

# India's Digital Revolution – A New Era of Economic Growth

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## Abstract

Digital economy is a one of the rapidly growing sector in Indian economy. It is estimated that it had been contributed 11 per cent in 2022 – 23 of the Indian economy. And it has been predicted that it will fifth of the economy by 2030. The digital economy includes key components like government, infrastructure, telecom, e-business, digital services, and emerging technologies. In India, these are rapidly expanding, fueling the nation's digital transformation. Digital Infrastructure: This includes high-speed internet networks, data centers, cloud computing services, and communication technologies that form the backbone of digital interactions. E-Commerce Platforms: Online marketplaces and retail platforms facilitate the buying and selling of goods and services, expanding market reach and consumer access. Digital Content and Media: Streaming services, online publications, and social media platforms distribute content digitally, influencing consumer engagement and advertising strategies. Digital Services: Services delivered through digital means, including online education, telemedicine, and virtual consultations, enhance accessibility and convenience. Cybersecurity: Protecting digital assets and information through robust cybersecurity measures is crucial to maintaining trust and integrity in the digital economy. Government, Policy, and Regulation: Governments play a critical role by enacting policies and regulatory frameworks that foster innovation, ensure competition, protect consumers, and maintain data privacy. Initiatives like Digital India and data protection laws are examples of enabling digital governance. Emerging Technologies: Advanced technologies such as Artificial Intelligence (AI), Blockchain, the Internet of Things (IoT), 5G, and Quantum Computing are foundational to the next phase of digital transformation. They create new business models, automate processes, and increase decision-making precision.

## 1. Introduction

An online interaction among the people either in business deals or other economic activities are called as digital economic system. Digital economy includes digitalization of information and communication technology, online platform based business; rapid innovations, interconnected networks etc. As Prime Minister Narendra Modi marks 11 years in office, India's digital economy is poised to become a cornerstone of national growth, projected to account for nearly one-fifth of the country's income by 2029-30. According to the State of India's Digital Economy Report 2024, India ranks as the third most digitized economy globally and 12th among G20 nations for individual user digitalization, reflecting remarkable progress in digital transformation over the past decade. The digital economy, contributing 11.74% of India's GDP (Rs. 31.64 lakh crore or USD 402 billion) in 2022-23, is growing nearly twice as fast as the overall economy. Employing 14.67 million workers—2.55% of the workforce—it is almost five times more

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productive than other sectors. Under PM Modi's leadership, this sector has flourished, driven by digital-enabling industries like ICT services, electronic component manufacturing, and communication equipment, which account for 7.83% of Gross Value Added (GVA). Digital platforms and intermediaries contribute an additional 2% of GVA, while digitalization in traditional sectors such as banking, financial services, insurance (BFSI), retail, and education adds another 2%. By 2029-30, the digital economy is expected to outpace agriculture and manufacturing, fueled by rapid adoption of artificial intelligence (AI), cloud services, and the expansion of global capability centers (GCCs). India hosts 55% of the world's GCCs, which are offshore hubs established by multinational corporations for services like R&D, IT support, and business process management.

## 2. Objectives

- To analyze the government initiatives for the digital economy of India
- To examine the Key aspects and development of the Digital Economy of the India.
- To study the challenges and future outlook.

## 3. Review of Literature

The researchers and scientists are moving toward the utilization of recently introduced IoT technologies for the development of the digital economy in India. The research is descriptive and exploratory research. A research papers and articles provide the research detailed insight about the role of digital India and the implications of this project in India. Rani concluded that the digital India project provides a huge opportunity to use the latest technology to redefine India the paradigms of service industry. It also pointed out that many projects may require some transformational process, reengineering, refinements to achieve the desired service level objectives. Midha concluded that digital India is a great plan to develop India for knowledge future but its improper implementation due to inaccessibility and inflexibility to requisite can lead to its failure. Though digital India programme is facing number of challenges yet if properly implemented it can make the best future of every citizen. So we Indians should work together to shape the knowledge economy. Gupta and Arora studied the impact of digital India project on India's rural sector. The study found that many schemes have been launched in digital India to boost agriculture sector and entrepreneurship development in rural areas. Digital India programme has also set the stage for empowerment of rural Indian women. Review of Literature provides the information of research work already done by the researchers relating to the topic of study. The work related to the study may support or conflict with present results. A number of research papers and articles provide detailed insight about the role of digital India and the implications of this project in India. The use of IT can increase transparency and accountability, simply by requiring information, such as basic complaints, to be logged completely and systematically. Kapur and Ramamurti in their study argue for even broader impacts, extending to industries such as biotech, chemicals, media and entertainment, and construction all require knowledge services that go beyond the basic definition of IT-enabled services, and have all benefited from the change in management approach wrought first within the IT sector.

## 4. Digital Economy: Government Initiatives

The term digital economy refers to economic activities enabled by the extensive web of online interactions among individuals, businesses, machines, data, and systems that occur daily. It includes a variety of digital technologies such as the Internet, mobile and sensor networks, cloud computing, artificial intelligence, machine learning, and block chain. The Key features of the digital economy include: Digitization of Information and Communication, Interconnectedness and Network Effects, Data-driven decision-making, Platform-based business models and Rapid innovation and disruption.

**Key Drivers:** The most significant contributors within the digital economy are the digitally enabling sectors, such as Information and Communication Technology (ICT) services, and the manufacturing of electronics, computer systems, and communication equipment. These core segments collectively added about 7.83% to the Gross Value Added (GVA). In addition, digital platforms and online intermediaries contributed another 2% of GVA, reflecting the rising influence of e-commerce, fintech, and digital marketplaces. Digital transformation is also making substantial inroads into traditional industries like banking, finance, retail, and education, which together contributed an extra 2% to GVA through digital adoption. **Potential of India's digital economy:** India's digital economy is projected to make up 20% of the country's GVA by 2029–30, surpassing contributions from agriculture and manufacturing. Key enablers of this rapid expansion include the growing adoption of artificial intelligence (AI), cloud computing, and the increasing presence of Global Capability Centers (GCCs). India now hosts over 55% of the world's GCCs, which are offshore hubs established by multinational companies to deliver services such as research and development (R&D), IT operations, and business process management for their parent organizations.

India has launched several significant initiatives as part of its Digital India program to transform the country into a digitally empowered society and knowledge economy. Here are some major initiatives:

- **Digital India Programme:** The Digital India Programme, launched in 2015, seeks to build a digitally empowered society and knowledge-based economy by enhancing digital infrastructure and connectivity across the country.
- **Unified Payments Interface (UPI):** Introduced in 2016, UPI revolutionized digital payments, processing 83% of India's digital transactions and surpassing global giants in both transaction volume and value by 2025.
- **Pradhan Mantri Garin Digital Saksharta Abhiyan (PMGDISHA):** Started in 2017, PMGDISHA has trained over 6 crore rural citizens in digital literacy, equipping them with essential skills for internet use, digital devices, and cashless transactions.
- **Startup India:** This initiative fosters innovation and entrepreneurship by supporting startups with funding, regulatory ease, and access to digital infrastructure, helping India become a global startup hub.
- **National Digital Communication Policy (NDCP) 2018:** NDGP 2018 focuses on expanding digital infrastructure, improving broadband connectivity, and promoting advanced technologies like 5G to enhance India's digital ecosystem.
- **National Artificial Intelligence Mission:** This mission aims to position India as a leader in AI by promoting research, development, and adoption of artificial intelligence across sectors such as healthcare, agriculture, and education.

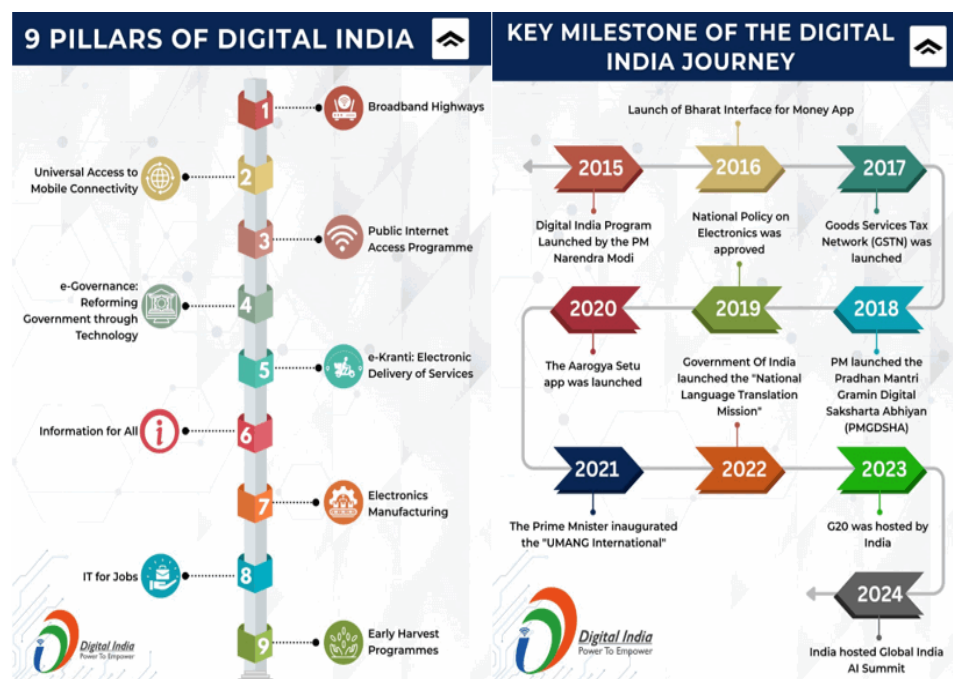
#### 4.1 Key Pillars

The Digital India Initiative is built upon nine key pillars, each focusing on a specific aspect of transforming India into a digitally empowered nation.

- **Bharat Interface for Money (BHIM) App:** Launched in December 2016, BHIM is an Indian mobile payment app developed by the National Payments Corporation of India based on the Unified Payments Interface.

- Goods and Services Tax Network (GSTN) portal was launched in July 2017 to requester the taxpayers. Since then, the number of registered taxpayers has doubled to 1.23 crore.
- Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA) was launched in 2018, it aims to promote digital literacy in rural India, it has been covering six crore rural households.
- Aarogya Setu App was launched in 2020 to bring the people of India together in a resolute fight against COVID-19.
- Telephone Connections: Rose from ₹93.3 crore in March 2014 to over ₹120 crore in April 2025.
- Internet connections: Jumped from 25.15 Cr (2014) to 96.96 Cr (2024), registering a growth of 285.53%.
- Broadband Connections: Rose from 6.1 Cr (2014) to 94.92 Cr (2024), a 1,452% increase.
- 5G and Connectivity: 5G was launched in 2022. In just 22 months, India installed 4.74 lakh 5G towers, covering 99.6% of districts.
- Bharat Net: Connected over 2.18 lakh Gram Panchayats with high-speed internet (Jan 2025).
- UPI: Nearly 460 million people and 65 million merchants use UPI. According to the ACI Worldwide Report 2024, India handled 49% of global real-time transactions in 2023.
- Aadhaar: Aadhaar-based e-KYC system has helped simplify processes in both banking & public services. It facilitated faster verification, reduced paperwork, and brought transparency across various sectors.
- As of April 2025, 142 crore Aadhaar IDs have been generated.
- Direct Benefits Transfer: DBT utilizes Aadhaar to deliver welfare payments directly, thereby eliminating fake beneficiaries. It saved the Government over ₹3.48 lakh crore between 2015 and March 2023.
- By May 2025, ₹44 lakh crore will have been transferred through DBT.
- Open Network for Digital Commerce: Launched in 2022, it helps small businesses enter digital markets. By Jan 2025, it covered 616+ cities & registered more than 7.64 lakh sellers & service providers.
- Government e-Marketplace: Launched in 2016, it enables purchase of goods & services by govt. departments. It has over 1.6 lakh government buyers & more than 22.5 lakh sellers & service providers.
- India AI Mission (2024): It aims to build a robust and inclusive AI ecosystem. By May 2025, India's national computing power had surpassed 34,000 GPUs, marking a significant milestone in the growth of AI infrastructure.
- India Semiconductor Mission: It aims to build a strong semiconductor and display ecosystem, positioning India as a global hub for electronics manufacturing and design.

- As of 14 May 2025, six semiconductor projects worth ₹1.55 lakh crore have been approved.
- Karma yogi Bharat + ingot: Under Mission Karma yogi, the platform trains civil servants with the right Attitude, Skills, and Knowledge. As of May 2025, over 1.21 crore officials are on boarded.
- DigiLocker: It offers citizens access to digital documents. By June 2025, users reached 53.92 crore.
- UMANG: It is a single mobile platform that enables citizens to access services from central to Local Governments. As of June 2025, it has 8.34 crore user registrations.
- BHASHINI (Basha Interface for India): Launched in 2022, it aims to facilitate easy access to the internet and digital services in Indian languages, including voice-based access, and support the creation of content in these languages. BHASHINI supports over 35 languages with > 1,600 AI models and 18 language services (May 2025).
- Quality Jobs: 90% informal workforce & only 48% youth employable (India Skills Report).
- Industry-Skill Mismatch: Only 5.4% formally trained vs. Germany 75%, Japan 80%.



Source: Secondary Source

#### 4.2 Key aspects and development

- GDP contribution: The digital economy's share of India's GDP was 11.74% in 2022-23, and this is projected to rise to 20% by 2029-30.

- **Productivity and employment:** It is nearly five times more productive than the rest of the economy, employing 14.67 million people (2.55% of the workforce) in 2022-23. Digital platforms are also creating new opportunities, particularly for women.
- **Digital infrastructure:** India is the third-largest digitalized economy globally and has the second-largest number of internet users.
- **Digital payments:** India is a global leader in digital payments, accounting for 49% of global real-time transactions in 2023. The Unified Payments Interface is a key component of this, processing billions of transactions.
- **E-commerce:** The e-commerce market is growing rapidly due to convenience and affordability.
- **Sectoral growth:** The core digital economy (ICT, BPOs) is a major contributor, but sectors like retail, health, and education that are increasingly using digital platforms are also part of its expansion.
- **Drivers of development**
- **Government initiatives:** Programs like Digital India have been instrumental in driving digital transformation.
- **Improved connectivity:** Government and private sector efforts have expanded internet access, especially in rural areas, supported by lower telecom prices.
- **Smartphone penetration:** The number of Smartphone users is expected to reach 1 billion by 2026.
- **Policy and investment:** A focus on creating a favorable environment for digital companies, regulating data privacy, and developing skills is accelerating growth.
- **Challenges and future outlook**
- **Digitalization gap:** While India is a leader in economy-wide digitalization, the average user's level of digitalization is still modest.
- **Regional disparity:** Digitalization levels are higher in richer states compared to poorer ones.
- **AI and innovation:** With focused investment and policy, India has the potential to challenge the AI hegemony of the US and China.
- **Future growth:** Growth is expected from digital platforms, the digitalization of traditional sectors, and the ongoing expansion of digital infrastructure.
- **SAMARTH Udyog Bharat 4.0:** Prepares industries for Industry 4.0 with advanced technology integration.
- **SWAYAM:** Hosts 4,000+ courses; 40 million enrollments emphasize the demand for technical education.
- **Skill India Digital Hub:** Offers 752 courses with over 7.37 lakh minutes of digital content.

- SANKALP and STRIVE: The SANKALP programme focuses on the district-level skilling ecosystem, while the STRIVE project aims to improve the performance of ITIs.
- Pradhan Mantri Kaushal Vikas Yojana (PMKVY): It focuses on imparting skill development training to youth nationwide, including in rural areas.
- Integrate into Existing Platforms: Host gamified modules on SWAYAM and Skill India Digital Hub to leverage their extensive reach and content base.
- Customized Training Modules: Develop sector-specific gamified modules to address skill gaps.
- Collaboration with Industry: Encourage partnerships with industries for live projects and internships to enhance practical learning.
- Follow Global Best Practices: Successfully incorporated gamified and simulation-based learning into skilling systems, boosting workforce competence.
- Adoption at Decentralized Levels: Extend modules to educational institutions and training centers to reach a wider audience.
- Parliament passed the Promotion and Regulation of Online Gaming Bill, 2025, aiming to ban Real Money Games (RMGs) while promoting e-sports and social gaming. It creates India's first national framework, resolving fragmented state-level gaming laws.
- Societal Benefits of the Act
- Boost to Creative Economy: The Act promotes e-sports and safe games, driving exports, jobs, and innovation in India's digital economy.
- Youth Empowerment through E-Sports: It provides young people with safe, constructive avenues to build skills, confidence, and career opportunities.
- Creation of a Safer Digital Space: By banning predatory money games, the Act protects families from addiction and financial distress.
- National Quantum Mission
- The National Quantum Mission (NQM), launched in 2023 (budget – Rs. 6003.65 crore), aims to propel India to the forefront of quantum technology research and development.
- The mission's advancements promise benefits in communication, healthcare, finance and energy, impacting drug discovery, space exploration, banking security, and sustainable development.
- It supports national initiatives like Digital India, Make in India, Skill India, Stand-up India, Startup India, Self-reliant India, and the Sustainable Development Goals (SDGs).



- It is implemented by the Department of Science & Technology.
- Objectives
  - To develop intermediate-scale quantum computers (50-1000 physical qubits) within eight years, leveraging both superconducting and photonic technologies. To establish secure communication networks within India and internationally.
  - To develop high-sensitivity magnetometers using atomic systems and ultra-precise atomic clocks for enhanced timing, communication, and navigation applications.
- Thematic Hubs
  - The NQM will establish four Thematic Hubs (T-Hubs) housed within leading academic and national R&D institutes. Each hub will specialize in a specific area:
    - Quantum Computing
    - Quantum Communication
    - Quantum Sensing & Metrology
    - Quantum Materials & Devices
  - Quantum Materials and Devices
    - This hub aims to design and synthesize novel materials, such as superconductors, advanced semiconductors, and topological materials, for building quantum devices.
    - Also, single-photon sources/detectors and entangled photon sources should be developed for use in quantum communication, sensing, and metrology.
- Quantum Computers
  - Quantum science and technologies, particularly quantum computers, have gained increasing attention.
  - Quantum computers are a fundamentally different type of computing technology that harnesses the principles of quantum mechanics to perform calculations.
  - Quantum computers use quantum bits or qubits that can exist as 0, 1, or a quantum superposition (like 0s and 1s in classical computers) of both states simultaneously to perform calculations.
  - Fully operational quantum computers do not yet exist.
  - Quantum computers are expected to have transformative effects on electronics, clean energy, and drug development due to their superior computational abilities.



- Challenges in Digital Economy
- Infrastructure Development: Slow progress in the deployment of Bharat Net.
- Digital Divide: Only 17% of rural households have internet access through any device, while urban households enjoy a much higher rate of 44% (India Inequality Report, 2022).
- Data Breaches: Aadhaar data breach of 81.5 crore citizens (Global Risk Report).
- Cyber Attacks: India ranked as the third-largest country for phishing attacks after the US and UK.
- Privacy Issue: Lack of comprehensive data protection law. E.g., the recent Pegasus attack on MPs.
- Lack of R&D: India spends only 0.64% to 0.7% of its GDP to R&D.
- Strong Cyber security Measures: To safeguard users against fraud and cyberattacks. For example, UK General Data Protection Regulation and Data Protection Act, 2018.
- Allocation of Funds: For upgrading digital infrastructure to guarantee consistent internet access.
- Fetch Innovation: To cater to the unique requirements of the Indian market. For example, Paytm soundbox that provides instant notifications when you receive a payment.
- Skill Development: Scale up Digital Skilling Mission to train one crore youth in AI, cloud, & cyber security.
- Research and Development: Countries such as Israel spends about 5.56% of their GDP to R&D.

## 5. Challenges and future outlook

- Digital Divide: There is a significant gap between urban and rural areas in internet access and digital literacy, with rural penetration lagging far behind.
- Cybersecurity: India faces a high number of cyber-attacks, and a strong cybersecurity framework is needed to protect users and data.
- Data privacy: While a data protection law exists, challenges remain with data breaches and ensuring user privacy.
- Job displacement: Automation, especially through AI, poses a risk of job losses in certain sectors.
- Infrastructure gap: Slow progress in developing digital infrastructure, such as the BharatNet project, hinders universal access.
- Prospects

- Future growth: The digital economy is expected to become a major driver of overall economic growth, potentially contributing as much as 20% of national income by 2030.
- Job creation: It is likely to create new jobs in high-skill areas like AI, data science, and cybersecurity.
- Increased productivity: Continued digitalization is expected to boost productivity across various sectors.
- Financial inclusion: Digital financial services can reach a larger portion of the population, promoting greater financial inclusion.
- The digital economy's key challenges include the digital divide, data privacy concerns, job displacement due to automation, regulatory hurdles, market monopolies, rising cybercrime, and the environmental impact of increased energy consumption and e-waste.
- Digital Divide: Despite over 900 million internet users in India by 2025, rural internet penetration remains just 35% compared to 70% in urban areas, perpetuating socio-economic and educational inequalities.
- Data Privacy and Security: India's Digital Personal Data Protection Act, 2023, mandates explicit consent and data localization, but rising data breaches and evolving cyber threats highlight ongoing privacy and cyber security concerns.
- Job Displacement: AI-driven automation in India could lead to significant job losses, with estimates ranging from 12 to 18 million jobs potentially being affected.
- Regulatory Challenges: India's digital regulations struggle to keep pace with rapid tech changes; unclear policies on AI, data protection, and content moderation often lead to compliance uncertainty and industry pushback.
- Digital Monopolies: The Competition Commission of India fined Meta ₹213 crore in 2024 for abuse of dominance, reflecting concerns over Big Tech's market power, anti-competitive practices, and the stifling of innovation.

## 6. Future Outlook

Digital Economy Way Forward involves creating inclusive, secure, and innovation-driven digital ecosystems. It requires strengthening infrastructure, updating policies, bridging skill gaps, and ensuring equitable access to maximise India's digital growth potential.

- Expanding Digital Infrastructure: Continued investment in high-speed internet, 5G networks, and rural connectivity is critical. This ensures that digital services are available even in the most remote areas.
- Enhancing Digital Literacy: This program aimed at improving the digital skills in the population. This includes both basic digital skills training and advanced IT and coding training.
- Supporting Startups and Innovation: By providing funding, mentorship, and regulatory support, we can foster innovation in the digital space.

- **Strengthening Cybersecurity:** As the number of digital transactions and data usage grows, strong cybersecurity measures are required to protect against threats and build user trust.
- **Leveraging AI and Big Data:** Using artificial intelligence and big data analytics can improve decision-making, service delivery, and drive efficiencies in a variety of industries.... Read more at: h National Initiatives: The government of India had made tremendous initiatives for the development of the Digital Economy through Make in India, Digital India, Startup India, and ₹111 lakh crore infrastructure need skilled professionals.
- **Slowdown:** China's wage rise & aging workforce create India's "factory of work" opportunity.
- **Enhanced Engagement:** Game elements like rewards and leader boards make learning interactive and enjoyable, increasing participation.
- **Improved Retention:** Hands-on simulations and instant feedback ensure better knowledge retention and skill application.
- **Safe Environments:** Simulation-based modules allow trainees to experiment without real-world risks.
- **Skill Assessment:** Simulations evaluate decision-making and problem-solving abilities, providing practical insights into trainee performance.
- **Customization:** Training modules can be tailored to address skill gaps & simulate real-world challenges.
- **Limited Reach of Skilling Programs:** Only 21% of youth aged 15-29 years received vocational/technical training in 2022-23; just 4.4% received formal training.
- **Low Employability:** Only 51% of India's graduates are employable, indicating a gap between education and industry requirements.
- **Industry 4.0 Readiness:** Only 1.5% of engineers possess new-age skills like AI, IoT and robotics. 60% of MSME workers lack digital skills.
- **Irrelevance of Skilling Programs:** Existing initiatives often fail to align training content with modern industry needs, especially for Industry 4.0 demands.
- **The Government of India** launched a flagship programme in 2015 to transform India into a digitally empowered society and knowledge economy.
- **Under Umbrella Programme,** the Digital India comprises various initiatives under a single programme, each targeted at preparing India to become a knowledge economy and bringing good governance to its citizens.

## 7. Digital Economy Benefits

- The digital economy benefits include productivity, global market access, innovation, financial inclusion, job creation, environmental sustainability, and enhanced public service delivery through e-governance initiatives.

- **Increased Productivity:** India's digital economy is nearly five times more productive than traditional sectors, with digital technologies streamlining operations, automating tasks, and boosting efficiency across industries.
- **Global Market Access:** E-commerce and Trade
- **Tech platforms** have enabled Indian businesses, especially MSMEs, to access global markets, with the e-commerce sector exports targeting \$1 trillion by 2030.
- **Innovation and Entrepreneurship:** The digital ecosystem lowers entry barriers, fosters innovation, and supports entrepreneurship. India's start-up count is expected to reach 180,000 by 2030, with \$170 billion in cumulative funding by 2025.
- **Financial Inclusion:** The adoption of digital payment systems, such as the Unified Payments Interface (UPI), has expanded access to banking and credit services, particularly in underserved communities.
- **Job Creation:** The digital economy generates new job roles and opportunities in emerging technology industries. It added 2.55% of workforce by 2022–23 to India's economy, including roles in AI and cyber security.
- **Complementary to Emerging Economies:** The digital economy plays a crucial role in advancing the green economy, blue economy, and circular economy by enabling smart resource management, support marine and environmental sustainability.
- **Environmental Sustainability:** Digital technologies, including Green IT and cloud computing, support sustainable practices by improving resource mobilization, reducing energy use, and cutting emissions, helping countries achieve Sustainable Development Goals.
- **Cybercrime:** India recorded 65,893 cybercrime cases in 2022, and in the first 10 months of 2024–25 alone, digital financial frauds have led to losses amounting to ₹4,245 crore.

## 8. Conclusion

The literature broadly concludes that India's digital economy is a powerful engine for inclusive and sustainable growth, with significant potential to transform various sectors and improve the quality of life for its citizens. The growth of digital intermediaries and platforms is anticipated to lead in the short term, with broader digital diffusion across the economy reducing the relative share of ICT industries over time. Digital transformation is reshaping traditional sectors unevenly. In BFSI, over 95% of banking payment transactions are digital, but revenue-generating activities like loans and investments remain largely offline. Retail is embracing omni-channel models, with e-tailers adding physical stores and leveraging AI chatbots and digital inventory tools for efficiency. Education is adopting hybrid models combining offline and online learning, while hospitality and logistics are integrating AI, metaverse technologies, and digital tools, though smaller firms lag behind larger ones in full digitalization. The digital economy's growth rate of 17.3% over the past decade surpasses the overall economy's 11.8%. Digital platforms, in particular, are projected to grow at approximately 30% in the coming years. In 2022-23, the sector employed 14.67 million workers, with 58.07% in digital-enabling industries. Notably, digital platforms are creating job opportunities for women, overcoming barriers related to mobility and safety, though the workforce remains predominantly male. However, realizing this full

potential requires a concerted effort to address infrastructure gaps, promote universal digital literacy, and establish strong security and privacy regulations.

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