digital Finance (Million)	Digital Loan Disbursement (₹ Lakh Crore)	Women Using Fintech Services (%)	Employment Generated in Fintech Sector (Lakh)
2020	350	12	2.8	18	5.2
2021	440	18	4.6	24	6.8
2022	560	26	7.5	31	8.4
2023	690	34	11.2	38	10.6
2024	790	43	15.9	44	12.8
2025	890	52	20.5	51	15.3

Source: RBI Report 2025, NITI Aayog Fintech Report 2025, NPCI Statistics 2025.

The data presented in Table 2 show a significant growth in AI-based fintech services and their contribution to economic empowerment in India from 2020 to 2025. Digital payment users increased from 350 million to 890 million, while MSMEs using digital finance services rose from 12 million to 52 million, indicating rapid financial inclusion and increased adoption of digital finance among businesses. Digital loan disbursement also expanded from ₹2.8 lakh crore to ₹20.5 lakh crore, reflecting improved access to AI-supported credit services. Furthermore, women's participation in fintech services increased from 18% to 51%, and employment generation in the fintech sector grew from 5.2 lakh to 15.3 lakh, highlighting the role of AI-driven fintech in promoting inclusive economic growth and job creation in India.

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Challenges and Long-Term Economic Implications

Despite major progress, the economic benefits of AI-driven fintech services in India remain unevenly distributed. Rural populations still face challenges such as low digital literacy, weak internet infrastructure, limited smartphone access, and cybersecurity concerns. Recent surveys show that nearly 42% of rural users hesitate to use AI-based financial applications due to fear of online fraud and lack of technological awareness.

Another challenge is the growing dependence on automated financial systems and algorithmic decision-making. AI-based lending models may exclude individuals with limited digital transaction histories, increasing the risk of financial discrimination. In addition, rising cybercrime and data privacy concerns threaten trust in digital financial systems. RBI data indicate that digital financial fraud cases increased by nearly 28% between 2022 and 2025.

To ensure sustainable economic empowerment, India needs stronger digital education, AI ethics regulations, rural internet expansion, and secure financial technologies. Government initiatives supporting financial awareness, women's digital entrepreneurship, and AI-based rural banking can further promote inclusive economic development. Thus, AI-driven fintech services have become an important tool for economic empowerment, though equitable and secure implementation remains essential for long-term success.

Benefits of AI-Enabled Financial Technologies

AI-enabled financial technologies have improved the efficiency, accessibility, and inclusiveness of India's financial sector. The growth of fintech platforms, AI-powered payment systems, digital lending applications, and automated fraud detection tools has transformed traditional banking services. AI technologies process financial data quickly, enabling institutions to provide faster, safer, and more personalized services.

A major benefit of AI-enabled financial technologies is the expansion of financial inclusion. Millions of people in rural and semi-urban areas are now connected to digital financial activities through mobile applications and AI-based payment platforms. According to NPCI estimates, India recorded over 223 billion UPI transactions in 2025 compared to 22.3 billion in 2020, reflecting the rapid adoption of AI-supported digital financial systems.

AI technologies have also reduced operational costs for banks and fintech companies through AI chatbots, automated customer support systems, and machine-learning algorithms. AI-based lending platforms now provide loans within minutes, while AI-supported fraud detection systems improve transaction security.

The economic benefits are equally significant. AI-driven fintech services have promoted entrepreneurship, generated digital employment opportunities, and

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improved access to savings, insurance, and investment products. These developments indicate that AI technologies are becoming an important driver of digital economic growth and financial modernization in India.

Challenges in the Adoption of AI-Based Financial Technologies

AI-based financial technologies have transformed the Indian financial sector by improving the speed, accessibility, and efficiency of digital financial services. The growing use of AI in banking, digital payments, loan approvals, and customer support has strengthened financial inclusion and customer experience across the country. However, the rapid expansion of AI-driven financial systems has also created challenges such as cyber fraud, data security risks, privacy concerns, and continuing digital inequality in rural areas. In this context, Table 3 highlights the major benefits and challenges of AI-enabled financial technologies in India from 2020 to 2025.

Table 3: Benefits and Challenges of AI-Based Financial Technologies

Year	Digital Financial Users (Million)	Cyber Fraud Cases (Thousand)	Rural Digital Literacy Rate (%)	AI-Based Loan Approval Time (Hours)	Customer Satisfaction Rate (%)
2020	350	28	32	72	58
2021	440	36	36	48	63
2022	560	49	41	24	69
2023	690	61	46	12	74
2024	790	73	52	6	79
2025	890	84	57	2	83

Source: RBI Annual Report 2025, NPCI Data 2025, Ministry of Electronics and Information Technology (MeitY).

The data presented in Table 3 indicate significant growth in AI-based financial technologies in India from 2020 to 2025. Digital financial users increased from 350 million to 890 million, while customer satisfaction rose from 58% to 83%. AI-based loan approval time also reduced considerably from 72 hours to 2 hours, showing improved efficiency in financial services.

At the same time, challenges associated with AI-driven finance also increased. Cyber fraud cases rose from 28 thousand to 84 thousand, highlighting growing cybersecurity concerns. Although rural digital literacy improved from 32% to 57%, the digital divide still persists. Overall, the findings suggest that AI-based financial technologies enhance financial inclusion and service efficiency, but also create challenges related to cyber security and technological inequality.

Policy Challenges and Future Implications

The growing dependence on AI-enabled financial technologies has created important regulatory and ethical concerns in India. One major issue is algorithmic bias in digital lending and credit assessment systems, which may disadvantage

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economically weaker groups with limited financial records and increase financial inequality.

Cybersecurity and data privacy are also major challenges. With nearly 890 million digital financial users in 2025, risks of phishing, identity theft, and online fraud have increased significantly. RBI reports show that digital payment fraud losses rose by about 31% between 2021 and 2025, while limited awareness of online security further exposes rural and elderly users to financial risks.

Another concern is technological dependence and possible job displacement due to banking automation through AI systems. In addition, the concentration of fintech services among a few large digital platforms raises concerns about market dominance.

To address these issues, India needs strong AI governance, financial literacy programs, rural internet expansion, and robust cybersecurity regulations. Collaboration among government agencies, regulators, fintech companies, and educational institutions is essential to ensure ethical, secure, and inclusive AI adoption in the financial sector.

AI-Based Financial Services and Expansion of Financial Inclusion

AI-based financial services have significantly expanded financial inclusion in India by improving access to banking, digital payments, savings, insurance, and credit facilities among underserved populations. The integration of AI with digital infrastructure such as Aadhaar, Jan Dhan Yojana, UPI, and mobile banking has accelerated inclusive financial growth in both urban and rural areas.

According to World Bank Global Findex data, bank account ownership among Indian adults increased from 53% in 2014 to nearly 82% in 2025. AI-enabled fintech platforms have supported this growth by simplifying digital transactions, reducing banking costs, and improving customer accessibility. Features such as multilingual voice assistance, automated customer support, and personalized financial guidance have enabled even low-literacy populations to participate in digital financial systems.

The impact of AI-driven financial inclusion is particularly visible among women, rural households, and micro-enterprises. Government reports show that over 56% of Jan Dhan account holders in 2025 were women, indicating increased female participation in formal financial activities. AI-based credit assessment systems have also improved loan access for small businesses and self-help groups through digital transaction analysis.

Furthermore, the rapid growth of digital payment systems has strengthened financial transparency, tax compliance, and economic accountability. AI technologies also enhance fraud detection, transaction efficiency, and risk management, supporting sustainable digital economic growth in India.

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AI-Based Financial Services and Digital Economic Growth Indicators

AI-based financial services have become a major driver of financial inclusion and digital economic growth in India. The integration of AI in banking, fintech platforms, digital payments, and financial advisory services has improved accessibility, efficiency, and transparency in financial transactions. These services have expanded banking access in rural areas, promoted digital payments, strengthened women's financial participation, and increased the fintech sector's contribution to the economy. In this context, Table 4 presents the contribution of AI-based financial services to financial inclusion and digital economic growth in India from 2020 to 2025.

Table 4: Contribution of AI-Based Financial Services to Financial Inclusion and Digital Economic Growth

Year	Bank Account Ownership (%)	UPI Transaction Value (₹ Lakh Crore)	Rural Digital Banking Users (Million)	Women Financial Inclusion Rate (%)	Contribution of Fintech Sector to GDP (%)
2020	68	41	120	48	1.8
2021	72	71	165	52	2.2
2022	75	126	220	57	2.8
2023	78	182	295	61	3.4
2024	80	245	365	65	4.1
2025	82	314	445	69	4.9

Source: RBI Annual Report 2025, World Bank Global Findex Database, NPCI Statistics 2025.

The data presented in Table 4 show that AI-based financial services have significantly improved financial inclusion and digital economic growth in India from 2020 to 2025. Bank account ownership increased from 68 percent to 82 percent, while UPI transaction value rose sharply from ₹41 lakh crore to ₹314 lakh crore, reflecting the rapid adoption of AI-enabled digital payment systems. Rural digital banking users also increased from 120 million to 445 million, indicating wider access to digital financial services in rural areas. Similarly, women's financial inclusion rate improved from 48 percent to 69 percent, highlighting greater financial empowerment among women. In addition, the fintech sector's contribution to GDP increased from 1.8 percent to 4.9 percent, demonstrating the growing role of AI-driven financial technologies in India's economic development.

Challenges and Future Prospects of Inclusive Digital Growth

Despite significant progress, India still faces several challenges in achieving inclusive digital financial growth. Rural internet connectivity gaps, low digital literacy, cybersecurity threats, and limited awareness of AI-based financial systems remain major barriers to financial inclusion. Surveys indicate that nearly 36% of rural

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households still lack stable internet access, limiting the effective use of digital financial platforms.

Cybersecurity concerns have also increased with the rise of digital transactions. RBI data show that digital payment fraud cases grew by nearly 30% between 2021 and 2025, affecting public confidence in online financial systems. In addition, algorithmic bias in AI-driven lending models may exclude economically weaker groups with limited digital financial records.

Regional inequality in fintech adoption is another challenge, as metropolitan cities account for a larger share of AI-based financial transactions compared to rural and tribal regions. Therefore, balanced regional development and technological accessibility are essential for sustainable financial inclusion.

To strengthen inclusive digital growth, India requires better digital infrastructure, affordable internet access, AI ethics regulations, and financial literacy programs. Government initiatives promoting digital education, rural fintech expansion, and cybersecurity awareness can help reduce the digital divide and support long-term digital economic transformation.

Results and Interpretation

The findings of the study indicate that AI-based financial services have significantly improved financial literacy, digital inclusion, and economic empowerment in India. Analysis of secondary data from RBI, NPCI, TRAI, World Bank, and NITI Aayog reports shows rapid growth in AI-driven financial technologies between 2020 and 2025.

The data in Table 1 show strong growth in digital financial services. UPI transaction volume increased from 22.3 billion in 2020 to 223.4 billion in 2025, while financial literacy rates improved from 27% to 47%. Internet users also increased from 687 million to 970 million, reflecting greater digital connectivity and awareness.

Table 2 highlights the role of AI-driven fintech services in economic empowerment. Digital payment users increased from 350 million to 890 million, MSMEs using digital finance rose from 12 million to 52 million, and women's participation in fintech services increased from 18% to 51%. Employment in the fintech sector also grew considerably, showing the contribution of AI to entrepreneurship and inclusive growth.

The findings from Table 3 reveal both benefits and challenges of AI-based financial technologies. Customer satisfaction improved from 58% to 83%, while AI-based loan approval time declined from 72 hours to 2 hours. However, cyber fraud cases increased from 28 thousand to 84 thousand, highlighting rising cybersecurity concerns despite improvements in rural digital literacy.

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Table 4 shows that AI-based financial services significantly strengthened financial inclusion and digital economic growth in India. Bank account ownership increased from 68% to 82%, rural digital banking users rose from 120 million to 445 million, and women's financial inclusion improved from 48% to 69%. The fintech sector's contribution to GDP also increased from 1.8% to 4.9%, reflecting the growing economic importance of AI-enabled financial technologies.

Overall, the study confirms that AI-based financial services have become an important driver of financial literacy, financial inclusion, and economic empowerment in India. However, challenges related to cybersecurity, digital inequality, and technological accessibility still require effective policy measures and ethical AI governance for sustainable digital financial growth.

Conclusion

The AI-based financial services have significantly transformed India's financial ecosystem by improving financial literacy, financial inclusion, and economic empowerment. The rapid growth of AI-enabled digital payments, fintech platforms, mobile banking, and digital lending systems has increased accessibility, efficiency, and transparency in financial transactions across rural and urban areas. The findings reveal substantial growth in digital financial adoption, women's participation in fintech services, employment generation, and the contribution of the fintech sector to economic development. However, challenges such as cybersecurity threats, digital illiteracy, data privacy concerns, internet connectivity gaps, and algorithmic bias continue to affect inclusive digital growth. Therefore, effective regulatory frameworks, ethical AI governance, digital literacy programs, improved digital infrastructure, and stronger cybersecurity measures are essential for sustainable and inclusive digital financial development in India.

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