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Digitalization and Economic Development: Multidisciplinary Perspectives from India

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Abstract

Digitalization has emerged as a transformative force influencing economic systems, governance mechanisms, financial markets, and business models across the globe. In India, the rapid expansion of digital infrastructure, fintech innovations, real-time payment systems, and e-governance initiatives has significantly contributed to economic development. This chapter examines the multidimensional impact of digitalization on commerce, management practices, financial inclusion, infrastructure growth, and sustainable development in India. Drawing upon secondary data from the Reserve Bank of India (RBI), National Payments Corporation of India (NPCI), Telecom Regulatory Authority of India (TRAI), and the Economic Survey of India, the study highlights empirical trends demonstrating exponential growth in digital transactions, internet penetration, and technology-enabled entrepreneurship. The findings indicate that digitalization has enhanced productivity, reduced transaction costs, improved transparency, strengthened financial inclusion, and facilitated innovation-led growth. India's Unified Payments Interface (UPI) has emerged as a global benchmark for interoperable digital payment systems, processing billions of transactions annually. Additionally, the expansion of digital public infrastructure, including Aadhaar-enabled services and Direct Benefit Transfers (DBT), has improved governance efficiency and reduced leakages in welfare delivery. Challenges such as the digital divide, cybersecurity risks, data privacy concerns, and skill gaps remain significant barriers to inclusive digital growth. The chapter concludes that while digitalization is a catalyst for economic transformation, sustained policy interventions, regulatory frameworks, and digital literacy programs are essential to ensure equitable and sustainable development.

Keywords: Digital Economy, Financial Inclusion, Digital India, UPI, Economic Development, FinTech, E-Governance.

Introduction

Digitalization represents a structural transformation in economic activity driven by information and communication technologies (ICT).

In India, the launch of the Digital India Mission in 2015 marked a pivotal shift toward a digitally empowered society and knowledge-based economy. Over the past decade, digital technologies have reshaped commerce, banking, governance, and public service delivery. The proliferation of affordable smartphones, low-cost internet data, and digital public infrastructure has accelerated digital adoption across urban and rural areas. India today hosts one of the world's largest real-time digital payment ecosystems, with billions of annual transactions processed through interoperable platforms. Digital transformation has enhanced transparency, reduced transaction costs, improved efficiency, and expanded market access for individuals and enterprises alike.

From an economic perspective, digitalization enhances productivity and innovation, aligning with endogenous growth theory, which emphasizes technological progress as a driver of long-term economic growth.

Digital Transformation Influences Multiple Dimensions of Economic Development

- Reduction in information asymmetry
- Expansion of financial inclusion
- Enhancement of governance transparency
- Promotion of entrepreneurship and innovation
- Integration of global markets

Digital Infrastructure

- **NIC API eXchange Platform**-is a centralized platform for managing APIs of e-Governance applications and systems. It allows users to easily design, build, publish, and integrate APIs within a secure and reliable environment.
- **CollabFiles**-Collab Files was envisaged in line with the vision of "Atmanirbhar Bharat Abhiyaan", or self-reliant India campaign of 2020, a clarion call by the Honorable Prime Minister of India.
- **API SETU**- API Setu is an Open API Platform from the Ministry of Electronics and IT, Government of India. One of its major objectives is to build an open and interoperable digital platform to enable seamless service delivery across government silos.
- **MeriPehchaan-DigiLocker** MeriPehchaan (NSSO) is a user authentication service in which a single set of credentials provides access to multiple online applications or services.

- DigiLocker, India Stack Global, Common Services Centres, etc.

Objective and Scope

This chapter offers a multidisciplinary view of how digitalization is transforming India's economy and society.

- Empirical Trends in Digital Payments;
- Impact on Commerce and Business Models
- Financial Inclusion and FinTech Revolution
- examine technological, governance, and sectoral perspectives;
- assess inclusion, skills, and regional divides;
- discuss regulatory and trust frameworks; and
- present policy recommendations for sustainable, equitable digital development.

Empirical Trends in Digital Payments

India's digital payment ecosystem has grown exponentially. Total digital transactions increased from 164.4 billion in FY2023 to 221.9 billion in FY2025 (provisional). UPI accounts for over 80% of total digital payments, demonstrating widespread adoption of real-time payment systems. The value of digital transactions has crossed ₹261 lakh crore in FY2025, reflecting increasing trust in digital platforms. The average daily UPI transactions have reached approximately 698 million, indicating deep penetration into routine economic activities.

Impact on Commerce and Business Models

Digitalization has transformed traditional commerce into digital commerce. E-commerce platforms, digital marketplaces, and app-based service ecosystems have expanded consumer choice and market accessibility. MSMEs increasingly rely on digital payment systems, cloud computing, and online marketing strategies. Data-driven decision-making, artificial intelligence-based customer analytics, and automated supply chain management have enhanced operational efficiency. Studies indicate that over 70% of digitally enabled MSMEs report improved revenue performance.

Financial Inclusion and FinTech Revolution

FinTech innovations have significantly improved access to banking services, particularly in rural and semi-urban regions. Digital wallets, Aadhaar-enabled payment systems, and mobile banking applications have reduced reliance on cash transactions. Direct Benefit Transfers (DBT) have minimized leakages in welfare schemes, improving accountability and governance efficiency. Digital lending platforms use alternative credit scoring models to extend microcredit to underserved populations.

Governance and Public Service Delivery

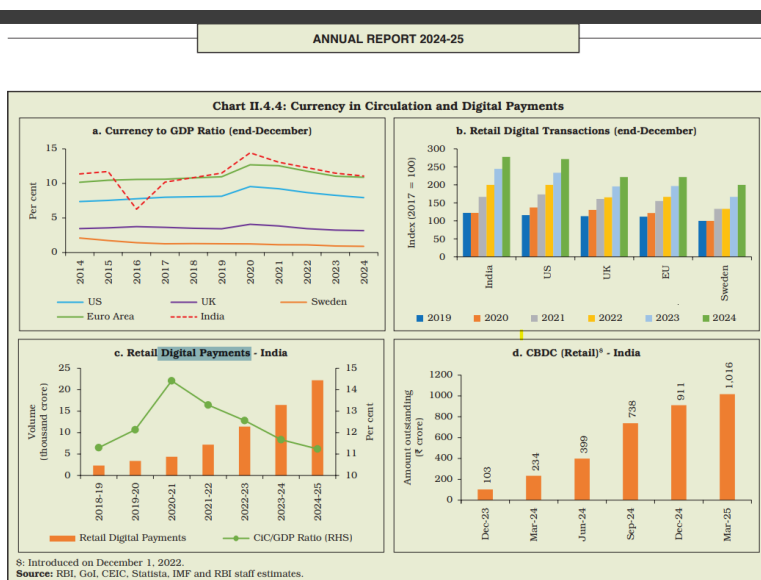
E-governance initiatives have enhanced administrative efficiency and service delivery. Online tax filing systems, digital land records, and government e-marketplaces have improved transparency and reduced corruption. Digital public infrastructure has strengthened citizen-government interactions, ensuring timely and efficient service access.

Challenges and Policy Implications

Despite rapid growth, challenges persist. The digital divide between rural and urban populations remains significant. Cybersecurity threats, data privacy concerns, and limited digital literacy present barriers to inclusive digital development. Policy focus must emphasize cybersecurity frameworks, digital skill training, regulatory oversight, and infrastructure expansion to ensure sustainable growth.

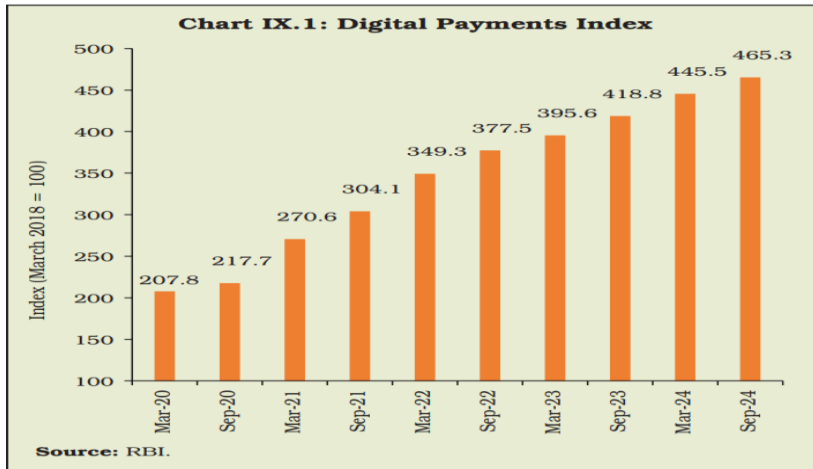
Data Interpretation and Analysis

Chart 1



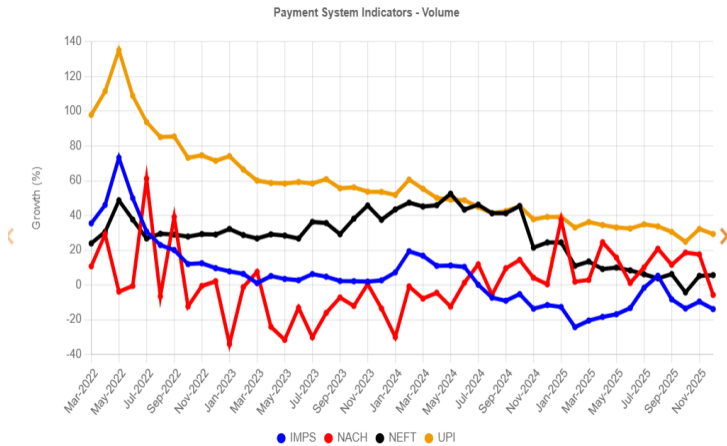
- As per the Annual Report of RBI 2024-25, Currency in Circulation and Digital Payments Currency to GDP Ratio was 5% in 2016 and increase in 2020 and 10% in 2024, as compared to other countries.
- Retail digital Transactions Index shows that 300 points in 2024 as it was 100 points in 2019. Its more than UK, EU Sweden.
- Retail digital Payments-India was the 20 thousands Crore in 2024-25 which was less than 5 thousands crore in 2018-19 and CIC/GDP ratio was 11% in 2024-25 ,5% in 2018-19.

Chart 2



- As per the RBI Report Digital Payments Index shows the increase in Sep 2024 upto the 465.3 as compare to March 2020 was 207.8.

Chart 3



- Payment system Indicators shows that the growth of Immediate Payment Service (IMPS), National Automated Clearing Hose (NACH), NEFT & UPI in % from March 2022 to Nov 2025.

Growth	March 2022 %	Nov 2025 %
IMPS	38	Less than 0
NACH	10	Less than 0
NEFT	20	10
UPI	99	38

Chart 4

PAYMENT AND SETTLEMENT SYSTEMS AND
INFORMATION TECHNOLOGY

Table IX.1: Payment System Indicators - Annual Turnover (April-March)

Item	Volume (lakh)			Value (₹ lakh crore)		
	2022-23	2023-24	2024-25	2022-23	2023-24	2024-25
1	2	3	4	5	6	7
A. Settlement Systems						
CCIL Operated Systems	41	43	47	2,588.0	2,592.1	2,962.2
B. Payment Systems						
1. Large Value Credit Transfers - RTGS	2,426	2,700	3,025	1,499.5	1,708.9	2,013.9
<i>Retail Segment (2 to 6)</i>						
2. Credit Transfers	9,83,621	14,86,107	20,61,015	550.1	675.4	797.8
2.1 AePS (Fund Transfers)	6	4	4	0.004	0.003	0.002
2.2 APBS	17,834	25,888	32,964	2.5	3.9	5.5
2.3 ECS Cr	-	-	-	-	-	-
2.4 IMPS	56,533	60,053	56,250	55.9	65.0	71.4
2.5 NACH Cr	19,257	16,227	16,939	15.4	15.3	16.7
2.6 NEFT	52,847	72,640	96,198	337.2	391.4	443.6
2.7 UPI	8,37,144	13,11,295	18,58,660	139.1	200.0	260.6
3. Debit Transfers and Direct Debits	15,343	18,250	21,660	12.9	16.9	22.1
3.1 BHIM Aadhaar Pay	214	194	230	0.1	0.1	0.1
3.2 ECS Dr	-	-	-	-	-	-
3.3 NACH Dr	13,503	16,426	19,762	12.8	16.8	22.0
3.4 NETC (Linked to Bank Account)	1,626	1,629	1,668	0.03	0.03	0.02
4. Card Payments	63,325	58,470	63,861	21.5	24.2	26.1
4.1 Credit Cards	29,145	35,610	47,741	14.3	18.3	21.1
4.2 Debit Cards	34,179	22,860	16,120	7.2	5.9	5.0
5. Prepaid Payment Instruments	74,667	78,775	70,254	2.9	2.8	2.2
6. Paper-based Instruments	7,109	6,632	6,095	71.7	72.1	71.1
Total Retail Payments (2+3+4+5+6)	11,44,065	16,48,234	22,22,885	659.1	791.5	919.3
Total Payments (1+2+3+4+5+6)	11,46,491	16,50,934	22,25,910	2,158.6	2,500.4	2,933.1
Total Digital Payments (1+2+3+4+5)	11,39,382	16,44,302	22,19,815	2,086.8	2,428.2	2,862.0
CCIL : Clearing Corporation of India Ltd.	AePS : Aadhaar Enabled Payment System.		Cr : Credit.			

India's payment ecosystem in two broad categories, Settlement System and Payment System. Settlement system used mainly for financial market settlement, Managed by the Clearing Corporation of India Ltd. Used for settlement of government securities, forex, and money market transactions. Volume increase from 41 lakh in 2022-23 to 47 lakh in 2024-25 and Value increase from Rs. 2588 lakh to Rs. 2962 lakh crore. Indicates growing activity in financial markets and interbank settlements. The customer and retail payment mechanisms used by individuals, businesses, and banks, which divided into several categories like RTGS, Retail Credit Transfers, Debit Transfers / Direct Debits, Card Payments, Prepaid Payment Instruments (PPIs), Paper-Based Instruments.

Interpretation

RTGS value is extremely high because it handles large corporate and interbank transactions. The steady increase reflects growth in high-value digital transfers and business payments. The retail digital payment systems used by the public are Unified Payments Interface (UPI), National Electronic Funds Transfer (NEFT), National Automated Clearing House (NACH), Immediate Payment Service (IMPS), Aadhaar Enabled Payment System (AePS), Aadhaar Payment Bridge System (APBS).

UPI transactions more than doubled in two years. It has become the dominant retail payment method in India. NEFT continues to grow but slower than UPI. Mostly used for bank-to-bank transfers for moderate values. In NEFT volume relatively stable and value increasing due to higher transaction amounts. Credit card usage is rising rapidly, Debit card usage declining, partly because people prefer UPI for daily payments. UPI replaced many wallet transactions like Phone pay, Amazon pay etc. Retail payments almost doubled in volume in two years. Total Digital Payments in volume increase from 11,39,382 to 22,19,815, it indicates that rapid digitalization of the Indian payment ecosystem.

Conclusion

Digitalization has become a cornerstone of India's economic development strategy. The integration of digital payments, infrastructure expansion, fintech innovation, and governance reforms has accelerated productivity and financial inclusion. However, equitable growth requires bridging digital disparities and strengthening regulatory mechanisms. A multidisciplinary policy approach is essential to harness the full potential of digital transformation in India.

India's digital transformation represents one of the most consequential experiments in leveraging technology for development anywhere in the world. The achievements are undeniable: a digital economy contributing nearly 12% of GDP, world-leading digital public infrastructure, 50% of global digital transactions, and connectivity reaching hundreds of millions who were previously excluded from the digital ecosystem. The vision of a digitally empowered Viksit Bharat by 2047 is not mere rhetoric but a plausible trajectory supported by current trends.

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