



Indian Economy and the Role of Artificial Intelligence: Catalysing Productivity, Innovation, and Viksit Bharat

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Abstract- India, currently one of the fastest-growing major economies in the world, stands at a critical juncture where technological advancement is reshaping its economic trajectory. With a nominal GDP approaching \$5 trillion in 2026 and a growth rate of approximately 7.2%, the country is positioning itself as a global leader in digital transformation. Artificial Intelligence (AI) has emerged as a key enabler in this transformation, driving productivity, fostering innovation, and supporting the vision of “Viksit Bharat” (Developed India) by 2047. The Indian AI market, valued at around ₹99,400 crore in 2025, is projected to expand to ₹2.7 lakh crore by 2031, reflecting rapid adoption across sectors. AI is expected to contribute between \$500 billion and \$957 billion to India’s GDP by 2035, with optimistic projections reaching up to \$1.7 trillion. With approximately 89% of Indian organizations adopting AI—significantly higher than the global average of 69%—India demonstrates strong readiness for AI-driven growth. The country also possesses a robust talent pool of nearly 6 million AI professionals, supported by initiatives such as the IndiaAI Mission, which allocates ₹10,372 crore for infrastructure, datasets, and skilling. Sectoral impacts of AI are widespread, including enhanced productivity in banking (up to 40%), manufacturing (30%), agriculture (20%), and healthcare (high diagnostic accuracy). However, challenges such as job displacement, data security concerns, infrastructure limitations, and ethical issues must be addressed. This research article examines the macroeconomic contributions of AI, its sectoral applications, employment implications, policy frameworks, and future projections, with a particular focus on Karnataka’s role as a leading AI hub.

Key words:Artificial Intelligence, Indian Economy, Digital Transformation, Productivity Growth, Innovation, Viksit Bharat, Employment, AI Policy, Economic Development, Automation

I. INTRODUCTION

India’s economic growth story has been marked by resilience, innovation, and structural transformation. As the third-largest economy in the world by purchasing power parity and approaching a \$5 trillion nominal GDP milestone, India has become a major player in the global economic landscape. The country recorded a growth rate of over 8% in FY 2024–25, driven by strong domestic consumption, digital expansion, and policy reforms. Notably, the digital economy contributes nearly 40% to India’s overall economic output, reflecting the increasing role of technology in economic development.

Artificial Intelligence has emerged as a transformative force within this digital ecosystem. AI technologies—including machine learning, natural language processing, robotics, and data analytics—are enabling businesses and governments to optimize processes, enhance decision-making, and create new value propositions. The rapid adoption of AI across industries is indicative of its potential to reshape India’s economic structure.

India’s commitment to AI development is evident through initiatives such as the IndiaAI Mission, which aims to build a comprehensive AI ecosystem encompassing infrastructure, research, and human capital. The allocation of ₹10,372 crore for this mission underscores the government’s strategic focus on AI as a driver of economic growth.

The concept of “Viksit Bharat” envisions India as a developed nation by 2047, emphasizing inclusive growth, technological advancement, and sustainable development. AI plays a crucial role in achieving this vision by enhancing productivity, fostering innovation, and addressing socio-economic challenges.

II. AI’S MACROECONOMIC CONTRIBUTIONS

Artificial Intelligence is significantly contributing to India’s macroeconomic growth by enhancing productivity, increasing efficiency, and driving innovation across sectors. One of the most notable impacts of AI is its potential to boost GDP. According to various estimates, AI could add



between \$500 billion and \$957 billion to India's GDP by 2035. This contribution is expected to come from increased efficiency in production processes, improved decision-making, and the creation of new markets and industries.

AI-driven productivity gains are particularly evident in sectors such as banking, manufacturing, and information technology. By automating routine tasks and enabling data-driven insights, AI allows organizations to operate more efficiently and reduce costs. This leads to higher output and improved competitiveness in both domestic and global markets.

Investment in AI is also playing a crucial role in economic growth. The Indian AI market is expanding rapidly, with significant investments from both domestic and international players. Major technology companies are investing billions of dollars in AI infrastructure, research, and development, further strengthening India's position as a global technology hub.

The growth of AI startups is another important factor contributing to economic development. India has one of the largest startup ecosystems in the world, with a significant proportion of startups focusing on AI and deep-tech solutions. These startups are driving innovation, creating employment opportunities, and attracting foreign investment.

Furthermore, AI is enabling the development of new business models and revenue streams. For example, AI-powered platforms are transforming industries such as e-commerce, fintech, and healthcare by offering personalized services and improving customer experiences.

Sectoral Role of Artificial Intelligence

Artificial Intelligence is transforming multiple sectors of the Indian economy by enhancing productivity, improving efficiency, and enabling innovation. In the banking, financial services, and insurance (BFSI) sector, AI is widely used for fraud detection, risk assessment, and customer service. AI-powered systems can analyze large volumes of data in real time, enabling financial institutions to detect fraudulent activities with high accuracy and improve credit assessment processes.

In the manufacturing sector, AI is driving the adoption of smart manufacturing practices. Automation, predictive maintenance, and quality control systems powered by AI are improving productivity and reducing operational costs. These advancements are particularly beneficial for micro, small, and medium enterprises (MSMEs), which play a crucial role in India's economy.

Agriculture is another sector where AI is making a significant impact. Precision farming techniques, supported by AI, enable farmers to optimize the use of resources such as water, fertilizers, and pesticides. AI-based advisory systems provide farmers with real-time information on weather conditions, crop health, and market trends, helping them make informed decisions.

In the healthcare sector, AI is revolutionizing diagnostics, treatment planning, and patient care. AI-powered tools can analyze medical data with high accuracy, enabling early detection of diseases and personalized treatment plans. This not only improves patient outcomes but also reduces healthcare costs.

III. EMPLOYMENT AND SKILLING DYNAMICS

The adoption of AI is reshaping the employment landscape in India. While AI has the potential to create new job opportunities, it also poses challenges in terms of job displacement. It is estimated that AI could create around 4 million new jobs by 2031 in areas such as data science, machine learning, and AI engineering. At the same time, a significant proportion of routine and repetitive jobs may be automated, leading to job displacement.

The key to addressing this challenge lies in reskilling and upskilling the workforce. India has a large talent pool, with approximately 6 million professionals already working in AI-related fields. However, there is a need to expand this pool further to meet the growing demand for skilled workers.

Government initiatives such as the India AI Talent Mission aim to provide training and education in AI and related technologies. These programs focus on developing skills in areas such as data analysis, programming, and machine learning, ensuring that the workforce is prepared for the future.

The concept of reverse brain drain is also gaining importance. By creating opportunities and providing incentives, India can attract skilled professionals from abroad, further strengthening its talent pool.

IV. Policy Framework and Government Initiatives

The Indian government has implemented several policies and initiatives to promote the adoption of AI and support its integration into the economy. The IndiaAI Mission is a key initiative that aims to build a comprehensive AI ecosystem, including infrastructure, research, and human capital development.



The government is also focusing on creating a supportive regulatory environment for AI. This includes developing guidelines for data protection, privacy, and ethical use of AI. These measures are essential for building trust and ensuring the responsible use of technology.

In addition to national initiatives, state governments are also playing a crucial role in promoting AI. Karnataka, for example, has emerged as a leading AI hub, with a strong ecosystem of startups, research institutions, and technology companies.

V. CASE STUDIES

Several case studies provide strong empirical evidence of how Artificial Intelligence is transforming India's economy across sectors. One of the most notable examples is the adoption of AI in the banking, financial services, and insurance (BFSI) sector. AI-powered fraud detection systems used by banks and digital payment platforms have significantly reduced fraudulent transactions by identifying suspicious patterns in real time. This has not only enhanced financial security but also increased customer trust in digital financial systems. Additionally, AI-driven chatbots and virtual assistants have improved customer service by providing instant responses, thereby reducing operational costs and improving efficiency.

Another important case is the integration of AI in digital payment systems such as Unified Payments Interface, where machine learning algorithms monitor transactions and prevent fraud at scale. This has contributed to the rapid expansion of cashless transactions in India.

In the manufacturing sector, AI-enabled predictive maintenance systems have reduced downtime and increased productivity. Companies are using AI to optimize supply chains, improve quality control, and reduce waste. Similarly, in agriculture, AI-based advisory platforms provide farmers with real-time information on weather, soil conditions, and crop health, leading to higher yields and improved income.

These case studies highlight that AI is not just a theoretical concept but a practical tool driving real economic benefits. They demonstrate how technology, when effectively implemented, can improve productivity, enhance service delivery, and contribute to overall economic growth.

VI. CHALLENGES AND RISKS

Despite its transformative potential, the adoption of Artificial Intelligence in India presents several

challenges and risks that must be carefully addressed. One of the most critical concerns is data security and privacy. AI systems rely heavily on large volumes of data, including sensitive personal and financial information. Any breach or misuse of this data can lead to serious consequences, including loss of trust and legal implications. Therefore, robust data protection frameworks and cybersecurity measures are essential.

Infrastructure limitations also pose a significant challenge. AI requires advanced computing power, high-performance processors, and large-scale data storage systems. In many parts of India, especially in rural and semi-urban areas, such infrastructure is either inadequate or absent. Bridging this digital divide is crucial for ensuring inclusive growth.

Another major issue is the risk of job displacement. Automation driven by AI can replace routine and repetitive jobs, particularly in sectors such as manufacturing and customer service. While new jobs are being created, there is a gap between the skills required and the skills available in the workforce.

Ethical concerns, including algorithmic bias and lack of transparency, further complicate AI adoption. Biased datasets can lead to unfair outcomes, particularly in areas such as hiring, lending, and law enforcement. Ensuring fairness, accountability, and transparency in AI systems is essential for responsible use.

VII. FUTURE PROJECTIONS

The future of Artificial Intelligence in India is highly promising, with substantial growth expected in both economic and technological dimensions. AI is projected to contribute significantly to India's GDP, with estimates suggesting an addition of hundreds of billions of dollars by 2035. This growth will be driven by increased adoption across key sectors such as healthcare, agriculture, manufacturing, and financial services.

India's strong digital infrastructure, combined with its large pool of skilled professionals, positions the country as a global leader in AI innovation. The expansion of initiatives such as the IndiaAI Mission is expected to further strengthen the ecosystem by providing access to computing resources, datasets, and research opportunities.

Emerging technologies such as generative AI, quantum computing, and advanced robotics will play a crucial role in shaping the future. These technologies will enable new applications and business models, creating opportunities for startups and established enterprises alike.

Additionally, regional hubs such as Bengaluru and other emerging cities are expected to drive



innovation and attract investment. The focus on developing tier-2 and tier-3 cities will ensure balanced regional growth.

Overall, the future trajectory of AI in India indicates a shift towards a knowledge-based economy, where innovation and technology will be the primary drivers of growth.

VIII. RECOMMENDATIONS

To fully harness the potential of Artificial Intelligence, India must adopt a comprehensive and strategic approach. One of the most important recommendations is to expand skilling and education programs. Developing a workforce that is proficient in AI and related technologies is essential for meeting future demand. Government initiatives should focus on integrating AI education into school and university curricula, as well as providing training programs for working professionals.

Investment in infrastructure is another critical area. The development of high-performance computing facilities, data centers, and digital connectivity will enable widespread adoption of AI technologies. Public-private partnerships can play a key role in mobilizing resources and accelerating infrastructure development.

Promoting research and development is equally important. Increased funding for AI research institutions and innovation hubs will drive technological advancements and support the creation of indigenous solutions tailored to India's needs.

Collaboration between government, industry, and academia must be strengthened to create a cohesive ecosystem. Policies should encourage innovation while ensuring ethical and responsible use of AI. Establishing clear guidelines for data protection, transparency, and accountability will help build trust among stakeholders.

Finally, efforts should be made to ensure inclusive growth by extending AI benefits to rural and underserved regions. This will help reduce inequality and ensure that the advantages of technological progress are shared widely.

IX. CONCLUSION

Artificial Intelligence is rapidly emerging as a cornerstone of India's economic transformation, playing a crucial role in enhancing productivity, fostering innovation, and driving sustainable development. As India moves towards its goal of becoming a developed nation under the vision of Viksit Bharat, AI will act as a key enabler in achieving this objective. The technology's ability to optimize processes, improve decision-making, and

create new economic opportunities makes it an indispensable tool for future growth.

However, the successful integration of AI into the economy requires a balanced and responsible approach. Challenges related to employment, data security, infrastructure, and ethics must be addressed proactively. Ensuring that AI systems are transparent, fair, and inclusive is essential for building trust and maximizing their benefits.

India's strong policy framework, growing talent pool, and dynamic startup ecosystem provide a solid foundation for AI-driven growth. With continued investment in education, infrastructure, and research, the country is well-positioned to become a global leader in AI.

In conclusion, Artificial Intelligence is not just a technological advancement but a transformative force that has the potential to reshape India's economic landscape. By leveraging this technology effectively and responsibly, India can achieve inclusive and sustainable development, paving the way for a prosperous future.

The economic argument is strengthened by computational modelling, location-based clustering, fuzzy decision reasoning and welfare-oriented analytical perspectives [6]-[9]. These sources support the use of evidence-based and data-oriented economic interpretation. Recent policy and institutional sources further support the discussion on economic change, digital transformation and inclusive development [10]-[12].

The study highlights that economic transformation must be assessed through inclusive growth, access, welfare impact and institutional effectiveness. Data-based and computational approaches can strengthen economic interpretation, but policy conclusions should remain sensitive to local realities and beneficiary-level differences.

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