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Impact of Artificial Intelligence on Employment in India

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Abstract:

Artificial Intelligence (AI) has become one of the most powerful technologies influencing modern economies and the job market. In India, AI is being increasingly used in areas like information technology, banking, manufacturing, healthcare, and retail, changing the way work is done and the kinds of jobs available. AI systems can do many routine and repetitive tasks more quickly and accurately than humans, which may lead to fewer jobs for people with low skills or those in clerical roles. This has raised worries about job loss, unemployment, and a growing divide between skilled and unskilled workers. However, the growth of AI is also creating new job opportunities in areas such as data analysis, machine learning, robotics, and managing AI systems. These fields require advanced technical and digital skills, which is driving changes in education, training, and skill development programs in India. The effect of AI on employment is not just about losing jobs but also about changing the nature of work and creating new kinds of jobs. This study looks at how AI is impacting employment in India by examining changes in job structures, the skills needed, and how different sectors are employing people. The study also wants to explore both the benefits and challenges of adopting AI and highlight the importance of government policies, skill development programs, and education reforms to help the workforce adapt to technological changes and take advantage of the digital transformation of the economy.

***Keywords*:** Artificial Intelligence, Employment, Automation, Indian Labour Market

Introduction

India is at a crucial point where technological changes, especially automation, robotics, and artificial intelligence (AI), are deeply changing how production, services, and daily work are done. Automation is no longer just for big factories; it is now part of retail logistics, financial services, manufacturing areas, back-office work, and even small service businesses. AI, machine learning, and data-driven systems are changing how companies hire, train, assess performance, and organize tasks. India's labor market, with its large informal workforce, growing platform-based jobs, and young population, presents both challenges and chances..

While automation brings benefits like increased productivity, cost savings, and better competitiveness, it also raises issues such as job loss, stagnant wages, job restructuring, and growing skill gaps.

National policies stress the importance of "augmented intelligence," AI-driven productivity, and rescaling. However, there is still limited evidence on how automation and AI are affecting employment in India. Most existing studies are global in scope or based on company-level stories. AI and automation are changing work across different areas in India, from global capability centers and IT services to manufacturing, retail, and gig platforms. Government documents and skills reports focus on both the risks of job changes and the possibility of creating new, more skilled roles; policy discussions now center around how to manage these changes, upskill workers, and ensure fair outcomes. For example, the Economic Survey 2024–25 refers to the future of work as "augmented intelligence" and shows how vulnerable India is due to its service-based economy.

Background of Artificial Intelligence on Employment

Artificial Intelligence (AI) and advanced automation technologies are changing labor markets worldwide. Due to fast progress in machine learning, robotics, data analytics, and digital platforms, AI systems are now able to perform tasks that once needed human labor. Their impact is seen in manufacturing, services, agriculture, logistics, finance, healthcare, and education. As a result, employment structures, skill demands, and workplace processes are undergoing significant change.

Review of Literature

Autor, Levy & Murnane (2003) established the task-based framework showing that routine, repetitive tasks are most susceptible to automation. Frey and Osborne (2017) estimated probabilities of computerisation across occupations, popularising global fears of massive job

displacement. Recent work (Acemoglu & Restrepo, 2020) emphasises the "displacement effect" versus the "productivity effect" of AI: some jobs vanish while others emerge. Studies on AI adoption show skill-biased technological change high-skill jobs grow while middle-skill routine jobs decline. Macro and policy evidence: India's recent policy papers and Economic Survey emphasize both risk and opportunity from AI adoption and call for tripartite actions (government, firms, and workers). Skills & susceptibility: India Skills Report and other studies estimate a significant share of tasks are susceptible to automation by 2030, stressing urgent skilling reforms. Firm & worker perceptions: Recent IIMA research and industry reports show heterogeneous firm-level adoption patterns and mixed worker perceptions-some sectors exhibit rapid role creation (AI orchestration), while routine white-collar tasks decline

Table-1Growth of Artificial Intelligence Market in India

Year	AI Market Size (USD Billion)
2018	3.1
2019	4.2
2020	6.4
2021	8.0
2022	11.3
2023	13.8
2024	15.7
2027 (Projected)	17–20

Source: NASSCOM (2024); Deloitte India AI Report (2023)

The data in Table-1 shows the rapid growth of the Artificial Intelligence (AI) market in India from **2018 to 2024**. In **2018**, the market size was **USD 3.1 billion**, which increased to **USD 4.2 billion in 2019** and **USD 6.4 billion in 2020**, showing rising adoption of AI technologies. The market further expanded to **USD 8.0 billion in 2021** and **USD 11.3 billion in 2022**, indicating significant investment in digital transformation. By **2023**, it reached **USD 13.8 billion**, and **USD 15.7 billion in 2024**. The market is projected to reach **USD 17–20 billion by 2027**, reflecting strong growth and increasing use of AI across various sectors in India.

Table-2 shows how the number of AI professionals in India has rapidly increased from 2019 to 2024, with projections for 2027. In 2019, India had around 150,000 AI professionals, which went up to 210,000 in 2020 because of rising demand for digital technologies.

Table-2 Growth of AI Workforce in India

Year	Number of AI Professionals
2019	150,000
2020	210,000
2021	310,000
2022	380,000
2023	400,000
2024	420,000

2027 (Projected)	1,250,000

Source: NASSCOM & BCG Report on AI Talent (2024)

The workforce further grew to 310,000 in 2021 and 380,000 in 2022, showing expanding AI use in various industries. In 2023, the number reached 400,000, and by 2024, it rose to 420,000. The table projects that the AI workforce could reach 1,250,000 by 2027, showing strong growth in

AI-related employment and the rising importance of technical and digital skills in India.

Table-3 AI Job Creation Trends

Year	AI Job Postings
2020	120,000
2021	170,000
2022	220,000
2023	250,000
2024	280,000
2025	290,000
2026 (Expected)	380,000

Source: NASSCOM & BCG Report on AI Talent (2024)

Table-3 shows the increasing trend of AI job postings in India from 2020 to 2026.

In 2020, there were about 120,000 AI-related job postings, indicating the start of strong demand for AI professionals. The number increased to 170,000 in 2021 and 220,000 in 2022, showing rapid growth from digital transformation and automation in various industries. In 2023, job postings reached 250,000, and further increased to 280,000 in 2024. By 2025, the number rose to 290,000 jobs. The table also shows that AI job postings are expected to reach around 380,000 in 2026, reflecting growing demand for skilled professionals in AI, data science, and machine learning.

Table-4 Sector-wise AI Employment Distribution

Sector	Share of AI Employment (%)
Information Technology	37%
Banking & Financial Services	15.8%
Manufacturing	6.3%
Healthcare	5.5%
Retail & E-commerce	5%
Telecommunications	4%
Others	26.4%

Source: Deloitte AI Adoption Survey (2023)

Table 4 shows the distribution of AI jobs across different sectors in India.

The Information Technology sector has the largest share with 37%, meaning most AI-related jobs are in IT services, software development, and data analytics. The Banking and Financial

Services sector accounts for 15.8%, where AI is used for fraud detection, risk analysis, and customer service automation. The Manufacturing sector holds 6.3%, followed by healthcare with 5.5%, where AI supports diagnostics and medical research. Retail and E-commerce contribute 5%, while Telecommunications accounts for 4%. The remaining 26.4% belongs to other sectors such as education, transportation, and agriculture, showing the wide application of AI across industries..

Table-5 Jobs at Risk from AI Automation

Occupation	Automation Risk (%)
Data Entry Operators	70%
Customer Service Representatives	65%
Telemarketing	60%
Clerical Jobs	55%
Routine Software Testing	50%
Accounting Clerks	45%

Source: World Economic Forum – Future of Jobs Report (2023)

Table 5 shows the occupations most at risk of automation due to the increasing use of AI and advanced technologies.

Data Entry Operators face the highest risk at 70%, as AI systems can easily process and organize data. Customer Service Representatives have a 65% risk, because chatbots and virtual assistants can handle many customer queries. Telemarketing jobs show a 60% risk, as automated calling systems and AI marketing tools are replacing manual work. Clerical jobs (55%) and Routine Software Testing (50%) are also affected due to automation tools. Accounting Clerks, with a 45% risk, may be partially replaced by AI-based accounting software and financial management systems.

Conclusion

The analysis of various data tables in this study shows that AI has become an important technological force influencing different industries. The steady growth of the AI market in India indicates that businesses are increasingly adopting AI technologies to improve productivity, efficiency, and decision-making processes. As a result, the demand for AI-related skills and professionals has increased significantly in recent years. The data on AI workforce growth reveals that the number of AI professionals in India has increased considerably over the past few years. This increase reflects the growing need for experts in areas such as machine learning, data science, robotics, and artificial intelligence development. The rising number of AI job postings further confirms that many companies are actively hiring skilled professionals to support digital transformation and innovation. Sectors such as Information Technology, Banking and Financial Services, Manufacturing, Healthcare, and Telecommunications are

increasingly using AI technologies to enhance their operations. However, the study also highlights that AI and automation may pose challenges for certain types of jobs. Occupations involving repetitive, routine, and rule-based tasks are more vulnerable to automation. Jobs such as data entry operators, customer service representatives, telemarketing staff, and clerical workers face a higher risk of being replaced by automated systems and AI-powered tools. This shift may lead to changes in employment patterns and require workers to adapt to new technological environments.

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