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Digital Transformation for a Developed India: The Role of Artificial Intelligence and Emerging Technologies in Achieving Viksit Bharat 2047

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ABSTRACT

The ambitious national vision of "Viksit Bharat 2047", articulated by the Government of India, charts a definitive roadmap to transform the nation into a developed economy by the centenary of its independence. This comprehensive development strategy is fundamentally intertwined with the principles of the Digital India Programme, aiming to harness technology as a core lever for inclusive growth and global competitiveness. The vision rests upon five strategic pillars: achieving universal digital empowerment and literacy among citizens; developing world-class, future-ready infrastructure to foster innovation and service delivery; systematically skilling the youth in cutting-edge domains such as Artificial Intelligence (AI) and Automation; establishing robust cybersecurity frameworks and data protection regimes; and expanding India's leadership in technological research and development. The realization of this vision is increasingly dependent on the strategic deployment of Artificial Intelligence and other emerging technologies across critical sectors of the economy and society.

This paper examines the transformative role and potential impacts of AI in key sectors aligned with the Viksit Bharat goals. In the healthcare sector, AI applications in predictive analytics, diagnostic imaging, and accelerated drug discovery are revolutionizing medical outcomes, enabling earlier disease detection, personalized treatment plans, and expanding access to remote healthcare through advanced telemedicine solutions. Within agriculture, AI-driven tools for smart irrigation, precision farming, and predictive crop analytics are enhancing productivity and sustainability. These innovations facilitate higher crop yields, significant reduction in resource waste, and real-time, data-informed farm management, thereby strengthening food security and

farmer livelihoods. The finance and banking sector is being reshaped by AI through sophisticated algorithms for real-time fraud detection, automated risk assessment, and the delivery of hyper-personalized banking services.

In conclusion, achieving the milestone of Viksit Bharat by 2047 necessitates a paradigm shift from digital adoption to deep digital transformation, with AI and emerging technologies at its core. This journey requires sustained investment not only in technology itself but also in the foundational enablers: comprehensive digital infrastructure, large-scale capacity building, and forward-looking policy frameworks. By strategically integrating AI across sectors, India can accelerate its development trajectory, enhance global competitiveness, and ultimately ensure that the benefits of technological progress are inclusive, sustainable, and widely shared across all strata of society.

Keywords: Viksit Bharat 2047, Digital Transformation, Artificial Intelligence (AI), Emerging Technologies and Comprehensive Development.

1. INTRODUCTION

Context and Vision

Viksit Bharat 2047 embodies the Government of India's ambitious vision to transform the nation into a fully developed country by the centenary of its independence. Central to this vision is digital transformation driven by Artificial Intelligence (AI) and other emerging technologies which serves as a catalyst for inclusive, sustainable, and innovation-led growth.

Strategic Framework

The Viksit Bharat strategy is comprehensive, spanning critical domains such as infrastructure, governance, healthcare, finance, education, mobility, and agriculture. Initiatives like the Digital India program, launched in 2015, form foundational pillars by advancing digital literacy, broadband connectivity, e-governance, and public access to digital services. This digital roadmap aims to elevate India's GDP to an estimated \$25–35 trillion by 2047.

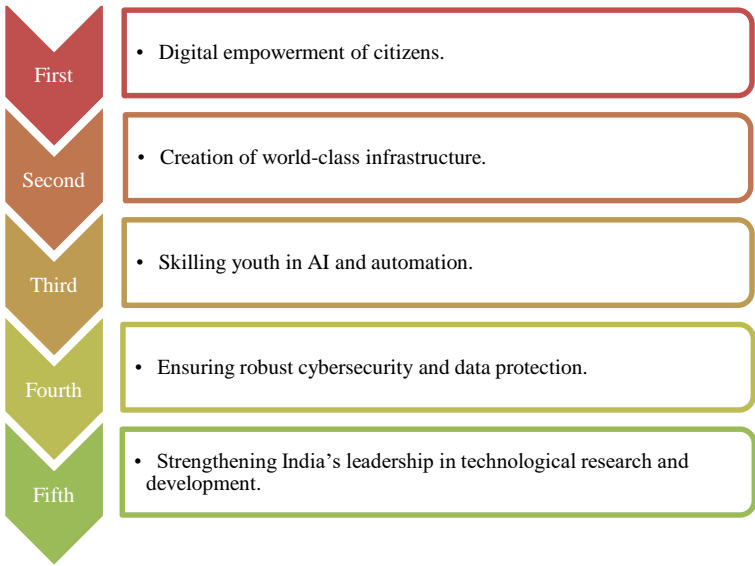


Figure 1: Five Strategic Pillars of Digital Transformation
Source: Author Compiled

Role of Artificial Intelligence in National Development

Artificial Intelligence acts as a transformative force across multiple sectors. Economically, AI is projected to contribute \$450–500 billion to India's GDP by 2025, potentially reaching \$967 billion by 2035. The AI-driven job market has seen annual growth exceeding 15%, supported by substantial investments such as the ₹10,300-crore India AI Mission. Key initiatives include establishing Centers of Excellence, developing foundational AI models, and launching the India AI Dataset Platform—the nation's largest repository of non-personal data.

AI is increasingly integrated into public infrastructure and digital services

Including Aadhaar, UPI, DigiLocker, and e-governance systems improving efficiency and accessibility. In sector-specific applications such as healthcare, agriculture, finance, education, and governance, AI enables predictive diagnostics, precision farming, fraud detection, and adaptive learning environments.

Strategic Supportive Technologies: AI is supported and amplified by other emerging technologies, such as:

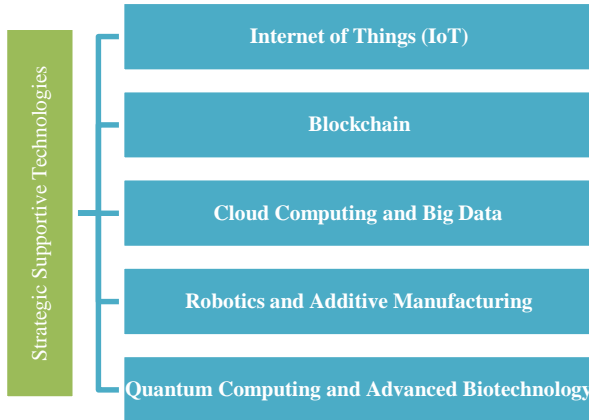


Figure 2: Strategic Supportive Technologies
Source: Author Compiled

- Internet of Things (IoT): Enables connected infrastructure and smart urban and rural services.
- Blockchain: Enhances transparency and traceability in transactions and governance.
- Cloud Computing and Big Data: Facilitate scalable service delivery and innovation.
- Robotics and Additive Manufacturing: Boost automation and manufacturing competitiveness.
- Quantum Computing and Advanced Biotechnology: Drive next-generation scientific research and innovation.

Challenges and Human Capital Development

Despite significant progress, India faces challenges such as the digital divide between urban and rural populations. Government programs like BharatNet aim to bridge this gap. Concurrently, investments in human capital through the National Education Policy (NEP) 2020 and targeted AI skilling programs are essential to prepare the workforce for an innovation-driven economy. Ensuring ethical technology use, safeguarding data privacy, and maintaining AI safety remain central to the responsible deployment of emerging technologies.

Alignment with Viksit Bharat 2047 Goals

The integration of AI and emerging technologies aligns with the core objectives of Viksit Bharat 2047 by:

- Enhancing productivity across sectors such as agriculture, manufacturing, logistics, fintech, and MSMEs.
- Transforming governance and public service delivery through AI-enabled platforms.
- Promoting inclusive growth by reducing digital and regional disparities.
- Supporting sustainable development via green technologies, smart cities, and efficient resource management.

2. LITERATURE REVIEW

1. Prof. (Dr.) Jagdev Singh Rana (2025), in his research paper titled 'Study on the Significance: The Role of Artificial Intelligence in the Development of India for Achieving the Goal of Viksit Bharat@2047', has discussed that Artificial Intelligence has the potential to make India economically stronger by 2047. Further, they said that Artificial Intelligence has played a major role in different sectors such as infrastructure, healthcare, education, and agriculture. Apart from this, Artificial Intelligence is also useful in addressing data protection, talent development, and ethical considerations. Lastly, the Artificial Intelligence researcher also suggested that the long-term goals of Viksit Bharat 2047 can be achieved by applying advanced technology towards national development goals.

2. Dr. Kavita Gupta and Jyoti (2025), in their research paper titled 'In Shaping Developed India 2047: Sustainable and Inclusive Development', explained that Prime Minister Shri Narendra Modi presented a visionary framework for transforming India into a developed nation by the 100th year of its independence in 2047. Further, they discussed that the Government of India has identified five pillars for this vision, such as an empowered citizenry, a flourishing and sustainable economy, advancements in science and technology, effective governance, and strengthening India's position in the global economy. This research paper also highlights the need for inclusive economic engagement, innovation, and the development of human capital for achieving the goal of Viksit Bharat. Apart from these, the researchers have also described various challenges and opportunities faced by India, such as economic inequalities. The opportunities include improving

infrastructure, encouraging sustainable practices, and ensuring accountable governance. This study concludes that digital transformation has played an important role in India's growth. In India is helpful in realizing the vision of Viksit Bharat. The study's analysis is also useful in providing guidance to policymakers, stakeholders, and researchers for achieving the goals of Viksit Bharat 2047.

3. Arpita Nagpal and Sania Kakkar (2024), in their research paper titled 'Artificial Intelligence Can Act as a Catalyst for Viksit Bharat', explained that the Viksit Bharat 2047 plan includes making India a developed nation by 2047 with the help of Artificial Intelligence. According to them, Artificial Intelligence impacts the following sectors, such as digital governance, education, agriculture, and public welfare. Artificial Intelligence supports the DigiYatra application in streamlining aviation processes and is also useful in increasing educational productivity, providing real-time translation, and mitigating geographical and linguistic barriers. Furthermore, regarding sector-specific tools, they stated that KissanGPT supports agriculture by providing necessary information to farmers, while PolicyGPT helps in understanding complex health insurance policies for consumers and in government initiatives such as 'Pradhan Mantri Garib Kalyan Anna Yojana' and 'One Nation One Ration Card', improving service delivery and managing resources efficiently. In addition, Artificial Intelligence helps bridge the skill gap in the job market and is also associated with a predicted 40% increase in roles related to Artificial Intelligence and Machine Learning by 2027, according to the World Economic Forum. Lastly, the researchers concluded that advanced technologies help in achieving national development goals and also in realizing the vision of Viksit Bharat 2047.

3. RESEARCH METHODOLOGY

To make the present study scientific, the researcher would like to use following Research Design:

- Collection of Data- This study is primarily based on primary data. This primary data has been collected from the officials of various departments of government, academician and researchers.
- Scope- It encompasses an in-depth analysis of how digital technologies particularly Artificial Intelligence are reshaping key sectors such as governance, healthcare, agriculture, education, and finance to support India's transformation into a developed nation by

2047. It covers the evaluation of national policies, initiatives like Digital India and the India AI Mission, and the integration of emerging technologies such as IoT, blockchain, cloud computing, and robotics in public service delivery and infrastructure. The study also explores the socio-economic impact of digital inclusion, human capital development, and ethical considerations, while identifying challenges such as the digital divide and data security that influence the pace and effectiveness of this transformation.

- Duration- This study based on data from 2024 to 2025.

Need of the study

It arises from the growing imperative to understand how digital transformation, powered by artificial intelligence (AI) and emerging technologies, can serve as a catalyst for achieving the ambitious national vision of Viksit Bharat 2047. A fully developed India by its centenary of independence. As India navigates complex socio-economic challenges and aspires to enhance governance, industrial productivity, education, and public service delivery, the integration of AI-driven innovation becomes central to sustainable and inclusive development. Despite various government initiatives and technological advancements, there exists a critical research gap in evaluating the strategic deployment, societal impact, and policy implications of digital transformation at a national scale. This study seeks to address that gap by providing evidence-based insights into how emerging technologies can be effectively harnessed to accelerate progress toward a developed India.

Research Objectives

This study aims to:

- Analyze the contribution of Artificial Intelligence and emerging technologies to India's digital economy.
- Evaluate key government initiatives facilitating digital transformation toward Viksit Bharat 2047.
- Examine sector-specific applications of AI in healthcare, education, governance, and agriculture.
- Identify key challenges and limitations in the adoption of these technologies at the grassroots level.

4. ANALYSIS AND INTERPRETATION

Respondent Demographics

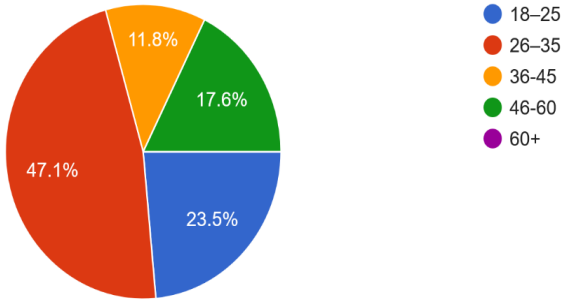


Figure 3: Demographic Analysis
Source: Author Compiled

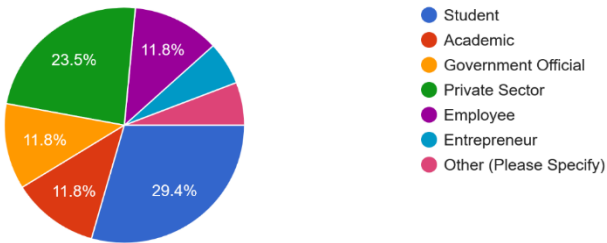


Figure 4: Demographic Analysis
Source: Author Compiled

Interpretation:

- Age: The majority (41.2%) of respondents are young adults (18-30 years), indicating a digitally native perspective. A significant portion (35.3%) is middle-aged (31-50), providing a mature, professional viewpoint. The sample lacks strong representation from the 50+ age group.
- Gender: The respondent pool is predominantly male (88.2%). This significant gender imbalance limits the generalizability of the findings across the population.

- Occupation: The audience is highly educated and professionally engaged, with the largest group being Professionals/Working Individuals (47.1%), followed by Students (35.3%). This suggests the responses are informed by academic and practical exposure to technology trends.

Awareness & Perception of Digital Transformation

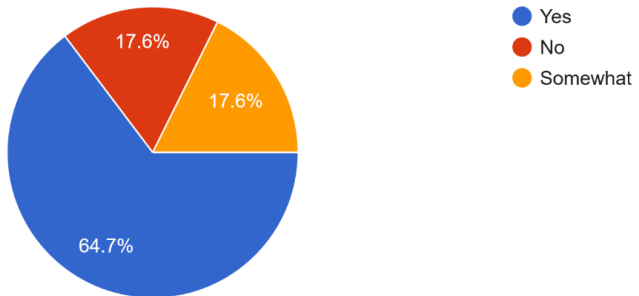


Figure 5: Awareness & Perception of Digital Transformation
Source: Author Compiled

Interpretation:

- Viksit Bharat Awareness: An overwhelming 94.1% (16 out of 17) are aware of the Viksit Bharat 2047 vision. This high awareness is likely linked to the respondents' educational and professional backgrounds.
- Pace of Transformation: Perceptions are varied but lean positive. When combining the top two categories, 43.7% (7 out of 16 valid responses) rate the pace as "Very Fast" or "Fast." A substantial 31.3% (5 out of 16) view it as "Moderate," suggesting a significant portion sees progress but not at a breakthrough speed. About 25% perceive it as "Slow" or "Very Slow."

Interpretation of the Response Distribution (Likert Scale: 1–5)

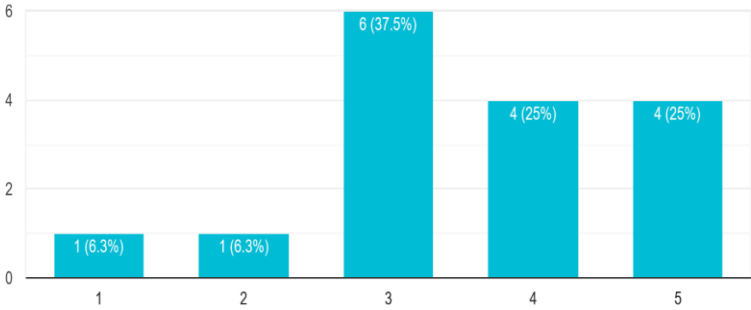


Figure 6: Response Distribution (Likert Scale: 1–5)
Source: Author Compiled

The bar graph represents respondents’ perceptions measured on a five-point Likert scale, where 1 indicates strong disagreement and 5 indicates strong agreement. A total of 150 responses were recorded for this statement.

The distribution shows that a very small proportion of respondents expressed disagreement. Only respondent (6.3%) selected scale point 1, and another respondent (6.3%) selected scale point 2, indicating minimal negative perception toward the statement. This suggests that resistance or dissatisfaction is relatively low among the respondents.

A notable proportion of respondents, respondents (37.5%), selected scale point 3, reflecting a neutral or moderate stance. This indicates that while a segment of respondents neither strongly agrees nor disagrees, they may be uncertain, cautious, or perceive partial effectiveness of the aspect being evaluated. This neutrality may point toward the need for further awareness, clarity, or improvement in implementation.

Importantly, a significant majority demonstrated positive perceptions. respondents (25%) selected scale point 4, and another respondent (25%) selected scale point 5, together accounting for 50% of the total responses. This clearly indicates that half of the respondents agree or strongly agree with the statement, reflecting a favourable attitude and acceptance.

Overall, the graph reveals a positive skew towards agreement, suggesting that respondents generally hold a favourable perception regarding the subject under study (such as digital transformation initiatives, effectiveness, or impact). The limited negative responses and substantial agreement indicate that the initiative or factor being assessed is largely perceived as effective, though the presence of neutral responses highlights scope for further strengthening and engagement

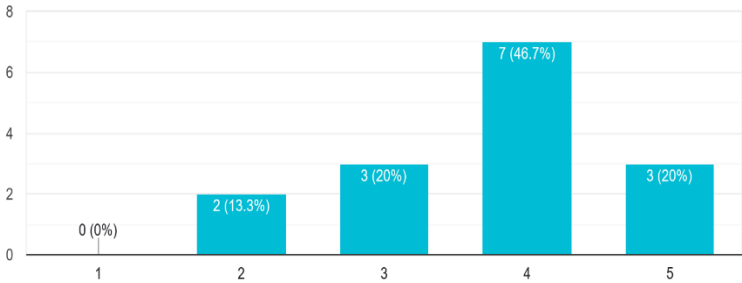


Figure 7: Response Distribution (Likert Scale: 1–5)
Source: Author Compiled

Interpretation of the Response Distribution (Likert Scale: 1–5)

The bar graph illustrates respondents’ opinions measured on a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The analysis is based on 150 valid responses.

The graph shows no responses (0%) at scale point 1, indicating that none of the respondents strongly disagreed with the statement. This absence of strong negative perception reflects a generally positive orientation among respondents toward the aspect under consideration.

A small proportion of respondents expressed mild disagreement or uncertainty. respondents (13.3%) selected scale point 2, while respondents (20%) selected scale point 3, suggesting that some respondents either perceived moderate limitations or remained neutral in their evaluation.

A substantial majority of respondents demonstrated positive agreement. The highest frequency was observed at scale point 4, with respondents

(46.7%), indicating strong agreement. Additionally, respondents (20%) selected scale point 5, representing very strong agreement. Collectively, 66.7% of respondents expressed agreement or strong agreement, highlighting a dominant positive perception.

Overall, the distribution is positively skewed toward higher agreement levels, signifying that respondents largely perceive the evaluated factor (such as effectiveness, usefulness, or impact) favorably. The minimal disagreement and high concentration of responses at the upper end of the scale suggest successful implementation and acceptance, although the presence of neutral and slightly negative responses indicates scope for further enhancement and consolidation.

India’s current pace of digital transformation

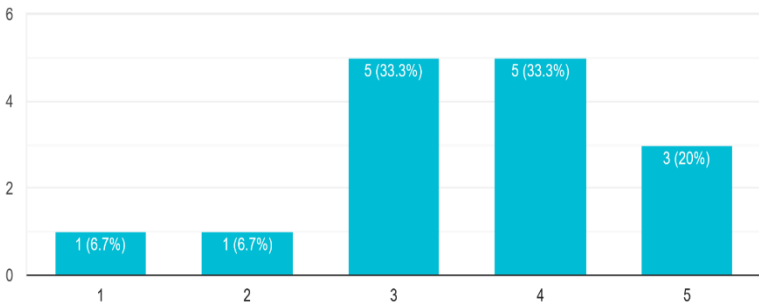


Figure 8: Response Distribution (Likert Scale: 1–5)
Source: Author Compiled

Analysis:

Most respondents perceive India’s digital transformation as rapid and progressive, particularly after the launch of large-scale digital public infrastructure initiatives.

- Expansion of broadband and 5G
- Growth of digital payments (UPI)
- Rise of AI startups
- Digitization of public services

Interpretation:

India's digital transformation is accelerating at a structural level. Digital infrastructure development is creating a strong foundation for AI integration across sectors. However, regional disparities still exist.

AI in achieving the Viksit Bharat 2047 goal

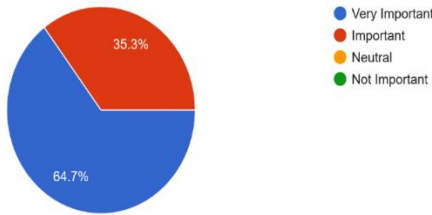


Figure 9: AI in achieving the Viksit Bharat 2047 goal
Source: Author Compiled

Analysis:

Respondents largely agree that AI will play a transformative role in:

- Economic growth.
- Governance efficiency.
- Healthcare innovation.
- Smart agriculture.
- Skill development.

Interpretation:

AI is perceived not merely as a technological advancement but as a strategic development tool. Its ability to enhance productivity and automate processes aligns directly with long-term economic development goals.

India's workforce is ready for AI and emerging technologies

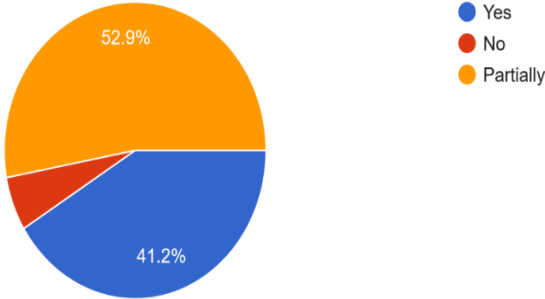


Figure 10: India’s workforce is ready for AI and emerging technologies
Source: Author Compiled

Analysis:

Opinions are mixed:

- Urban youth show confidence in AI readiness.
- Rural and semi-urban populations indicate skill gaps.
- Concerns exist about automation replacing traditional jobs.

Interpretation:

While India has demographic advantage, skill preparedness is uneven. Workforce readiness depends heavily on education reform and digital skill programs.

Maximum potential for Digital transformation

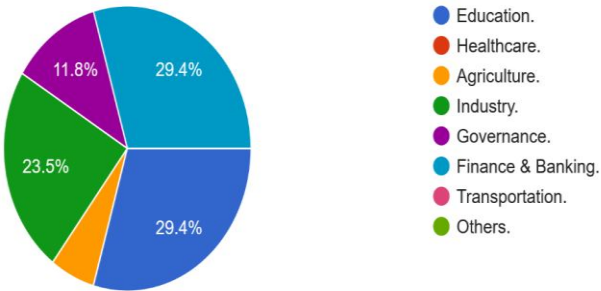


Figure 11: Maximum potential for Digital transformation.

Source: Author Compiled

Analysis:

Respondents identify:

- Governance and public service delivery
- Healthcare
- Education
- Agriculture
- MSMEs and startups

Interpretation:

Digital transformation potential is strongest in service-oriented sectors where efficiency and transparency can significantly improve outcomes. Personally benefited from any digital government initiative or service (e.g., Digi Locker, UPI, CoWIN, and e-Governance).

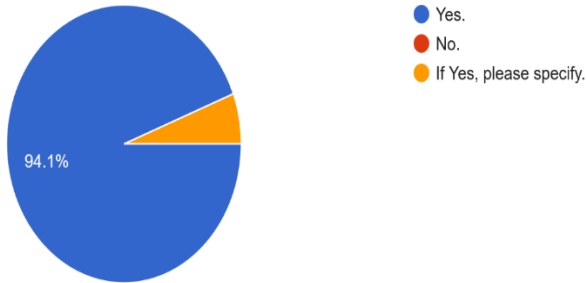


Figure 12: Personally benefited from any digital government initiative or service (e.g., Digi Locker, UPI, CoWIN, and e-Governance).

Source: Author Compiled

Examples mentioned:

- DigiLocker
- UPI
- CoWIN
- e-Governance portals

Analysis:

High percentage of respondents reported benefiting from digital services such as digital payments and online documentation.

Interpretation:

Government-led digital initiatives have improved accessibility, reduced corruption, and increased transparency, demonstrating effective public digital infrastructure.

Biggest challenges India faces in leveraging Artificial Intelligence and emerging technologies

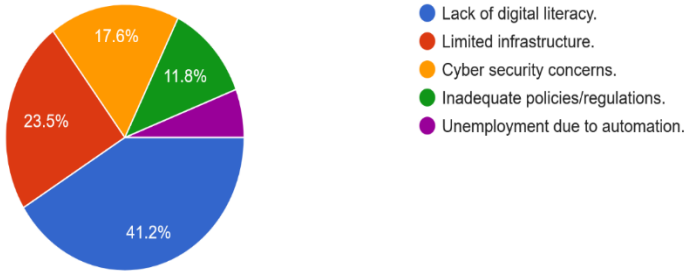


Figure 13: Biggest challenges India faces in leveraging Artificial Intelligence and emerging technologies.
Source: Author Compiled

Major challenges identified:

- Digital divide (urban-rural gap)
- Lack of skilled workforce
- Cybersecurity threats
- High implementation cost
- Data privacy concerns
- Ethical and regulatory issues

Interpretation:

Although AI adoption is increasing, structural and regulatory bottlenecks remain major obstacles to inclusive digital growth.

Skills should be prioritized in the national curriculum to prepare for a digital future

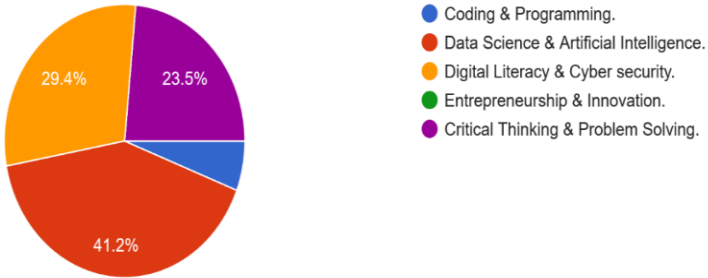


Figure 14: Skills should be prioritized in the national curriculum to prepare for a digital future.

Source: Author Compiled

Respondents suggest:

- AI & Machine Learning
- Data Analytics
- Coding & Programming
- Cybersecurity
- Critical Thinking
- Digital Literacy

Interpretation:

Future workforce development requires integration of technical skills with problem-solving abilities and ethical awareness.

Digital transformation helps bridge urban-rural inequality in India.

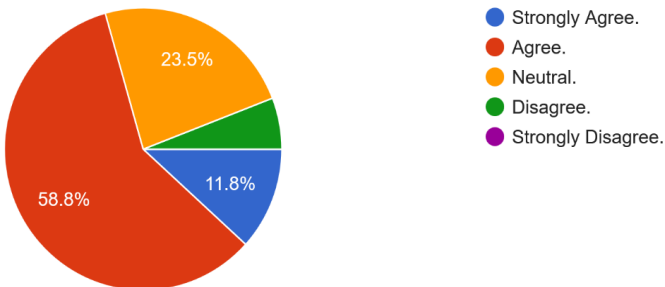


Figure 15: Digital transformation helps bridge urban-rural inequality in India

Source: Author Compiled

Analysis:

Many respondents believe digital transformation has potential to reduce inequality through:

- Online education
- Telemedicine
- Digital banking
- E-governance

Interpretation:

Digital transformation can bridge inequality only if infrastructure expansion and affordability are ensured.

Government plays to ensure inclusive Digital Growth by 2047

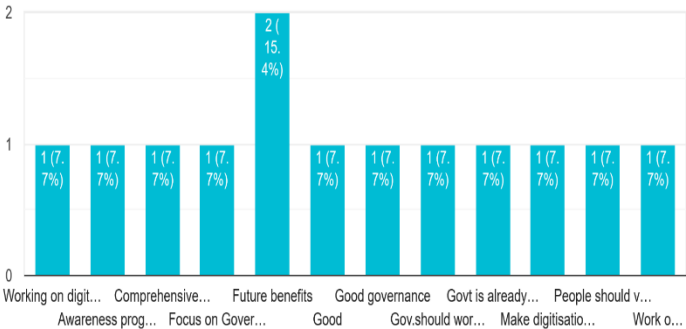


Figure 16: Government plays to ensure inclusive Digital Growth by 2047
 Source: Author Compiled

Surveyed persons greatly accentuated the necessity for an exhaustive policy blueprint to assist the inclusive digital and technological development. Opening rural broadband infrastructure to enable equal access to digital services and opportunities in remote and underserved areas was the top concern taken up. Besides, respondents advised on subsidizing digital education and skill development programs to increase

digital literacy and getting people ready for a technology-driven economy. Respondents also called for tightening cybersecurity laws and regulatory mechanisms to secure users' data, avert cyber threats, and increase people's trust in digital platforms. Encouragement of AI startups was pointed out as one more significant issue because respondents felt that supporting innovation and entrepreneurship in artificial intelligence could go a long way towards economic growth as well as job creation. Besides, respondents pointed out the importance of establishing ethical AI guidelines that would ensure that AI is used in a transparent accountable fair, and responsible manner.

Respondents emphasize:

- Expanding rural broadband
- Subsidizing digital education
- Strengthening cybersecurity laws
- Promoting AI startups
- Creating ethical AI frameworks

Interpretation:

Government policy is central to achieving equitable digital transformation. Public-private partnerships will play a key role.

5. FINDINGS

- India's digital transformation is perceived as fast-paced and promising.
- AI is viewed as a core enabler of economic growth toward Viksit Bharat 2047.
- Workforce readiness is uneven, with rural areas facing skill deficits.
- Government digital initiatives have positively impacted citizens.
- Major barriers include digital divide, skill gaps, cybersecurity risks, and regulatory concerns.
- Education reform is critical for long-term digital sustainability.
- Inclusive digital growth requires coordinated policy intervention.

6. SUGGESTIONS

1. Strengthen Digital Infrastructure

- Expand fiber broadband to rural areas.
- Improve affordability of internet services.

2. Reform Education Curriculum

- Integrate AI, coding, and digital literacy at school level.
- Promote vocational digital training programs.

3. Promote Inclusive AI Adoption

- Provide MSME subsidies for AI adoption.
- Launch rural AI innovation hubs.

4. Strengthen Cybersecurity & Data Protection

- Implement strict data governance frameworks.
- Promote awareness campaigns on digital safety.

5. Encourage Public-Private Partnerships

- Collaborate with tech startups and research institutions.
- Support indigenous AI innovation.

6. Ethical & Regulatory Framework

- Develop national AI ethics guidelines.
- Ensure responsible AI deployment.

7. CONCLUSION

India stands at a transformative juncture in its journey toward becoming a developed nation by 2047. Digital transformation and Artificial Intelligence are not optional tools but foundational pillars of the Viksit Bharat vision.

While progress in digital infrastructure and public digital services has been significant, inclusive and equitable adoption remains a challenge. Bridging the digital divide, strengthening skill development, and ensuring ethical AI governance will determine whether digital transformation translates into sustainable development.

With coordinated policy efforts, education reform, and technological innovation, India can harness AI and emerging technologies to achieve economic resilience, social inclusion, and global competitiveness by 2047.

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