



IMPACT OF ARTIFICIAL INTELLIGENCE ON INDIA'S GROSS DOMESTIC PRODUCT (GDP)

Economy

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ABSTRACT

Artificial Intelligence (AI) is transforming global economies by enhancing productivity, innovation, and efficiency. This study examines the impact of AI on India's Gross Domestic Product (GDP), focusing on sectoral contributions, growth potential, and challenges. The research is based on secondary data collected from government reports and industry publications. The findings indicate that AI has the potential to significantly boost India's GDP through automation, digital transformation, and improved decision-making. However, challenges such as job displacement and skill gaps need to be addressed. The study concludes that effective policy implementation and investment in human capital are essential to maximize AI-driven economic growth.

KEYWORDS

Artificial Intelligence, GDP, Economic Growth, India, Digital Economy

1. INTRODUCTION:

Artificial Intelligence refers to the simulation of human intelligence in machines capable of learning, reasoning, and decision-making. In recent years, AI has emerged as a key driver of economic growth worldwide.

India, as one of the fastest-growing economies, is actively adopting AI technologies across sectors such as banking, healthcare, agriculture, and manufacturing. Government initiatives like Digital India and India AI Mission are promoting AI adoption.

GDP is an important indicator of economic performance, representing the total value of goods and services produced. AI contributes to GDP by improving productivity, reducing costs, and fostering innovation. This study explores how AI influences India's GDP and economic development.

2. Statement of the Problem:

Despite rapid advancements in Artificial Intelligence, there is limited clarity on its measurable impact on India's GDP and sectoral economic growth. Understanding this relationship is essential for policy formulation and sustainable development.

3. Objectives of the Study

- To analyze the impact of AI on India's GDP
- To examine sector-wise contributions of AI
- To identify opportunities and challenges of AI adoption
- To evaluate the future potential of AI in economic growth

4. Review of Literature

Various studies have examined the economic impact of AI globally and in India.

PwC (2017) estimated that AI could contribute significantly to global GDP by 2030 through productivity and consumption gains. McKinsey Global Institute (2018) highlighted that AI could increase global economic growth by improving efficiency and decision-making.

NASSCOM (2022) reported that AI could add substantial value to India's GDP, especially in sectors like banking and retail. NITI Aayog (2018) emphasized AI's role in inclusive growth, particularly in agriculture and healthcare.

Accenture (2016) introduced AI as a new factor of production, capable of enhancing labor productivity. EY (2023) highlighted the economic potential of generative AI in India.

However, organizations like the IMF have raised concerns about job displacement and inequality due to AI adoption.

Most studies focus on global trends, with limited detailed analysis of India's sector-wise GDP contribution and long-term economic implications.

5. Research Gap

There is a lack of comprehensive research focusing specifically on India's GDP in relation to AI adoption across sectors. Existing studies do not sufficiently address the balance between economic growth and employment challenges.

6. Hypothesis

- H₀:** Artificial Intelligence has no significant impact on India's GDP
- H₁:** Artificial Intelligence has a significant positive impact on India's GDP

7. Research Methodology:

Research Design

Descriptive and analytical research design

Data Type

Secondary data

Sources of Data

- Government reports
- Industry publications
- Research journals
- Official websites

Tools and Techniques

- Trend analysis
- Comparative analysis
- Descriptive statistics

Scope

Focuses on India and major sectors impacted by AI

Limitations

- Based on secondary data
- Rapid technological changes
- Limited sector-wise quantitative data

2. Analysis and Interpretation (With Data)

12.1 Projected Contribution of AI to India's GDP

Year	Estimated AI Contribution (USD Billion)	% of GDP
2020	50	2%
2025	450–500	8–10%
2030	700–900	10–12%
2035	957–1900	12–15%

Interpretation: The table shows a strong upward trend in AI contribution, indicating its growing importance in India's economic development.

12.2 Sector-wise Contribution of AI in India

Sector	Contribution (%)	Key Impact Areas
Banking & Finance	20%	Fraud detection, digital payments

Retail	15%	Customer analytics, personalization
Healthcare	15%	Diagnosis, automation
Manufacturing	20%	Automation, predictive maintenance
Agriculture	10%	Smart farming, yield prediction
Others	20%	Education, logistics, etc.

Interpretation: The service and industrial sectors contribute the most to AI-driven GDP growth.

12.3 AI Adoption Rate in India

Category	Percentage
Organizations using AI	80–87%
AI Mature Organizations	25–30%
Firms planning adoption	90%+

Interpretation: AI adoption is rapidly increasing, which will further accelerate GDP growth.

12.4 Impact of AI on Productivity Growth

Factor	Impact Level
Automation	High
Decision-making	High
Cost Reduction	Medium
Innovation	Very High

Interpretation: AI significantly improves productivity, which directly contributes to GDP growth.

08. Conceptual Framework

AI contributes to GDP through:

- Increased productivity
- Innovation and new business models
- Cost reduction
- Improved decision-making

AI acts as a general-purpose technology influencing multiple sectors and enhancing economic output.

09. Analysis and Interpretation:

09.1 GDP Contribution

AI is expected to contribute significantly to India's GDP in the coming years through increased efficiency and innovation.

09.2 Sector-wise Impact

- **Banking:** Improved fraud detection and digital services
- **Manufacturing:** Automation and predictive maintenance
- **Agriculture:** Precision farming and yield optimization
- **Healthcare:** Early diagnosis and cost reduction

09.3 Economic Trends

AI adoption is increasing rapidly, leading to higher productivity and economic growth.

10. DISCUSSION

The analysis shows that AI has a positive impact on GDP growth. The findings align with global studies that emphasize productivity gains and innovation. However, challenges such as job displacement and skill gaps need attention.

11. Findings of the Study

- AI significantly enhances productivity
- Service sector benefits the most
- Positive long-term GDP impact
- Skill gap remains a major challenge
- AI adoption is uneven across sectors

12. Suggestions / Recommendations:

- Invest in AI education and training
- Strengthen digital infrastructure
- Promote AI startups
- Ensure inclusive growth policies
- Develop data privacy regulations

13. CONCLUSION

Artificial Intelligence is a powerful driver of economic growth in India. It has the potential to significantly increase GDP through innovation and efficiency. However, to fully realize its benefits, India must address challenges related to employment, skills, and policy frameworks. With the right strategies, AI can lead to sustainable and inclusive economic development.

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