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DIGITAL INDIA INITIATIVE AND ITS IMPACT ON ECONOMIC GROWTH: EVIDENCE, CHALLENGES, AND POLICY IMPLICATIONS

Jangam Deeksha

M.A. Economics, UGC-NET
Osmania University, Hyderabad

Abstract

One of the most ambitious state-run digital transformation programmes in a developing economy is the Digital India, which the Government of India started in 2015. The current paper critically discusses how Digital India has had multidimensional effects on economic growth in the country in terms of the contribution to the GDP, creation of employment, financial inclusion, and the development of a strong startup ecosystem. Using secondary data of the Reserve Bank of India (RBI), NITI Aayog, Ministry of Electronics and Information Technology (MeitY), and authoritative reports on the industry, the paper can track down the digital economy growth of India since 2014, USD 107.7 billion through 2023, USD 370 billion, and predict its growth to almost a fifth of overall GDP by 2030. The paper also assesses how Unified Payments Interface (UPI), BharatNet, DigiLocker, and Common Service Centres (CSCs) have transformed the democratisation of access to financial and governmental services. Although it confirms considerable improvements, the research also mentions that the key structural issues remain constant, such as the rural-urban digital divide, cybersecurity problems, and lack of digital literacy. The paper ends by giving evidence-based policy suggestions on how to maximise the inclusive growth opportunities of digital transformation in India.

Keywords: Economic growth, GDP, Digital India, Financial Inclusion, UPI, E-Governance, Digital Divide, Startup Ecosystem, Bharatnet, Digital Literacy.

1. Introduction

A digitally empowered economy has become a growing trend in the development economics discussion, especially with regard to the emerging markets. With its large demographic dividend and growing middle class, India has implemented the Digital India programme with an aim of capitalizing on the opportunity on July 1, 2015, under the leadership of Prime Minister Narendra Modi. The project was conducted under the supervision of the Ministry of Electronics and Information Technology (MeitY) and was aimed at turning the nation into a digitally empowered society and knowledge economy by closing the digital gap between the urban centres and rural hinterlands (Government of India [GOI], 2015).

Digital India has been based on three pillars, namely, digital infrastructure as a utility to all citizens, government, and on-demand governance and services, and digital empowerment of citizens. Operatively, the plan has nine strategic pillars that include broadband highways and public internet access programmes to IT jobs, e-Kranti (delivery of services electronically), and electronic manufacturing that will see net-zero imports. A combination of these pillars deals with the supply-side needs of an infrastructure and the demand-side needs of skills and literacy improvement.

It is hard to overestimate the economic importance of this initiative. The digital economy in India has increased at a rate of 2.4 times compared to the whole economy in the period between 2014 and 2019 (NASSCOM, 2019). The nation has also made an impressive achievement in becoming a so-called real-time digital payment transaction recipient in the world, reaching about 49 percent, which, until just ten years ago, was mainly cash-based (Reserve Bank of India [RBI], 2023). With India making its path to the \$5 trillion economy goal, digital transformation has become a newfound requisite of sustainable and inclusive development.

It is in this light that this paper aims to offer an overall evidence-based evaluation of the economic impact of Digital India. It looks at the impact of the initiative on the growth of the GDP and the digital economy, financial inclusion, employment and entrepreneurship, development of infrastructure, and e-governance, and it also recognizes the structural challenges that still limit the potential of the initiative. The paper is based on secondary sources of government agencies, multilateral agencies, and respected industry organizations to create a comprehensive image of the Indian digital economic transition.



2. Digital India: Vision, Pillars and Policy Framework

The Digital India program can be seen as an overarching policy agenda that is aimed at aligning technology investment towards the developmental objectives. Its three pillars, which are infrastructure, service delivery, and citizen empowerment, are institutionally ingrained in nine areas of operation. The pillar of Broadband Highways seeks to roll out high-speed internet in every gram panchayat, and the public internet access programme allows this by using a network of Common Service Centres (CSCs) located throughout rural India.

The most important, at least in economic terms, pillar is the e-Kranti pillar, which includes digital service delivery in the healthcare sector (e-Hospital), the agricultural sector (National Agriculture Market -eNAM), the educational sector (National Digital Library), the financial sector (Jan Dhan Yojana), and the judicial sector (e-Courts). The IT for Jobs aspect, in its turn, is aimed at developing digitally-skilled labor by training the younger generation in smaller towns and villages to get a job in the sphere of information technology (MeitY, 2022).

Policy instruments have been used in supplement to strengthen the Digital India framework. Startup India (2016), Pradhan Mantri Mudra Yojana, Production-Linked Incentive (PLI) plans in electronics manufacturing, and the National Data Governance Policy have all led to the development of a regulatory and fiscal environment that supports digital entrepreneurship. One example is the digitisation of the indirect tax administration in the country with the introduction of the Goods and Services Tax Network (GSTN) in 2017, and another example is the Aarogya Setu app in 2020, which highlighted the ability of the state to use the digital infrastructure to manage the situation during the pandemic (NITI Aayog, 2021).

3. Economic Impact: GDP and Growth in Digital Economies

The overall economic effect of Digital India is the most obvious in the tremendous growth of the digital economy of the country. The digital industry of India expanded by USD 107.7billion to USD 370billion between 2014 and 2023, and the digital industry in India has a compound annual growth rate (CAGR) of around 15 as compared to the overall economy with a CAGR of about 10 (NASSCOM, 2022). This disparaging rate of growth highlights the ever-growing digital economy dominance in the national income generation.

Table 1

Growth of India's Digital Economy, 2014–2030

Year	Digital Economy (USD Billion)	% of GDP (Approx.)	Key Driver
2014	107.7	~7.5%	IT/BPM sector, mobile adoption
2016	147.0	~8.0%	Demonetisation, UPI launch
2018	200.0	~9.0%	E-commerce, fintech growth
2020	265.0	~10.0%	Pandemic-led digital adoption



Year	Digital Economy (USD Billion)	% of GDP (Approx.)	Key Driver
2022–23	350–370	~11.47%	UPI dominance, 5G rollout
2030 (Projected)	~800–1000	~18–20%	AI, semiconductors, platform economy

Note. Data compiled from NASSCOM (2022), MeitY (2023), and NITI Aayog (2021) projections. Figures for 2030 are indicative projections.

The contribution of the digital economy to national income increased to 11.47 percent in 2022-23 and is expected to go above 13 percent by 2024-25 (MeitY, 2023). In India, the digital transformation market has an incredible CAGR of 74.7% in the period between 2019 and 2024, with a growth of USD 24.5 billion to USD 710 billion (Prescient and Strategic Intelligence, 2024). These statistics make India one of the most vibrant digital economies in the world, second only to China about the rise of digital adoption among the major economies (McKinsey Global Institute, 2019).

Digital transformation has macroeconomic dividends that are not just limited to the headlines. Digitalisation has enhanced total factor productivity in manufacturing, agriculture, and services sectors through access to real-time information, cost reduction of transaction and integration of supply chains. Digitising tax compliance on more than 14 million businesses has resulted in the GST network giving the network a boost to the formal economy and a higher tax buoyancy, which has contributed to a long-term rise in the gross tax revenues of the Centre (RBI, 2023).

4. Digital Payments and Financial Inclusion

Another dimension of Digital India that has changed the most is its effect on financial inclusion. The three components of the Jan Dhan Yojana-Aadhaar-Mobile (JAM) trinity, the bank account-biometric identity-mobile phone linkage has provided an entry point to the formal financial system to the previously unbanked populations. In India, financial inclusion has also significantly increased, as more than 85% of adults nowadays have bank accounts, which was not the case in 2011 (World Bank, 2022) and was directly supported through the digital infrastructure that was established as part of the Digital India programme.

Unified Payments Interface (UPI), created by the National Payments Corporation of India (NPCI) and introduced in 2016, has become a world standard of digital payments in real time. UPI registered more than 1,800 crore (18 billion) transactions per month by April 2025, and India is now estimated to represent 49 per cent. of the global real-time digital transactions (RBI, 2025). It is one of the most significant changes in the architecture of the payment ecosystem in India in the long term, and these changes have significant consequences in terms of tax compliance, financial transparency, and anti-corruption initiatives.



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Table 2

UPI Transaction Growth, 2017–2025

Year	UPI Volume (Crore)	UPI Value (₹ Lakh Crore)	YoY Growth (%)
2017–18	91.9	1.0	—
2018–19	535.4	8.7	482%
2019–20	1,252.0	21.3	134%
2020–21	2,233.0	41.0	78%
2021–22	4,596.0	84.2	106%
2022–23	8,375.0	139.0	82%
2023–24	13,113.0	200.0	57%
April 2025	1,800+ (monthly)	—	—

Note. Source: National Payments Corporation of India (NPCI, 2024); Reserve Bank of India Annual Report (RBI, 2024).

Another resulting success has been the digitalisation of the subsidy delivery by Direct Benefit Transfer (DBT). DBT has been approximated to have avoided leakages of about 2.73 lakh crore since 2013 by weaving the finances of welfare distribution in a fundamental way, where welfare payment is routed straight to the bank accounts of the beneficiaries linked by Aadhaar (Ministry of Finance, 2023). Not only has the removal of intermediaries enhanced efficiency in fiscally efficient approaches, but structural corruption in entitlement programmes has also been reduced.

5. Entrepreneurship, Employment, and Start-up Ecosystem

Digital India has a complex and multidimensional aspect of employment. On the one hand, the digital economy has created significant direct jobs in IT, business process management (BPM), e-commerce, fintech, and digital services. The digital sector had hired around 14.67 million employees in 202223, which is a tremendous growth compared to the pre-initiative level (NASSCOM, 2022). Flipkart, Amazon, Meesho, Zomato, Swiggy, and other platforms have opened up millions more gig and logistics jobs and have fundamentally changed the employment landscape of the service industry.

Startup India is the program that has been running along with the Digital India program in close alignment with each other and has led to the creation of a booming entrepreneurial ecosystem. India is now the country that hosts 83 unicorn startups (companies with a USD 1 billion valuation or more) and is the third in the world in this respect (Invest India, 2023). India Stack infrastructure, including UPI, Aadhaar, DigiLocker, and Open APIs, has reduced the barriers to digital entrepreneurs by many orders of magnitude by offering a common public infrastructure where every startup does not need to develop identity verification and payment processing systems to start operations.



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Table 3

Key Indicators of India's Startup and Digital Employment Ecosystem

Indicator	2015	2023	Growth / Change
Registered Startups	~400	1,17,000+	~290-fold increase
Unicorn Startups	0	83	New category created
Digital Sector Employment (Millions)	~3.9	14.67	~276% growth
FDI in Technology Sector (USD Bn)	~8	~44	~450% increase
Global Innovation Index Rank	81	40	+41 positions

Note. Sources: NASSCOM (2022); Invest India (2023); DPIIT (2023); World Intellectual Property Organisation [WIPO] (2023).

The issue of the effect of this on the economic involvement of women warrants special reference. Bank linkage programme of Self-Help Group (SHG) and the adoption of digital payments, as well as the development of e-commerce, have helped women entrepreneurs in semi-urban and rural areas to enter markets that they could not access before. New procurement opportunities have been developed through platforms such as the Government e-Marketplace (GeM) to give small and woman-managed businesses a chance to procure goods, culminating in half a trillion orders made by 2023 (Ministry of Commerce, 2023).

6. Digital Infrastructure and Connectivity

The economic impact of the Digital India initiative has been anchored on infrastructure investments. The adoption of internet connectivity, a requirement for all digital economic activity, grew by 285 percent to close to 970 million users in 2025 compared to 250 million users in 2014 (Telecom Regulatory Authority of India [TRAI], 2025). Mobile data that cost ₹308 per gigabyte in 2014 had dropped to ₹9.34 per GB in 2022, and India was already one of the lowest data markets in the world, allowing people from both ends of the income groups to adopt mobile internet (TRAI, 2022).

Table 4

Internet and Mobile Infrastructure Growth in India, 2014–2025

Indicator	2014	2020	2025
Internet Users (Millions)	250	700	~970
Mobile Subscribers (Billions)	0.93	1.16	1.18+
Mobile Data Cost (₹/GB)	308	~12	~9.34



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Indicator	2014	2020	2025
5G Towers Installed	0	0	4.74 lakh
Gram Panchayats with Optical Fibre (BharatNet)	0	1.56 lakh	2.18 lakh+
Villages with 4G Coverage	~40,000	~4 lakh	6 lakh+

Note. Sources: TRAI Annual Report (2022, 2025); MeitY (2024); Department of Telecommunications (DOT, 2025).

The largest rural telecommunications infrastructure project ever attempted by a developing nation was the BharatNet project that sought to provide high-speed optical fibre connectivity to all the estimated 2.5 lakh gram panchayats of India. More than 2.18 lakh gram panchayats had been linked to 6.92 lakh kilometres of optical fibre cable by 2025, which serves as a foundation to the provision of government services, telemedicine, and digital education in rural locations (DOT, 2025).

The 5G deployment has been at an unprecedented rate. India installed more than 4.74 lakh 5G towers in the two years following the spectrum auction, and served 99.6% of all districts (MeitY, 2024). This will place India in a position to take advantage of the economic multiplier impact of 5G- projected to add about USD 455 billion to the economy by 2035 (Ericsson, 2022)- in manufacturing automation, precision farming, smart cities, and advanced healthcare. Bhasin, an AI-powered translation and speech-to-text services platform offered in more than 35 languages found in India, has also increased the effective implementation of digital services by removing the language barrier that previously barred significant portions of the rural population.

7. E-Governance and Delivery of Public Services

The digital India e-governance aspect has achieved quantifiable efficiencies, transparency, and accessibility of government services. The UMNG (Unified Mobile Application for New-age Governance) application is a system that incorporates more than 1,200 government services at the central and state levels, where citizens receive their services via a mobile application without having to go to government offices (MeitY, 2022). DigiLocker is a digital document storage and sharing platform on the cloud that has more than 53.2 million registered users as of 2024, and has issued more than 6 billion documents via the platform (MeitY, 2024).

The GeM is one in particular that has been consequential in the transformation of the public procurement system. GeM has digitised the procurement process, which has led to less discretionary decision-making, more price discoveries, and increased participation of vendors with small and medium enterprises. By 2023, cumulative procurement with GeM had gone above 4 lakh crore, which is a great change in the size and efficiency of government procurement (Ministry of Commerce, 2023).

The GSTN has automated indirect tax administration in excess of 14 million GST-registered businesses, minimised compliance overheads, and improved audit trails, as well as tax buoyancy. The faceless assessment scheme started by the Income Tax Department in 2020 removed the physical contact between the taxpayers and the tax officials in routine assessments, which removed the possibility of corruption and increased the rate of tax compliance. These reforms in governance brought about by digital infrastructure are a qualitative change in the Indian system of administration of the public.



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8. Systematic Problems and Systemic Limitations

Regardless of its proven record of success, the Digital India initiative is facing a complex of structural problems that threaten to undermine its economic success in the area of inclusivity and sustainability. The rural-urban digital divide is also becoming smaller, but it is still significant. The rural internet penetration is about 37 per cent against 67 per cent in urban areas (TRAI, 2022), revealing the inequality in the quality of infrastructure, final mile connectivity, and access to devices. Inaccessibility of digital technology by women is also limited by social expectations, financial reliance, and lower literacy, especially in the states of the north and the center.

The threat of cybersecurity only grows more urgent as the number of digital transactions grows. In 2022, the figures for cybersecurity incidents in India were 13.9 lakh, which was reported by the Indian Computer Emergency Response Team (CERT-In, 2023). The financial services industry, healthcare records, and critical infrastructure are especially susceptible, and the legal and institutional framework of cybersecurity governance is underdeveloped compared to the rate of digitalisation. The Personal Data Protection framework remains in its developmental stages, providing businesses with regulatory ambiguity.

The third structural constraint is the digital skills gap. Although Digital India has been investing in digital literacy, including the Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA) programme that has reached more than 6.6 crore rural citizens by 2023, there is an insufficient coverage of digital skills, which are not sufficient to satisfy the needs of a highly digital economy. The minimum level of operational literacy, restricted to smartphone access and use of simple apps, does not correspond to a comprehensive and higher-order level of cognitive and technical demands to engage in productive use of the digital value chains in emerging industries like AI, cloud computing, and data science.

9. Implications of the policy and the future

There are several future policy prescriptions that are supported by the evidence reviewed in this paper. First, to achieve the digital divide, it is crucial to maintain the long-term investments of the general population in the infrastructure of the last-mile connections, and to introduce effective subsidies on the ownership of devices among the low-income families. The BharatNet programme should be supplemented with state-level programs, which should cover disparities within the districts and especially aspirational districts with poor human development indicators.

Second, there should be a redesign of the digital skills ecosystem, where it should no longer be a narrow view of digital literacy, but a broad framework of digital skills (e.g., digital marketing, data analysis, e-commerce management) and advanced technical skills (e.g., software development, cybersecurity, AI/ML engineering). Fiscal and regulatory tools should encourage industry-academia associations, on-the-job apprenticeship programs, and the rewarding of previous learning by issuing digital credentials.

Third, the data and cybersecurity institutions need to be strengthened on an urgent basis. Strong Personal Data Protection Act, a well-staffed national cybersecurity agency, and the obligatory cybersecurity rules for operators of critical infrastructure are the conditions of maintaining community confidence in the work of digital systems. The desire of India to emerge as a global leader in AI governance, as demonstrated by the Global IndiaAI Summit, scheduled to take place in India in 2024, will have to be supported by local institutions that will be able to ensure the responsible management of data.

Fourth, digital inclusion should be extended to the gender aspect, and should be mainstreamed in all programme design and evaluation models. Specific digital entrepreneurship support to women, digital literacy programs with a specific focus on social and cultural differences, and integration between digital financial services and women's SHG networks can assist in making sure that the benefits of digital transformation are equally distributed.



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10. Conclusion

In the first decade of its execution, the Digital India initiative has shown that digital transformation can be a potent driver of economic development of a large, diverse, and developing economy. The data used in this paper will support major benefits in several aspects: national income due to the digital economy more than doubled, growing since 2014 between about 7.5 and 11.47 percent; UPI has democratized the financial services of hundreds of millions of formerly underbanked citizens; the startup ecosystem created 83 unicorns and more than 14 million direct jobs; and 4G and 5G connectivity currently serve more than half a million villages.

But to continue such a trajectory of digital-led growth, it is necessary to address the structural fault lines that pose the danger of increasing inequality and not decreasing it. Rural-urban divide, the gender disparity in online access, the cybersecurity gap, and insufficiency of the digital skills pipeline are not marginal issues, but rather the focus of the Digital India question of whether the achievement will be widespread and sustainable. The experience of digitalisation driven by comparative digital economies indicates that the economic payoff of the digitalisation process in the long-run depends not only on the use of technology but on the complementarities in institutions, human capital, and regulation that enable technology to be reflectively internalised across all groups of workers and all parts of the nation.

India is at one of the crossroads of its online economic process. The core infrastructure that is developed by Digital India offers a global platform. The next decade is the challenge of making digital participation more inclusive and quality, as connectivity is not just a physical reality but a digital capability, a widespread economic asset. Provided that this transition is conducted with proper policy tuning as well as institutional capacity, Digital India can play an effective role in ensuring that India emerges as a 5 trillion economy and eventually a developed economy in 2047.

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