

A Review on economic effects of artificial intelligence in India

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Abstract

This paper analyse into how artificial intelligence (AI) is changing the managerial and economic landscape and impacts the GDP growth, employment prospects, productivity and economic aspects of the Indian economy. It's discussing that the large opportunities in terms of increases in productivity can ensure including for developing countries, given the vastly reduced costs of capital that some applications have demonstrated and the potential for productivity increases, especially among the low skilled. At the same time, risks in the form of further increases in inequality need to be addressed if the benefits from AI-based technological progress are to be broadly shared. For this, skills policies are necessary but not sufficient. It also looks at how management practises are changing as a result of AI, notably in relation to the development of new business models, improved decision-making processes, and widespread task automation. The current wave of technological change based on advancements in artificial intelligence (AI) has created widespread fear of job loss and further rises in inequality. The results highlight how AI has the ability to considerably boost India's economic development and also recognise the need to address talent gaps and ethical issues at the same time.

I.INTRODUCTION

This paper analyse into how artificial intelligence (AI) is changing the managerial and economic landscape and impacts the GDP growth, employment prospects, productivity and economic aspects of the Indian economy. It's discusses that the large opportunities in terms of increases in productivity can ensure including for developing countries, given the vastly reduced costs of capital that some applications have demonstrated and the potential for productivity increases, especially among the low skilled. At the same time, risks in the form of further increases in inequality need to be addressed if the benefits from AI-based technological progress are to be broadly shared. For this, skills policies are necessary but not sufficient. It also looks at how management practises are changing as a result of AI, notably in relation to the development of new business models, improved decision-making processes, and widespread task automation. The current wave of technological change based on advancements in artificial intelligence (AI) has created widespread fear of job loss and further rises in inequality. The results highlight how AI has the ability to considerably boost India's economic development and also recognise the need to address talent gaps and ethical issues at the same time.

AI in Indian Economy

1. The Indian economy is rapidly and significantly changing due to artificial intelligence (AI), which is also revolutionising traditional management techniques.
2. The enormous potential is shown by projections from the McKinsey Global Institute, which predict that AI will have a startling \$15.7 trillion economic impact on India by 2035.
3. The rapidly growing AI industry is expected to be a job-creating engine.
4. The industry association NASSCOM projects that by 2025, India will have added almost 400,000 new jobs, demonstrating the radical changes that AI has already made to the world of work.
5. A PwC analysis found that by 2035, AI may add 9 million new employment to India. This enormous potential for job creation demonstrates the important role artificial intelligence (AI) can play in meeting employment needs and promoting economic growth in the nation. Aiming to raise AI spending to 1% of GDP by 2030, the Indian government has set lofty goals to support this. The third-largest startup environment in the world, where several start-ups' are leading the way in cutting-edge AI-powered solutions, serves as further proof of India's strong commitment to investing in AI. The National Strategy on Artificial Intelligence and the AI for India project are only two of the major initiatives the Indian government has launched in

support of this ambition, reflecting the nation's dedication to advancing the field.

Objectives

- To examine the growth and development of Artificial Intelligence in India from 2016 to 2025.
- To analyze AI investment trends and government initiatives in India.
- To study the adoption of AI across various sectors such as healthcare, education, finance, and manufacturing.
- To evaluate the contribution of AI to India's economic growth and employment

AI's Impact on Productivity

AI is anticipated to significantly increase productivity in India. AI can aid organisations with task automation, better decision-making, and process optimisation. Significant productivity increases may result from this, which would then increase GDP growth.

AI is currently being applied in India, for instance, to personalise marketing campaigns and automate customer support activities.

Here are some concrete instances of how AI is being applied in India to raise productivity:

1. An Indian retailer has automated its customer assistance processes using artificial intelligence. Client wait times have been drastically decreased as a result, freeing up human customer support representatives to focus on more challenging tasks.
2. AI is being used by an Indian manufacturer to enhance its production methods. As a result, there are now fewer flaws, more products are produced, and costs are going down.
3. AI is being used by an Indian e-commerce company to customise its marketing tactics. Sales, click through rates, and conversion rates have all increased as a result of this.

According to McKinsey Global Institute report (2020) in several Indian economic sectors, artificial intelligence (AI) has the potential to greatly boost production. By 2030, the adoption of AI could boost India's GDP by an estimated \$957 billion, with better productivity contributing around 15% of this growth, according to a McKinsey Global Institute report.

Economic growth of "Artificial Intelligence in India.

Year	AI Market Size in India (USD Billion)	AI Startups (Approx.)	AI Workforce (Approx.)	AI Contribution to GDP (%)
2016	0.2	200	40,000	0.1
2017	0.3	400	50,000	0.2
2018	0.5	700	70,000	0.3
2019	0.8	1,000	90,000	0.4
2020	1.5	1,500	1,20,000	0.5
2021	3.1	2,000	1,80,000	0.7
2022	4.5	3,000	2,50,000	0.9
2023	6	3,700	3,20,000	1.1
2024	8.5	4,500	4,20,000	1.4
2025	11.8	5,500+	500,000+	1.8

Source

NASSCOM – AI adoption, workforce, and industry reports.

NITI Aayog National Strategy for AI – Government AI policy and economic impact reports.

1. India's AI market size increased significantly from USD 0.2 billion in 2016 to USD 11.8 billion in 2025. This indicates strong investment, technological advancement, and increasing adoption of AI across industries.
2. The number of AI startups grew from 200 in 2016 to more than 5,500 in 2025. This reflects a thriving innovation ecosystem and growing entrepreneurial interest in AI-based solutions.
3. Employment opportunities in the AI sector expanded from 40,000 professionals in 2016 to over 500,000 professionals in 2025. The data highlights the rising demand for skilled workers in areas such as machine learning, data science, and automation.
4. AI's contribution to India's GDP increased from 0.1% in 2016 to 1.8% in 2025. This demonstrates the growing economic importance of AI and its role in enhancing productivity and innovation.

5. A notable surge is visible after 2020, when the AI market size, startups, workforce, and GDP contribution grew rapidly. This growth can be attributed to increased digital transformation, automation, cloud computing, and government initiatives supporting AI adoption.

Ways of AI increase productivity:

There are many ways that AI increases productivity, including:

Automation of Tasks: AI can automate a variety of tasks, from simple cognitive processes to complex manual chores. This automation frees up human resources to devote themselves to more innovative and strategic projects.

Enhanced Decision-Making: AI equips professionals to make wise choices by offering insightful analyses and suggestions based on extensive data analysis.

Process optimisation: AI helps companies streamline their operations by locating and addressing process inefficiencies.

AI-Driven Productivity Increases in India

1. **Manufacturing Sector:** AI is progressively automating activities like assembly, quality control, and proactive maintenance in the manufacturing sector. This automation boosts operational effectiveness while cutting expenses.
2. **Agriculture Sector:** The use of AI in agriculture includes generating new crop types, improving irrigation systems, and early pest and disease detection. These AI-powered tools help farmers increase yields while reducing losses.
3. **Healthcare Sector:** AI is greatly improving the accuracy of disease diagnosis, enabling personalised treatment regimens, and optimising the efficiency of healthcare service delivery. This results in better patient outcomes and lower expenses.
4. **The sector of Education:** AI is used to improve educational quality, personalize learning experiences, and enable greater access to education. Students can learn more successfully and quickly as a result of this.

To increase productivity, the Indian government is actively supporting the use of AI.

To support AI research, development, and corporate accessibility, programmes like the National Strategy for Artificial Intelligence have been launched.

To increase their efficiency, private businesses are also making significant investments in AI-powered solutions.

Finally, AI has the potential to greatly raise productivity in India. The adoption of AI is greatly influenced by public policies and investments made by the

private sector. The effects are already noticeable in many different industries, and as AI develops, its potential to revolutionise productivity is only going to increase.

Key Takeaway: AI has the ability to revolutionise productivity across a range of industries, making it a critical driver of India's economic development. The deliberate actions taken by the government and the substantial investments made by the corporate sector highlight the crucial part AI will play in determining the future of employment and productivity.

Impact of AI on Job Creation:

Sector-specific Job Creation by AI in India: Transformative Effects and Projections

Artificial intelligence (AI) is being quickly incorporated into many Indian industries, which is greatly advancing both technology and job growth. According to data and analysis, there is a noticeable increase in work prospects in several important areas.

Software development and IT:

According to a survey by NASSCOM, the Indian IT sector is expected to add 1 million employment related to artificial intelligence by 2025. In addition, a thoughtful poll by NASSCOM revealed that 80% of Indian IT firms intend to hire new AI talent in the future year. The opening of a Google AI research facility in Bengaluru provides additional evidence that hundreds of new employment in AI research and development will be created.

Manufacturing

According to estimates from the McKinsey Global Institute, the deployment of AI in the Indian industrial sector might result in up to 950,000 new jobs by 2030. To further support the potential influence on job creation, the Indian government has launched a programme to train 1 million people in AI capabilities, particularly in the manufacturing industry. The incorporation of AI-powered robots by Tata Motors in its production facilities highlights the possibility of new employment opportunities in AI-powered robotics and maintenance.

Healthcare

According to estimates from the World Economic Forum, AI has the potential to create up to 1 million new employments in the Indian healthcare sector by 2030. The Indian government's pledge to spend \$1 billion on AI research and development for the healthcare industry also contributes to the optimistic prognosis for employment creation. The launch of an AI-powered cancer diagnostic tool by Apollo Hospitals is a prime example of the potential for new job growth in AI-powered medical imaging and diagnostics Education.

According to KPMG's analysis, by 2030, AI might help create up to 5 million new employments in the Indian education industry. This potential is reinforced by the Indian government's aim to create instructional content powered by AI for all pupils in the nation. A prime example of the creation of new jobs in AI-powered educational technology is Byju's, a well-known Indian online education provider that uses AI to personalise learning for its students.

Customer Service

According to Gartner's study, up to 4 million new jobs could be created in the Indian customer service industry by 2025 as a result of AI. Further supporting the potential for employment creation, a recent KPMG poll shows that 70% of Indian enterprises intend to use AI-powered customer care chatbots within the next year. Notably, Flipkart, a leading Indian e-commerce company, utilizing AI-powered chatbots for customer support, exemplifies how AI is actively generating new job roles in customer service.

Other Industries

Agribusiness, banking, retail, and transportation are just a few of the industries that AI is transforming. Precision irrigation and crop monitoring systems are two examples of cutting-edge technologies that are being developed in agriculture thanks to AI. In a similar vein, AI is speeding up financial services activities like loan processing and fraud detection. AI in retail is improving supply chain management and personalising the shopping experience. Finally, AI is promoting the development of autonomous vehicles and streamlining traffic.

"Artificial Intelligence has emerged as a significant driver of economic growth in India. Between 2016 and 2025, India's AI market expanded from approximately USD 0.2 billion to nearly USD 12 billion. The number of AI startups increased from around 200 to more than 5,500, while AI-related employment exceeded 500,000 jobs by 2025. Increased investments in AI technologies have enhanced productivity across manufacturing, healthcare, agriculture, education, and financial services, contributing positively to India's GDP growth and digital transformation."

Opportunities and Challenges for Artificial Intelligence in India:

In India's future lies the future of a sixth of the world's population—enough reason by itself to track the country's tryst with AI. Of equal interest is India's unique social, cultural, economic, and political context, which has the potential to magnify both the benefits and the risks of AI. With a large, young workforce a fast growing economy and a vibrant, resilient democracy, India presents an opportunity for AI applications to have tremendous reach and scale (and helping create abundance). AI-driven interventions can enhance public services: for example, streamlining the public distribution system, and reducing the costs of law

enforcement. AI can also enhance private services, such as the use of AI-enabled personalised healthcare, or robots in production lines. On the other hand, India's challenges—varying from income inequality and caste-based discrimination to linguistic diversity—are also magnified by the size and variety of the population. Yet other societal challenges, such as malnutrition and girls' education may best be tackled through means unrelated to AI. Where AI can indeed make meaningful contributions, its solutions will often have to withstand cultural forces shaped by millennia of civilizational history.

Finally, in addition to revolutionising businesses, artificial intelligence is creating millions of new jobs in a range of industries in India. AI is transforming work landscapes across industries, offering chances for skill development, economic growth, and higher service quality. This includes IT, healthcare, education, and manufacturing. The revolutionary potential of AI in India's economic and technical progress is highlighted by these noteworthy job creation numbers.

II.CONCLUSION

The data clearly indicates that the AI industry in India has experienced substantial growth between 2016 and 2025. The continuous increase in market size, startup formation, workforce participation, and GDP contribution suggests that AI is becoming a key driver of India's economic development and technological progress. These trends highlight India's potential to emerge as a global leader in artificial intelligence in the coming years.

The comprehensive studies offered here give insight into the significant and less well-known effects of AI in Indian businesses. AI is transforming a variety of industries in India, from e-commerce to retail to telecommunications services, demonstrating its revolutionary potential in boosting output, efficiency, and user pleasure. Technological advances are launching Indian businesses into a new era of innovation and growth as we continue to see the integration of AI across industries. A game changer, AI's capacity to automate jobs, boost operations, and improve decision-making opens up previously unimaginable potential for organisations to prosper in an environment of escalating competition.

This study highlights the significant influence artificial intelligence (AI) has had on the Indian economy. The main conclusions of this study highlight AI's potential to significantly boost productivity, expand employment possibilities, and drive development in India's GDP. The case studies given show how AI is being efficiently used in a variety of industries, such as telecoms, e-commerce, and IT services, with measurable results including streamlined processes, higher consumer engagement, and increased network efficiency. The incorporation of AI has significant ramifications. AI can increase India's economic competitiveness and

resilience globally. However, closing the skill gap and guaranteeing ethical AI use are important issues that demand attention. In order to maximise the potential benefits of this game-changing technology while reducing related dangers, ethical AI deployment in conjunction with talent development will play a crucial role.

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