

Role of Artificial Intelligence in Accelerating Digital India: A Pathway Towards Viksit Bharat 2047

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ABSTRACT

Becoming a developed nation by 2047 sits at the heart of India's current policy imagination. A decade of Digital India investment has wired up much of the country's infrastructure -but wiring alone does not guarantee outcomes. The real test, which this paper takes seriously, is whether artificial intelligence can do what the digital backbone alone cannot: turn connectivity into livelihoods, governance into accountability, and data into decisions that reach ordinary Indians.

Through a conceptual literature review spanning government policy documents, academic journals, and industry analyses, this paper traces AI deployment across four sectors -agriculture, healthcare, education, and financial services -and asks whether what is happening on the ground matches what is promised on paper. The IndiaAI Mission launched in 2024, NITI Aayog's long-running AI strategy, and homegrown initiatives like BharatGen and AIKosh all point to genuine state commitment.

What this paper offers is a mapping framework -one that holds AI's capabilities against Viksit Bharat's four development pillars: economic prosperity, social advancement, environmental sustainability, and governance effectiveness. The argument is not that AI will fail India, but that its success is not automatic. It depends on decisions -about design, access, and accountability -that are yet to be made.

Keywords: Artificial Intelligence, Digital India, Viksit Bharat 2047, IndiaAI Mission, Inclusive Development, Economic Growth

1. INTRODUCTION

In 2025, Stanford University ranked India third globally in AI competitiveness. That is a striking number for a country where half the working population earns its living outside the formal economy and where millions of villages still experience intermittent or no internet connectivity. Both facts are true simultaneously. That coexistence -world-class AI infrastructure alongside persistent structural underdevelopment -is the central tension this paper works through.

The Digital India programme, which began in 2015, laid the groundwork: Aadhaar for identity, UPI for payments, DigiLocker for documents, and steadily expanding broadband coverage. These are not trivial achievements. Together they constitute a Digital Public Infrastructure (DPI) that gives India something most comparable economies lack -a unified, interoperable delivery system through which services, including AI-powered ones, can reach citizens at scale. When the government approved the IndiaAI Mission in March 2024, allocating ₹10,371.92 crore across five years and seven operational pillars, it was building on this foundation deliberately (MeitY, 2024).

The economic argument for AI investment is rehearsed often. McKinsey Global Institute puts AI's total economic impact globally at \$15.7 trillion by 2035, with India positioned to capture a meaningful share of that (Panigrahi et al., 2024). NASSCOM's estimate is more India-specific: \$967 billion added to domestic GDP by 2035, and 400,000 jobs by 2025 (Panigrahi et al., 2024). NITI Aayog (2025) is even more direct, linking 8% sustained growth explicitly to the pace of AI adoption.

What the literature has not done -at least not in an integrated way -is examine AI's economic, policy, and social dimensions together, and hold all three against the specific benchmarks of Viksit Bharat 2047. Most studies pick one dimension and work it thoroughly. This paper attempts the synthesis, identifying where the evidence is solid, where it is speculative, and where the gaps between intention and delivery are most likely to determine the outcome.

2. REVIEW OF LITERATURE

2.1 AI and India's Economic Trajectory

The economic evidence on AI's potential in India is real, but it requires more careful handling than it usually receives. Panigrahi et al. (2024) conduct the most India-focused examination, looking at how AI shapes GDP growth, employment creation, and management practice. The \$15.7 trillion global impact figure they cite comes from McKinsey Global Institute, and the 400,000 jobs projection is NASSCOM's. Both numbers get repeated widely across policy documents and media coverage -which is itself worth noticing. A large portion of India's AI economic narrative circulates a small cluster of consulting firm estimates rather than growing from independent academic research with Indian data. Trabelsi (2024) takes a more theoretical approach, situating AI within standard growth economics and arguing that AI-driven productivity gains come primarily from faster, more accurate processing of large datasets. The framework is useful. The caveat is that it is built on evidence from high-income, digitally mature economies. Whether it translates to an economy where the majority of workers are informal, where much economic activity is unrecorded, and where digital infrastructure is patchy in rural areas -that translation problem is acknowledged but not resolved.

Matamoros-Echeverria et al. (2025) bring a systematic review methodology to the question of AI's impact on digital economies, finding consistent evidence of efficiency gains and process automation. They also report a projected 40% increase in labor productivity through digitalization. However, their review is bounded by what appears in Scopus and Web of Science between 2021 and 2025. The grey literature that would tell us what is actually happening in Indian state-level AI pilots, NGO digital programmes, and informal sector experiments is outside their scope.

2.2 Policy Frameworks and Government Initiatives

India's AI policy journey can be read in three chapters. The first opened in 2018 with NITI Aayog's National Strategy for Artificial Intelligence, operating under the 'AI for All' banner. Five priority sectors were named -healthcare, agriculture, education, smart cities, smart mobility -and the document established the framing and vocabulary for everything that followed. It was more vision than plan, but visions set the terms of subsequent debates.

The second chapter came in 2023 with the Digital Personal Data Protection Act. The DPDPA did not target AI directly, but it addressed the data governance gap that the 2018 strategy had left open. How personal data flowing through AI systems should be collected, stored, and used now has a legal answer in India -which is more than could be said before.

The third chapter, which we are currently in, is the IndiaAI Mission. Approved in March 2024 with a ₹10,371.92 crore allocation over five years, it covers seven pillars: compute infrastructure (38,000 GPUs as of early 2025), an Innovation Centre for foundational model development, AIKosh as the national dataset repository (3,000+ datasets, 243 AI models, 20 sectors), FutureSkills for education, Startup Financing, and a Safe & Trusted AI pillar for responsible governance (Press Information Bureau, 2025). BharatGen -India's first government-funded multimodal large language model, trained on Indian data and supporting 22 Indian languages -came out of this mission (AIKosh, n.d.).

Rehman et al. (2025), reviewing AI's relationship to higher education in the Viksit Bharat context, find that institutional response has been uneven. Elite institutions -the IITs, IIMs, NITs -have moved. The much larger universe of Tier 2 and Tier 3 colleges, which educates the majority of Indian students, has not kept pace. The policy framework is ambitious. The institutional reach is still catching up.

2.3 Inclusivity Gaps and Adoption Barriers

The hardest problem in India's AI story is not a technology problem. NITI Aayog's 2025 report on AI for Inclusive Societal Development puts it plainly: 490 million informal workers face a real risk of being bypassed by AI-driven economic growth. Farmers, construction workers, domestic helpers, street vendors -the people who make up the majority of India's actual working population -encounter three overlapping barriers when it comes to AI access. Their digital access is unreliable or absent.

Their AI literacy is close to zero. And the tools that do exist were not built with them in mind: they assume English fluency, smartphone ownership, and consistent internet connectivity.

Panigrahi et al. (2024) flag the talent dimension separately. India's demand for AI professionals is heading toward one million by 2026. The supply from current educational pipelines is a fraction of that. This matters not only for the tech sector but for every sector that needs AI-skilled staff to actually deploy the systems being funded at the national level.

Matamoros-Echeverria et al. (2025) bring the governance gap into the picture. Without standardized regulatory frameworks, there is no reliable way to audit AI systems for fairness, hold them accountable for errors, or protect workers from automated decisions that disadvantage them. India's DPDPA handles personal data. It does not handle algorithmic bias in hiring, automated credit denial, or AI-assisted medical triage gone wrong. The governance vacuum is not abstract -it touches areas where AI deployment is already live and growing.

3. OBJECTIVES OF THE STUDY

This study pursues three defined objectives:

1. To examine how AI is being deployed across agriculture, healthcare, education, and financial services, and evaluate how well those deployments serve the Viksit Bharat 2047 agenda.
2. To identify the structural barriers -infrastructure inequality, governance gaps, talent shortfalls -that constrain inclusive AI adoption across India.
3. To build a conceptual framework that maps AI's current and projected capabilities against Viksit Bharat's four core pillars, giving policymakers and researchers a structured tool for evaluation.

4. HYPOTHESIS OF THE STUDY

H₀: Artificial intelligence does not significantly shape India's economic development path or the achievement of Viksit Bharat 2047 targets.

H₁: When AI is integrated deliberately across key sectors and anchored in inclusive governance, it meaningfully accelerates India's economic growth, social progress, and movement toward the Viksit Bharat 2047 vision (Trabelsi, 2024; Rehman et al., 2025).

5. METHODOLOGY

This paper employs a conceptual literature review, organized along the systematic review principles described by Matamoros-Echeverria et al. (2025). The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework guided the process of source identification, screening, and thematic synthesis (Rehman et al., 2025).

Search terms included combinations of: 'Artificial Intelligence,' 'Digital India,' 'Viksit Bharat,' 'AI economic impact,' 'IndiaAI Mission,' and 'inclusive development.' The source pool covered peer-reviewed journals in Scopus and Web of Science, official policy documents from NITI Aayog and MeitY, and industry reports from NASSCOM, McKinsey, and BCG. The review period runs from 2018 -when India's formal AI policy began -through 2025.

Rather than cataloguing sources one by one, the paper organises the literature into three thematic clusters: economic impact evidence, policy and governance frameworks, and inclusivity and adoption barriers. This structure keeps the review anchored to the paper's conceptual framework rather than becoming a bibliographic exercise.

6. CORE FINDINGS AND ANALYSIS

6.1 AI Across Key Sectors

Agriculture is where the stakes are highest. Contributing around 18% of GDP and employing nearly half of India's workers, it is the sector where AI's development dividend could be most transformative. Rana (2025) documents active deployments: image recognition systems that catch crop disease before it spreads, AI-driven weather and irrigation models that help farmers make better decisions with less water, and KissanGPT, which delivers agronomic advice in regional languages to farmers who would never access a government extension service. The National Pest Surveillance System and Crop Health Monitoring platforms -integrating satellite imagery and climate data -extend this further (Press Information Bureau, 2025).

Healthcare tells a similar story of genuine progress with unresolved reach problems. Rana (2025) points to AI-assisted diagnostics that improve accuracy in under-resourced settings, telemedicine platforms that carry specialist knowledge into rural areas, and the Bhashini translation system, which makes health information available in more than 36 Indian languages. The language barrier alone has historically excluded hundreds of millions from accessing health services effectively.

In education, Rehman et al. (2025) identify AI's potential to personalise learning and reduce administrative burden -but note that potential and reality remain some distance apart. The IndiaAI FutureSkills programme has brought 13,500 scholars into AI training as of 2025, and NIELIT is establishing AI Data Labs in Tier 2 and Tier 3 cities. Against a system of 1,000+ universities and 40,000+ colleges, these are early steps -meaningful, but early.

6.2 The AIKosh Dataset Platform

AIKosh is one of the more concrete outputs of the IndiaAI Mission. Holding over 3,000 datasets and 243 AI models across 20 sectors (AIKosh, n.d.; Press Information Bureau, 2025), it functions as India's national repository for AI training data. What makes it significant is not just the volume but the specificity. The Kisan Call Centre dataset, for instance, captures real questions from real farmers -organized by district and month -along with the answers provided by Field Technology Assistants. That is a resource that lets AI systems learn from actual Indian agricultural problems rather than from generic international datasets.

7. CONCEPTUAL FRAMEWORK: MAPPING AI TO VIKSIT BHARAT'S FOUR PILLARS

The framework this paper proposes does not argue that AI will deliver on Viksit Bharat. It maps where evidence exists, where it is thin, and where structural work still needs to happen. Four pillars, four honest assessments.

Pillar 1: Economic Prosperity

The economic contribution of AI is the best-documented of the four. Productivity gains in formal sector firms, a startup ecosystem supported by 520+ incubators, and the IndiaAI Startup Financing pillar all represent real activity (Panigrahi et al., 2024; Trabelsi, 2024). The gap is the informal economy. Neither Panigrahi et al. nor Trabelsi address it directly, and the productivity models they draw on were not built for it. The biggest distance between projected impact and likely actual impact lives here.

Pillar 2: Social Advancement

Bhashini's multilingual reach, UPI's AI-assisted financial services, and AI-driven diagnostics in rural healthcare are all functioning contributions to social advancement. Rana (2025) documents them across sectors. But 490 million informal workers who lack consistent internet, affordable smartphones, or the literacy to navigate existing AI interfaces represent a ceiling on how far these contributions currently extend. Policy ambition and ground-level access are not yet aligned.

Pillar 3: Environmental Sustainability

This is where AI's contribution to Viksit Bharat is thinnest. KissanGPT, crop monitoring, climate forecasting -these are real tools with real uses. Smart city projects in Bangalore and Mumbai incorporate AI-powered resource management. But they remain urban and experimental rather than

scaled and national. Environmental sustainability has not yet been treated as a first-order AI deployment priority in India, and the framework notes that honestly.

Pillar 4: Governance Effectiveness

Governance is where AI has been deployed most consistently. DigiYatra, the multilingual chatbots managing crowds at Mahakumbh 2025, e-court systems, and predictive analytics in public administration are all functioning (Press Information Bureau, 2025). The concern here shifts from deployment to accountability. AI governance in India currently lacks a law that addresses what happens when these systems get things wrong -when they discriminate, when their decisions are opaque, when there is no mechanism for redress.

8. DISCUSSION

Three observations emerge from reading this literature as a whole -none of them stated explicitly by any single source, but each supported by the evidence across sources.

The first is about pace and reach. India's AI policy has moved faster in the last three years than almost any comparable national context. The jump from the 2018 NITI Aayog strategy paper to a ₹10,000+ crore funded mission with 38,000 GPUs and a functioning national model is substantial. What has not kept pace is the last mile. The subsistence farmer in Vidarbha and the unregistered garment worker in Tiruppur are not yet in the story. That gap, between what the mission has built and who it currently serves, is widening rather than narrowing.

The second observation is about the numbers. The USD 1.7 trillion and USD 500 billion figures that circulate through this discourse assume an economy-wide AI diffusion that India's current infrastructure does not support. Matamoros-Echeverria et al. (2025) and Trabelsi (2024) both build their productivity arguments on digital baseline conditions that are not uniformly present in rural India. Citing these projections without that caveat is not optimism -it is planning on the basis of a scenario that has not yet been built.

The third observation, more hopeful, is about what India already has. Aadhaar, UPI, and DigiLocker are not just administrative systems -they are delivery infrastructure. Bhashini, the AIKosh Kisan dataset, and BharatGen's multilingual capability all demonstrate that AI can be built to travel through that infrastructure rather than around it. Most global AI strategies have no equivalent of India's DPI layer -India has it, and currently underuses it.

Whether AI deepens India's development inequalities or begins to close them is not a technology question. It is a governance and design question -one that the choices made between now and 2030 will largely answer.

9. LIMITATIONS OF THE STUDY

1. The review draws primarily from Scopus and Web of Science indexed publications. Government programme evaluations, state-level AI pilots, and NGO-led digital initiatives operating outside formal publication channels are largely absent from the evidence base (Matamoros-Echeverria et al., 2025).
2. The 2018–2025 timeframe, while capturing the full span of India's formal AI policy, means that developments from late 2025 onward -a period of rapid change -are not reflected.
3. As a conceptual literature review, no primary data was generated. All projections and sector findings derive from secondary sources with their own assumptions embedded (Matamoros-Echeverria et al., 2025; Rana, 2025).
4. The reviewed studies do not share a common methodological framework, which limits direct comparison of findings across contexts (Matamoros-Echeverria et al., 2025).

10. SCOPE FOR FUTURE RESEARCH

1. India needs empirical studies -not consultant projections -measuring AI's actual contribution to GDP, with particular attention to informal sector dynamics that existing models ignore.
2. Longitudinal tracking of AI's effect on informal employment would give policymakers designing skilling and protection programmes something to work with beyond current anecdotal evidence.
3. Research examining how the DPDPA (2023) performs against AI-specific risks -algorithmic bias, opaque automated decisions, platform-driven worker displacement -would inform the governance law that India still needs (Matamoros-Echeverria et al., 2025).
4. Comparative work on how Brazil, Indonesia, and Nigeria -all with large informal economies and growing DPI investments -are navigating AI adoption could offer India concrete lessons rather than high-income country models (Matamoros-Echeverria et al., 2025).

11. CONCLUSION AND RECOMMENDATIONS

India's AI momentum is real. The IndiaAI Mission, BharatGen, AIKosh, and the active deployment of AI in agriculture, healthcare, education, and governance represent a national commitment that goes beyond announcement. Panigrahi et al. (2024), Rana (2025), and Press Information Bureau (2025) together describe an ecosystem that is genuinely growing.

But Viksit Bharat 2047 was never designed for India's top income quintile. It is a developed-country vision for 1.4 billion people -including the 490 million informal workers that NITI Aayog (2025) identifies as currently at risk of being left out of AI-driven growth. The distance between India's AI capability and its inclusive delivery is the central problem this paper has traced.

Three recommendations follow from this analysis:

1. Take AI education to where most Indians actually study. NIELIT Data Labs in Tier 2 and Tier 3 cities, connected to AIKosh's open datasets, are the scalable path. Demand for one million AI professionals by 2026 will not be met through IIT pipelines alone.
2. Give the DPDPA a successor that handles what data privacy law cannot: algorithmic accountability, bias redress, and worker protection in an AI-mediated economy. The foundation exists. It is not sufficient.
3. Build AI for the informal sector -not as an afterthought but as a design requirement. Offline capability, vernacular interfaces, low-literacy accessibility, built on BharatGen's language infrastructure. If the tool requires uninterrupted broadband and an Android smartphone to function, it will not reach the people Viksit Bharat is actually about.

AI will not guarantee Viksit Bharat. But designed and governed well, it could be the most powerful instrument India has for getting there. The technology exists. The infrastructure is being built. What remains is the harder work of making sure both reach everyone they are meant to.

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