

IMPACT OF DIGITAL TECHNOLOGY ON FINANCIAL INCLUSION AND ECONOMIC GROWTH IN INDIA

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ABSTRACT

Digital technology has emerged as a transformative force in reshaping financial systems across developing economies, particularly in India. Over the past decade, India has experienced an unprecedented expansion of digital public infrastructure that integrates identity systems, banking access, and real-time payment platforms. This study examines the impact of digital technology on financial inclusion and its subsequent influence on economic growth in India. The research analyses how technological integration into financial services has reduced transaction costs, expanded access to formal banking, improved capital mobilization, and strengthened economic formalization. Using secondary data from institutional reports and macroeconomic indicators, the study evaluates the structural relationship between digital financial expansion and GDP growth trends. The findings suggest that digital technology enhances economic efficiency, promotes entrepreneurship, increases fiscal transparency, and strengthens the resilience of the financial system. However, structural constraints such as digital inequality, cybersecurity vulnerabilities, and financial literacy gaps remain critical challenges. The study concludes that digital financial inclusion in India has evolved into a foundational pillar of inclusive economic development, with long-term growth implications.

Keywords: Digital Technology, Financial Inclusion, Economic Growth, Digital Payments, Financial Development, India

1. INTRODUCTION

Financial inclusion is an important component of inclusive economic development. Access to formal financial services enables individuals and businesses to save money securely, obtain credit, manage financial risks, and participate in economic activities. In India, despite the expansion of banking services, many rural communities, low-income households, and informal-sector workers have faced difficulties accessing formal financial facilities due to geographical barriers, limited banking infrastructure, and low financial awareness. The development of digital technology has created new opportunities to overcome these challenges. The expansion of internet connectivity, smartphones, digital banking, and electronic payment systems has transformed India's financial sector. Initiatives such as the Pradhan Mantri Jan Dhan Yojana (PMJDY) have expanded access to basic banking services, while the Unified Payments Interface (UPI), developed by the National Payments Corporation of India, has made digital transactions faster and more convenient. These developments have contributed to the growth of India's digital financial ecosystem and improved opportunities for accessing financial services.

Digital financial services may support economic growth by reducing transaction costs, improving payment efficiency, encouraging savings, and facilitating business activities. They can also help small enterprises participate in formal economic activities and improve access to financial resources. However, challenges such as limited digital literacy, unequal internet access, and cybersecurity risks may restrict the benefits for certain population groups.

In this context, the present study examines the relationship between digital technology, financial inclusion, and economic growth in India. It focuses on trends in digital payments and financial inclusion initiatives, particularly PMJDY, to understand their potential contribution to economic development. Using secondary data and descriptive analysis, the study explores these developments while recognising that economic growth is influenced by several factors and that observed trends alone cannot establish a direct causal relationship.

2. LITERATURE REVIEW

1. **Ozili (2018):** Ozili examined the role of digital finance in financial inclusion and financial stability, particularly in developing and emerging economies. The study discussed the potential benefits of digital financial services for individuals, businesses, governments,

and the economy. It also highlighted issues relating to financial risks, consumer protection, and financial stability. The study emphasised that the benefits of digital finance need to be considered alongside the risks associated with its adoption.

2. **Suri and Jack (2016):** Suri and Jack investigated the long-term poverty and gender impacts of mobile money in Kenya. Their study found that access to the M-PESA mobile money system was associated with increased per-capita consumption and reduced poverty. The reported effects were more pronounced among female-headed households and were linked to changes in savings behaviour, financial resilience, and occupational choices. Although the study was conducted in Kenya, it provides evidence of how digital financial services may influence household welfare and economic participation. Its findings should be interpreted in the context of the Kenyan financial system.

3. **Demirgüç-Kunt et al. (2022):** The World Bank's Global Findex Database 2021 examined financial account ownership, digital payments, and financial resilience across countries. The report highlighted progress in access to financial services while identifying continuing differences among population groups, including women, poorer individuals, and people with lower levels of education. It also examined the use of accounts for payments, savings, and borrowing. The report indicates that financial inclusion should be assessed not only through account ownership but also through the actual use of financial services.

4. **Rastogi et al. (2021):** Rastogi and colleagues examined the relationship between the Unified Payments Interface (UPI), financial literacy, financial inclusion, and economic development in India. Their study used questionnaire-based data and structural equation modelling to analyse relationships among these factors. The findings indicated that UPI was related to financial literacy, while financial literacy was related to financial inclusion and financial inclusion to economic development. This research provides an Indian perspective on the potential links between digital payment systems and broader financial participation.

5. **Pradhan et al. (2021):** Pradhan and colleagues investigated the relationship between financial inclusion, information and communication technology (ICT) development, and economic growth across 20 Indian states during 1991–2018. Using Granger-causality techniques, the study examined short-run and long-run relationships among these variables and reported evidence of temporal causal relationships. The findings highlight the importance of considering financial inclusion, ICT infrastructure, and economic growth within a common analytical framework. However, the study covers an earlier period and uses an empirical approach different from the descriptive methodology adopted in the present research.

6. **Haque et al. (2025):** Haque and colleagues examined UPI adoption and financial inclusion in rural India using primary data collected from rural areas of Aligarh district. The study used logistic regression to analyse the socioeconomic characteristics associated with UPI usage. The findings identified age, gender, education, occupation, and income among the factors associated with adoption. As the research focused on a specific district, its findings provide localised evidence rather than a complete picture of digital payment adoption across India.

2.1 RESEARCH GAP

The existing literature provides substantial evidence regarding the role of digital technology in promoting financial inclusion and economic development. Previous studies have examined various aspects of digital finance, including mobile money, UPI adoption, fintech services, ICT infrastructure, and access to formal banking. However, many studies focus on specific technologies, individual states, rural communities, or household-level samples rather than examining the broader digital financial ecosystem in India. Furthermore, financial inclusion and economic growth are often investigated separately, creating a need for an integrated assessment of digital payment transactions, the expansion of bank accounts, and their potential relationship with economic development. The rapid expansion of India's digital payment infrastructure, particularly since 2016, also highlights the importance of examining recent trends using available national-level data. In addition, challenges such as digital inequality, gender disparities, limited financial literacy, cybersecurity risks, and unequal access to digital infrastructure continue to affect the benefits of digital financial services. Therefore, the present study attempts to address these research needs by analysing secondary data on digital payment transactions and financial inclusion initiatives, particularly the Pradhan Mantri Jan Dhan Yojana (PMJDY), and examining the potential channels through which digital financial inclusion may contribute to economic growth in India. The study provides an integrated descriptive perspective on these relationships while recognising that descriptive trends alone cannot establish a definitive causal relationship.

3. OBJECTIVES OF THE STUDY

1. To examine the role of digital technology in expanding financial inclusion in India.
2. To analyse the growth and development of digital payment systems in India, particularly the expansion of UPI and other digital transactions.
3. To examine trends in financial inclusion through initiatives such as the Pradhan Mantri Jan Dhan Yojana (PMJDY).
4. To analyse the potential channels through which digital financial inclusion may contribute to economic growth, including savings mobilisation, credit access, transaction efficiency, economic formalisation, and entrepreneurship.
5. To identify the major challenges associated with digital financial inclusion, particularly digital inequality, gender disparities, financial literacy gaps, and cybersecurity risks.

6. To develop an integrated conceptual understanding of the relationship between digital technology, financial inclusion, and economic growth in India using secondary data and descriptive analysis.

4. MATERIALS AND METHODS

The study adopts a descriptive and analytical research design based on secondary data sources. Data have been collected from annual reports, economic surveys, payment system statistics, and institutional publications. Key data sources include publications of the Reserve Bank of India, National Payments Corporation of India, World Bank reports, and Government of India economic documents. The period of analysis focuses primarily on the post-2016 phase, during which digital payment adoption accelerated significantly. This period captures structural shifts in transaction behaviour, financial access expansion, and digital infrastructure consolidation.

The analytical framework of the study is based on three structural channels through which digital technology influences economic growth. First, digital inclusion improves capital mobilization by integrating savings into formal financial systems. Second, digital transactions reduce transaction costs and enhance operational efficiency. Third, digital formalization increases fiscal transparency and improves resource allocation.

Trend analysis has been used to examine the growth of digital transactions, expansion of bank account ownership, and macroeconomic performance indicators such as GDP growth rates. Rather than relying solely on statistical correlation, the study emphasizes structural interpretation to identify causal linkages.

4.1 DIGITAL TECHNOLOGY AND EXPANSION OF FINANCIAL INCLUSION

Digital infrastructure has substantially reduced barriers to financial participation in India. Electronic Know Your Customer procedures and mobile banking services have simplified account opening and expanded outreach beyond physical branch limitations, particularly in semi-urban and rural areas.

The rapid growth of real-time digital transactions reflects a shift from cash-based systems to electronic payments. Small vendors and informal workers increasingly use digital platforms, generating financial records that improve credit assessments and expand access to formal lending. Additionally, direct benefit transfers through digital accounts have enhanced welfare delivery by reducing leakages and ensuring timely support.

Financial inclusion today extends beyond account ownership to active usage, indicating a transition from mere access to meaningful financial participation.

4.2 DIGITAL FINANCIAL INCLUSION AND ECONOMIC GROWTH

The impact of digital technology on economic growth is mediated through multiple structural channels. First, digital platforms enhance savings mobilization by integrating previously unbanked individuals into formal financial systems. Increased deposit flows expand the lending capacity of financial institutions, supporting investment and entrepreneurship.

Second, digital payments improve transaction efficiency. Real-time settlements reduce working capital constraints for businesses, particularly micro and small enterprises. Faster turnover and improved liquidity management enhance productivity and profitability.

Third, digital formalization expands the taxable economic base. As transactions become traceable, tax compliance improves, strengthening government revenue capacity. Enhanced fiscal space enables public investment in infrastructure, health, and education, reinforcing long-term growth.

Fourth, digital financial ecosystems foster innovation. Fintech enterprises leverage digital infrastructure to develop credit scoring models, micro-lending platforms, and digital insurance products. These innovations contribute to employment generation and sectoral diversification. Collectively, these mechanisms indicate that digital technology contributes to economic growth not as a direct causal variable but as a structural enabler enhancing financial intermediation efficiency.

5. RESULT AND DISCUSSION

The analysis reveals that digital technology has significantly expanded financial inclusion in India. The growth in digital payment transactions reflects a behavioural shift from cash-based transactions to electronic platforms. Real-time interoperable payment systems have enabled even small vendors and informal workers to participate in formal financial channels. This shift reduces transaction friction, improves settlement speed, and enhances liquidity circulation.

The expansion of bank account ownership under digital inclusion initiatives has created a foundational layer for financial participation. However, the more significant development lies in increased account usage. Digital payments, direct benefit transfers, and mobile banking have ensured that financial accounts are actively utilized rather than remaining dormant. This transition from access to usage marks a qualitative improvement in financial inclusion.

From a macroeconomic perspective, digital financial inclusion contributes to economic growth through multiple mechanisms. Increased savings mobilization strengthens the deposit base of banks, enabling expanded credit disbursement to productive sectors. Enhanced credit access particularly benefits micro, small, and medium enterprises, which constitute a substantial portion of India's economic output. Improved credit allocation efficiency increases productivity and supports employment generation.

Digital payment systems also enhance transactional transparency. As economic exchanges become traceable, tax compliance improves and the informal economy gradually integrates into the formal sector. Increased fiscal capacity enables higher public investment in infrastructure and social development, reinforcing long-term growth prospects.

Furthermore, digital platforms foster innovation ecosystems. Fintech enterprises leverage digital public infrastructure to offer micro-lending, digital insurance, and small-scale investment products. These services broaden financial access and stimulate entrepreneurial activity. The multiplier effect of such innovation extends beyond the financial sector into manufacturing, services, and retail trade. However, the study also identifies structural challenges. Digital inequality remains a concern, particularly in rural and economically weaker regions where internet connectivity and smartphone penetration are comparatively lower. Gender disparities in digital access further limit inclusive outcomes. Cybersecurity threats pose risks to trust in digital platforms, and financial literacy gaps may hinder optimal usage. Despite these challenges, the overall findings suggest a positive structural relationship between digital technology expansion and economic growth. While GDP growth is influenced by multiple variables including global economic conditions and fiscal policy, the alignment between digital expansion and economic stabilization indicates meaningful linkage. Digital financial inclusion has evolved from a social policy tool into a macroeconomic growth driver by improving efficiency, transparency, and productivity.

Table 1: Growth of Digital Payment Transactions in India (2017–2025)

Year	Total Digital Transactions (Billion)	UPI Transactions (Billion)	Growth Rate (%)
2017–18	20.71	0.9152	106
2018–19	23.4	5.35	168
2019–20	34.70	12.519	48.3
2020–21	43.7	22.28	87
2021–22	71.98	45.973	64.7
2022–23	89.5	83.76	105
2023–24	118.2	117.64	59
2024–25	228.31	185.87	21.8

Source: Compiled from NPCI and RBI Annual Reports.

Table 1 shows a rapid and continuous increase in digital payment transactions in India between 2017 and 2025. The data indicates that UPI transactions, which were negligible in the initial phase, grew exponentially over the years and became the dominant digital payment mode. The consistent rise reflects a structural shift from cash-based transactions to digital platforms. This sustained growth suggests that digital payments are now deeply integrated into everyday economic activities, supporting financial formalization and efficiency.

Table 2: Expansion and Deepening of Financial Inclusion under PMJDY in India, 2017–2025

Year / Reporting Date	PMJDY Accounts (Million)	Deposits in PMJDY Accounts (₹ Billion)	Women Account Holders (%)	Rural/Semi-Urban Accounts (%)
March 2017	281.7	629.72	51.4	59.9
March 2018	314.4	784.94	52.8	58.9
March 2019	352.7	961.07	53.1	59.3
March 2020	383.3	1,184.34	53.4	59.0
March 2021	422.0	1,455.51	55.4	66.0
March 2022	450.6	1,664.59	55.7	66.7
March 2023	486.5	1,988.44	55.6	66.7
March 2024	519.5	2,325.02	55.6	66.6
March 2025	551.7	2,603.87	55.7	66.6

Source: Department of Financial Services, Ministry of Finance, Government of India, PMJDY progress data and annual reports. Percentages for women and rural/semi-urban accounts are calculated from the official account-count data.

Table 2 demonstrates the expansion and deepening of financial inclusion in India through the Pradhan Mantri Jan Dhan Yojana (PMJDY). The number of PMJDY accounts increased from 281.7 million in March 2017 to 549.7 million by March 2025, while deposits

increased from ₹629.72 billion to ₹2,603.87 billion during the corresponding period. The growing participation of women and the substantial share of rural and semi-urban accounts indicate that the expansion of financial inclusion has extended beyond account creation to broader participation among historically underserved sections of the population. These trends support the argument that digital financial infrastructure and government-led financial inclusion initiatives have strengthened access to and participation in the formal financial system.

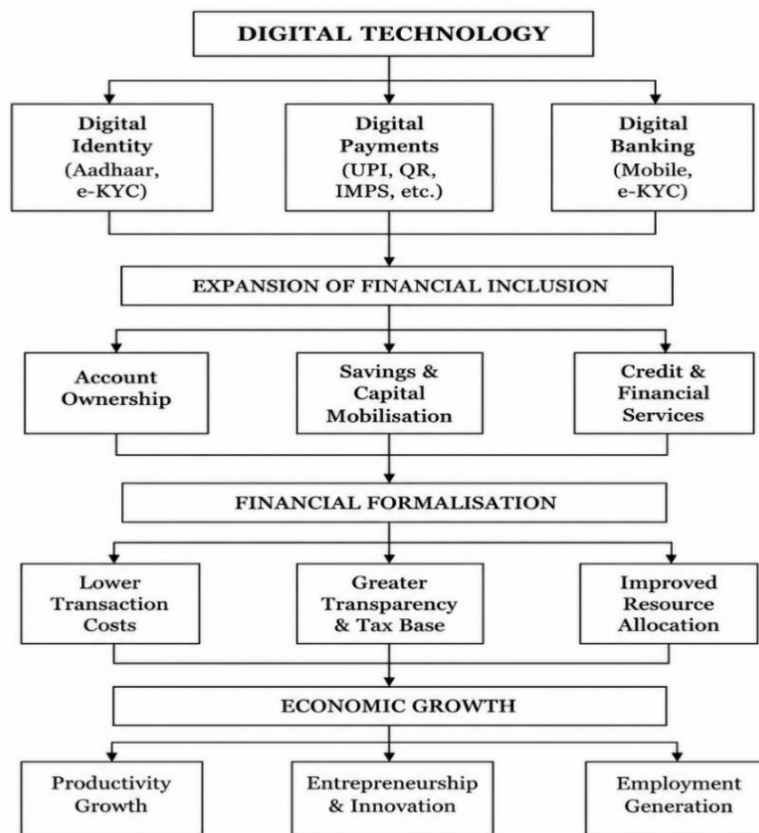


Figure 1: Conceptual Framework Linking Digital Technology, Financial Inclusion and Economic Growth in India

Figure 1 illustrates the proposed relationship between digital technology, financial inclusion, and economic growth. Digital identity systems, digital payment platforms, and digital banking services constitute the primary technological mechanisms through which individuals and businesses can access and use formal financial services. These technologies contribute to the expansion of financial inclusion by facilitating account ownership, savings mobilisation, and access to credit and other financial services.

The expansion of financial inclusion can further promote financial formalisation by lowering transaction costs, increasing transparency, broadening the tax base, and improving the allocation of financial resources. These outcomes create an enabling environment for economic growth by supporting productivity enhancement, entrepreneurship and innovation, and employment generation. The framework therefore suggests that the contribution of digital technology to economic growth is not necessarily direct; rather, financial inclusion and financial formalisation act as important channels through which digital transformation can produce wider economic benefits.

6. LIMITATION OF STUDY

The present study has certain limitations that should be considered while interpreting its findings. First, the research is based entirely on secondary data obtained from institutional reports, government publications, payment-system statistics, and other published sources; therefore, it does not include primary information collected directly from users of digital financial services. Second, the study primarily adopts a descriptive and trend-based research methodology and does not employ an econometric model to establish a definitive causal relationship between digital financial development and economic growth. Third, differences in the definitions, coverage, availability, and reporting frequency of indicators across institutions and time periods may affect the comparability and interpretation of the data. Fourth, the use of national-level data may conceal variations across states, rural and urban areas, income groups, and gender categories, meaning that the findings may not reflect the experiences of all population groups equally. Fifth, economic growth is influenced by several factors, including investment, government expenditure, international economic conditions, productivity, employment, inflation, and monetary and fiscal policies; consequently, changes in digital financial indicators alone cannot fully explain changes in GDP. Finally, digital financial technologies, regulatory frameworks, infrastructure, and user behaviour continue to evolve. Therefore, the findings should be interpreted in the context of the period covered by the available data and may require further investigation using updated data and more advanced analytical methods.

7. CONCLUSION

The findings of this study demonstrate that digital technology has played a transformative role in advancing financial inclusion and strengthening economic growth in India. The integration of real-time payment systems, digital identity infrastructure, and mass banking access has reshaped the financial ecosystem. Digital financial inclusion enhances capital mobilization, improves credit allocation, increases fiscal transparency, and supports entrepreneurial expansion.

Although structural constraints such as digital divides and cybersecurity risks remain significant, the overall trajectory indicates that digital technology functions as a foundational pillar of inclusive economic development. The Indian experience highlights the potential of coordinated digital public infrastructure in driving sustainable growth.

The long-term impact of digital financial inclusion will depend on continued investment in digital literacy, regulatory innovation, and institutional safeguards. If effectively managed, digital technology will remain central to India's economic transformation in the coming decades.

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