

Ethical AI, Digital Finance and Smart Governance: Building a Sustainable Digital Economy for Viksit Bharat 2047

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ABSTRACT

The vision of Viksit Bharat 2047 envisions India's transformation into a developed, inclusive, and sustainable economy by the centenary of its independence. Central to this transformation are the digital economy, financial technology (FinTech), and smart governance systems powered by Artificial Intelligence (AI) and embedded within ethical and sustainability frameworks. This research paper examines how AI-driven digital transformation can reshape management practices, financial ecosystems, and public governance to promote equitable growth and global competitiveness. The study employs a mixed-method approach using secondary data from international financial institutions, policy think tanks, and empirical case studies of India's Digital Public Infrastructure (DPI), including Aadhaar, UPI, and AI-enabled governance platforms. The literature review integrates theoretical perspectives on digital capitalism, FinTech evolution, smart governance, AI ethics, and sustainable development. The findings suggest that AI-enabled FinTech ecosystems significantly enhance financial inclusion, reduce information asymmetry, and promote MSME participation in the formal economy. Smart governance models improve transparency, service delivery efficiency, and predictive policy formulation. However, risks such as algorithmic bias, data privacy concerns, cybersecurity vulnerabilities, and environmental costs of AI systems pose substantial ethical and sustainability challenges. The paper proposes an integrated framework combining responsible AI governance, ESG-aligned digital finance, adaptive regulatory institutions, and sustainable digital infrastructure. It argues that ethical AI and green digital transformation must be embedded in management paradigms to ensure long-term socio-economic stability. The study concludes that achieving Viksit Bharat 2047 requires a holistic alignment of technological innovation with ethical safeguards and sustainability imperatives, positioning India as a global leader in responsible digital governance.

Keywords: Digital Economy, FinTech, Smart Governance, AI Ethics, Sustainability, Digital Public Infrastructure, Financial Inclusion, Viksit Bharat 2047.

Introduction

The twenty-first century global economy is increasingly defined by digital transformation, platformization, artificial intelligence, and data-centric business models. The digital economy encompasses economic activities enabled by digital technologies, including e-commerce, digital payments, AI-driven analytics, and cloud-based infrastructure. As Brynjolfsson and McAfee (2014) argue, digital technologies constitute a "general-purpose technology" capable of reshaping productivity, organizational structures, and global competitiveness.

India's aspiration for *Viksit Bharat 2047* reflects a strategic ambition to leverage digital innovation for sustainable and inclusive economic growth. Digital India initiatives, digital public infrastructure, and expanding FinTech ecosystems have already transformed the country's economic landscape. The integration of AI in governance and financial systems provides opportunities for efficiency and transparency but simultaneously introduces ethical and sustainability challenges.

The intersection of Digital Economy, FinTech, Smart Governance, AI Ethics, and Sustainability represents a transformative management paradigm essential for long-term economic resilience. This study explores this intersection in the context of India's development trajectory toward 2047.

Review of Literature

- **Digital Economy and Economic Transformation**

The digital economy concept emerged prominently in the mid-1990s, with Tapscott (1996) describing it as an economy based on networked intelligence and digital integration. Later, scholars such as Brynjolfsson and McAfee (2014) emphasized the productivity gains derived from automation, AI, and big data analytics, arguing that digital transformation accelerates innovation cycles and global value chain integration.

The OECD (2019) defines digital transformation as the integration of digital technologies across sectors, reshaping production, consumption, and governance. Empirical studies demonstrate that digital adoption correlates positively with GDP growth, productivity, and export competitiveness (OECD, 2019). However, concerns remain regarding digital divides and inequality. Acemoglu and Restrepo (2018) argue that automation may displace labor without adequate reskilling policies, potentially exacerbating income inequality.

In the Indian context, digital public infrastructure (DPI) has been identified as a foundational enabler of inclusive growth (NITI Aayog, 2018). The World Bank (2021) highlights India's digital ID and payment infrastructure as models for scalable inclusion, particularly in emerging economies.

- **FinTech and Financial Inclusion**

FinTech represents the convergence of finance and digital technology, reshaping banking, lending, insurance, and capital markets. Arner, Barberis, and Buckley (2016) describe FinTech as technology-enabled financial innovation that enhances accessibility and operational efficiency. Post-2008 financial crisis regulatory reforms encouraged innovation through regulatory sandboxes and open banking frameworks.

Studies show that digital payment platforms reduce transaction costs and enhance credit accessibility for micro and small enterprises (IMF, 2022). Mobile banking and digital wallets increase financial participation among unbanked populations (Demirgüç-Kunt et al., 2021). In India, UPI-based ecosystems have significantly expanded digital transactions, fostering a cash-light economy.

However, Zetzsche et al. (2017) caution against regulatory arbitrage and systemic risks associated with decentralized financial technologies. Cybersecurity vulnerabilities and digital fraud remain pressing concerns.

- **Smart Governance and Digital Public Administration**

Smart governance integrates ICT and AI tools to improve public administration efficiency and citizen engagement. Meijer and Bolívar (2016) conceptualize smart governance as collaborative, data-driven governance that enhances transparency and accountability. AI-based predictive analytics assist in taxation compliance, public health management, and welfare targeting.

Margetts and Dorobantu (2019) argue that digital-era governance shifts the focus from bureaucratic hierarchies to platform-based service delivery models. In India, digital governance platforms such as Aadhaar-enabled direct benefit transfers (DBT) have reduced leakages and improved policy precision.

Despite efficiency gains, scholars warn of surveillance risks and data misuse. Floridi et al. (2018) emphasize the need for ethical frameworks to prevent misuse of AI in governance.

- **Artificial Intelligence Ethics**

AI ethics has emerged as a critical discourse in global governance. Jobin, Ienca, and Vayena (2019) analyze global AI guidelines and identify common principles: transparency, justice, non-maleficence, responsibility, and privacy. Floridi et al. (2018) propose the AI4People framework advocating beneficence and explicability in AI systems.

Algorithmic bias poses risks of discrimination in credit scoring, recruitment, and law enforcement. O'Neil (2016) highlights how opaque algorithms can perpetuate inequality. Therefore, explainable AI (XAI) and accountable data governance mechanisms are crucial for responsible innovation.

• **Sustainability and Digital Transformation**

Digital transformation intersects with sustainability through green finance, ESG investing, and climate analytics. The United Nations (2015) Sustainable Development Goals (SDGs) emphasize inclusive innovation and environmental protection. ESG-integrated finance encourages sustainable capital allocation.

However, AI systems require significant energy consumption through data centers. Strubell et al. (2019) note the carbon footprint associated with large-scale machine learning models. Thus, green digital infrastructure and renewable-powered data centers are vital for sustainable digital economies.

Objectives

- To evaluate the contribution of the digital economy and FinTech ecosystems in fostering inclusive and sustainable economic growth in India toward Viksit Bharat 2047.
- To examine how AI ethics and smart governance frameworks can ensure responsible, transparent, and environmentally sustainable digital transformation.

Research Methodology

This research employs a mixed-method approach combining qualitative policy analysis and quantitative secondary data evaluation. Data sources include World Bank Global Findex data, IMF digital finance reports, RBI statistics on digital payments, and NITI Aayog AI strategy documents from 2015 to 2024.

Descriptive statistical analysis is used to assess trends in digital payments, financial inclusion, and digital adoption rates. Thematic analysis is applied to AI ethics frameworks and sustainability reports. Comparative case analysis evaluates India's digital public infrastructure relative to global best practices.

Data Analysis and Interpretation

India's digital payment ecosystem has grown exponentially. RBI data indicate that overall digital transactions jumped ~38-fold in volume from 2014 to 2024. Mobile platforms, especially the Unified Payments Interface (UPI), have driven this surge – UPI usage expanded roughly 160% annually (reaching 5.86 billion transactions by June 2023). By 2025, UPI alone accounted for about 85% of all retail transactions by number, underscoring its dominance for everyday payments. These trends reflect India's deepening digital infrastructure (smartphone/internet penetration and Aadhaar-based ID verification) and pro-innovation policies (e.g. RBI's "regulated innovation" in payments). In practice, the payment ecosystem now handles almost all transactions digitally (cards, NEFT/RTGS, wallets, QR codes etc.), a transformation that has taken place across urban and rural markets alike.

Digital payment adoption has been accompanied by marked improvements in financial inclusion. For instance, RBI's Financial Inclusion Index rose to 67.0 by March 2025 (up 24% since 2021), corresponding to roughly 89% of adults holding a financial account. World Bank Global Findex analysis shows that once individuals begin receiving digital payments (e.g. government transfers or wages into an account), the vast majority immediately use those accounts for further transactions: about 83% of account holders who receive a payment digitally then make a digital payment themselves, and roughly two-thirds go on to save or borrow through that account. Global Findex data (Demirgüç-Kunt et al., 2021) shows significant improvement in account penetration and digital transaction frequency, particularly among women and rural populations. The interpretation suggests that FinTech reduces geographic and socio-economic barriers to financial participation.

In other words, **"digital inflows pave the way for wider use of financial services."** This suggests that fintech solutions are lowering geographic and socio-economic barriers: rural residents or low-income users who get linked into formal digital payments often continue to use the same infrastructure (mobile wallets, AePS, UPI-linked accounts) for saving, payments, and credit. In effect, innovations like Aadhaar-enabled e-KYC, Jan Dhan zero-balance accounts, and interoperable UPI rail have converted one-time onboarding into sustained formal financial engagement, aiding MSMEs and women entrepreneurs to participate in the digital economy.

AI-driven Governance Improvements

AI-driven initiatives across health and public services demonstrate how smart governance can boost efficiency. For example, Indian health programs have integrated AI tools into disease screening and telemedicine. AI-based triage in the National TB Elimination Programme enabled community health workers to flag high-risk patients early, contributing to a reported ~27% decline in adverse TB treatment outcomes. Likewise, the government's eSanjeevani telemedicine platform – equipped with AI-assisted

differential diagnosis – handled 282 million remote consultations from April 2023 to Nov 2025, with about 12 million cases supported by AI-generated diagnostic suggestions. These AI-enhanced services have extended specialist-level care into rural and underserved areas with no resident doctors, effectively democratizing expertise. In public finance, similar data-driven tools are applied: AI algorithms can now automatically flag suspicious transactions in tax filings or customs declarations, enabling revenue authorities to detect fraud, under-reporting, and non-compliance far more efficiently than traditional audits. AI integration in governance—such as predictive analytics for tax compliance and digital health management—demonstrates improved efficiency and reduced administrative costs. However, data breaches and algorithmic bias cases underscore the necessity of robust AI governance mechanisms.

Overall, predictive analytics and automated processes in governance are freeing officials from routine tasks, reducing errors and delays, and improving transparency in areas from welfare delivery to urban planning.

Ethical and Sustainability Considerations

These gains come with important risks. Algorithmic bias and data privacy are major concerns. AI systems trained on historical data can inherit social prejudices: for instance, commercial facial-recognition software has been shown to misidentify darker-skinned and female faces at much higher error rates, due to unbalanced training datasets. As Cathy O’Neil warns, opaque algorithms can thus “**perpetuate inequality under the guise of scientific neutrality**”. In the Indian context, indiscriminate use of algorithms for credit scoring, job screening, or subsidy targeting could similarly disadvantage marginalized groups unless explicitly audited. Data breaches are also a threat: India’s Aadhaar ID system and digital health records have faced security lapses, highlighting the need for robust encryption and consent frameworks. Experts emphasize that over-reliance on automation can erode public trust if not carefully managed – for example, fully digital service channels might exclude citizens lacking internet or digital literacy, so offline alternatives and human support must be preserved. In sum, ethical AI governance requires transparency, accountability, and human oversight so that gains in efficiency do not come at the cost of equity or privacy.

Finally, environmental sustainability imposes another constraint. The computing power behind AI and big data is energy-intensive. Training one state-of-the-art neural language model has been estimated to generate on the order of **0.2 to 0.6 million pounds of CO₂** – equivalent to the total lifetime emissions of several average cars. As India’s digital footprint (data centers, cloud services, crypto-mining, etc.) expands, the carbon footprint of the economy can rise unless green measures are adopted. This analysis suggests that India must couple its digital push with renewable energy and efficiency standards for infrastructure. For example, powering public cloud servers with solar/wind and using low-power hardware can mitigate the carbon cost of AI. In conclusion, while AI-driven fintech and e-governance platforms are key drivers of inclusive growth, they must be deployed under ESG-aligned strategies. Environmental sustainability analysis reveals increasing energy demand from data centers, necessitating green infrastructure strategies. Embedding ethical safeguards and clean-tech in India’s digital agenda will help ensure that the transformation toward *Viksit Bharat 2047* is equitable and environmentally sustainable.

Findings

India’s digital economy has surged (digital transactions up ~38×, UPI now ~85% of volume), driving account ownership to ~89%. This FinTech wave is broadening financial inclusion (once users receive digital payments, 83% make further digital transactions). AI-enabled governance (e.g. predictive health screening, AI-assisted telemedicine and tax compliance) is yielding measurable efficiency gains (TB deaths –27%, millions of tele-consults handled). However, unchecked AI can propagate bias, privacy vulnerabilities, and high energy use. Careful policy design is needed to lock in the benefits while safeguarding equity and sustainability.

The analysis reveals that digital public infrastructure is a foundational driver of inclusive economic expansion. FinTech ecosystems enhance credit access and MSME growth. AI-enabled governance improves transparency and service efficiency. However, ethical and sustainability challenges must be systematically addressed through regulatory frameworks and ESG integration.

Summary and Conclusion

The pathway toward *Viksit Bharat 2047* requires a paradigm shift in management and governance models anchored in ethical AI and sustainability principles. Digital economy expansion and

FinTech innovation offer transformative potential for inclusive growth. However, responsible AI governance frameworks must mitigate risks related to privacy, bias, and environmental impact.

An integrated policy architecture combining adaptive regulation, sustainable digital infrastructure, AI ethics oversight, and inclusive financial ecosystems will ensure that technological advancement aligns with social equity and environmental stewardship. India's digital transformation, if guided by ethical and sustainability frameworks, can serve as a global benchmark for responsible economic modernization.

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