

8.**The impact of AI on Job creation in India – A study****Dr. M. Manoj Kumar**

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Abstract

The integration of AI into workplaces necessitates a workforce equipped with new skills. There is a growing demand for expertise in fields such as data science, machine learning, and AI development, resulting in new job opportunities focused on managing, maintaining, and advancing AI technologies. AI serves as a force multiplier, enabling humans to concentrate on higher-order tasks that require creativity, critical thinking, and emotional intelligence. Instead of replacing workers, AI augments human capabilities, leading to a more dynamic and productive workforce. Traditional industries are experiencing a shift as AI becomes more prevalent. For instance, manufacturing is evolving with the emergence of smart factories, which create jobs in AI-driven production and maintenance, changing the way products are created and delivered. The present paper made an attempt to study how AI and automation are transforming the Indian job market and to examine AI potential socio-economic impact, and suggest policy measures to harness their benefits while mitigating adverse effects to meet these objective secondary sources which include books, journals, articles and newspapers, websites.

Keywords: AI, Automation, Business, Marketing, Employment**Introduction**

India, known for its developing population and technological landscape, faces the challenge of Artificial Intelligence (AI) integration and its impact on job creation. As industries adopt AI technologies like machine learning and robotics to boost efficiency, concerns arise about employment. While AI can create new roles and transform existing ones, there are fears of job displacement as AI automates tasks traditionally done by humans.

An IMF analysis reveals that nearly 40% of global employment is exposed to AI. In advanced economies, around 60% of jobs could be affected, with half benefiting from AI

integration and the other half facing reduced labor demand, potentially leading to job losses and lower wages.

Conversely, emerging markets and low-income countries have lower AI exposure rates of 40% and 26%, respectively, suggesting fewer immediate disruptions. However, these nations often lack the infrastructure and skilled workforce to harness AI's benefits, which could worsen global inequality over time. Overall, AI presents both challenges and opportunities for the future of work.

Objectives of the study

1. To study how AI and automation are transforming the Indian job market.
2. To examine AI potential socio-economic impact, and suggest policy measures to harness their benefits while mitigating adverse effects.

AI and Automation

AI refers to the development of computer systems capable of performing tasks that normally require human intelligence, such as learning, decision-making, problem-solving, and language processing. Automation, on the other hand, involves the use of technology to perform tasks with minimal human intervention.

AI and automation are part of our daily digital interactions. Social media platforms like Facebook and Instagram use AI to suggest friends by analyzing your activity. Netflix and Prime Video recommend shows based on your viewing history, while Google's predictive search guesses what you're looking for as you type. In e-commerce, AI helps filter products, making it easier to find what you want quickly. These technologies personalize and streamline our online experiences, enhancing convenience and efficiency. Together, AI and automation are revolutionizing industries, enabling machines to handle not just repetitive tasks but also complex decision-making processes.

Key Technologies Driving AI and Automation

- AI and automation are powered by several key technologies that enable systems to operate more efficiently and effectively across various sectors.
- Machine Learning (ML) is a prominent subset of AI that empowers systems to learn from data and improve over time without the need for explicit programming. This capability allows organizations to develop applications that can adapt to new information and make informed decisions based on patterns in data.
- Robotics plays a critical role in automation by utilizing machines that can perform physical tasks, often autonomously or semi-autonomously. These robots are increasingly deployed in industries such as manufacturing, logistics, and healthcare, streamlining operations and enhancing productivity.
- Natural Language Processing (NLP) is another vital technology that enables AI systems to understand and process human language. This capability facilitates various applications, including translation services, chatbots, and virtual assistants, enhancing communication and user interaction.

- Finally, Automation Tools, such as Robotic Process Automation (RPA), automates repetitive tasks across sectors like finance, healthcare, and manufacturing. By taking over mundane and time-consuming activities, RPA allows human workers to focus on more complex and value-added tasks, ultimately improving operational efficiency.

Together, these technologies are driving the transformative potential of AI and automation, reshaping industries and redefining how we work and interact with machines.

AI and Employment Global

Recent reports from Goldman Sachs indicate that AI could threaten up to 300 million jobs globally, with two-thirds of roles in the US and Europe at risk. In the UK, a survey of 22,000 job types suggests AI could impact around eight million jobs, with 11% of tasks already exposed to automation.

White-collar workers earning around USD 80,000 are particularly vulnerable, as highlighted by a University of Pennsylvania report. Roles in customer service, accounting, sales, research, and retail face significant disruptions.

The McKinsey Global Institute predicts that by 2023, 14% of employees may need to change careers due to AI advancements. As the job market evolves, both employees and employers must adapt to these changes, focusing on reskilling and embracing new opportunities in an increasingly automated world.

India

The IT industry in India has been a major employer, providing over 5.4 million jobs and creating numerous opportunities for fresh engineering graduates. However, the rise of AI poses challenges to this landscape.

As companies work to become "AI-ready" through employee reskilling, technologists warn of a potential white-collar recession in India by 2027.

AI will also affect blue-collar jobs in India, impacting about 300 million workers in sectors like manufacturing and healthcare. While advanced robotics may automate some tasks, mass job losses are unlikely, as AI is expected to enhance productivity rather than replace workers entirely.

AI Transforming Sectors

AI is reshaping various sectors in India, enhancing efficiency, improving services, and transforming customer experiences in sectors such as services, healthcare, industry and finance.

The Economic Survey 2023-24 highlights the varying impacts of AI across different sectors of the economy. The manufacturing sector is relatively less affected by AI, as industrial robots lack the flexibility and cost-effectiveness of human labor. While automation is present, it does not significantly displace workers.

Service Sector

The service sector is witnessing substantial AI adoption, particularly in customer

service through the use of chatbots and virtual assistants. AI-powered chatbots such as Amazon India's Alexa-powered voice assistant are revolutionizing customer support by providing instant responses and personalized interactions enabling customers to shop, track orders, and get product recommendations through voice commands. This not only improves customer experiences but also streamlines operations and optimizes resource allocation, allowing businesses to operate more efficiently.

Healthcare Sector

In the Indian healthcare industry, AI is making significant strides. AI-driven diagnostic tools, medical imaging analysis, and predictive analytics are enhancing the accuracy and efficiency of healthcare services. Moreover, AI-powered telemedicine platforms are improving access to healthcare in rural and remote areas, addressing the challenge of healthcare delivery in a vast and diverse country like India. By leveraging AI, the healthcare sector can provide timely and effective services, ultimately benefiting patients and practitioners alike. An Indian government-developed app Aarogya Setu using AI that provided COVID-19 information.

Financial Sector

The financial sector is rapidly embracing AI technologies such as HDFC Bank's Eva AI powered-chatbot, for various applications, including fraud detection, risk assessment, credit underwriting, and personalized financial services. AI algorithms can analyze vast amounts of data in real-time, enabling financial institutions to make informed decisions quickly and efficiently. As a result, the demand for AI experts in finance is growing, as companies seek to leverage AI's capabilities for better risk management and enhanced customer experiences.

New Opportunities for Job Creation

As AI continues to infiltrate various industries, the employment landscape is undergoing a significant transformation. Rather than simply replacing jobs, AI is reshaping existing roles and creating new opportunities. The World Economic Forum (WEF) anticipates that AI will generate 12 million more jobs than it displaces by 2025.

According to the 2019 report by the Ministry of Electronics and Information Technology (MeitY), by 2025, digital interventions, including AI, are projected to redeploy approximately 40-45 million workers in India through retraining and reskilling. Furthermore, around 20 million new jobs are expected to be created, particularly in sectors such as IT-BPM, manufacturing, agriculture, and transport and logistics.

According to a 2020 report by NASSCOM, AI and data could contribute between USD 540 billion to 500 billion to India's GDP by 2025. Approximately 45% of this value is expected to come from three key sectors: consumer goods and retail, agriculture, and banking and insurance. Additional sectors that will also contribute include telecom, media and IT, energy, transport and logistics, auto manufacturing and assembly, and healthcare.

While routine and repetitive tasks are more susceptible to automation, the introduction of AI often leads to the redefinition of job roles. Employees are increasingly

collaborating with AI systems to enhance productivity and efficiency, allowing them to focus on more complex and engaging tasks.

The integration of AI into workplaces necessitates a workforce equipped with new skills. There is a growing demand for expertise in fields such as data science, machine learning, and AI development, resulting in new job opportunities focused on managing, maintaining, and advancing AI technologies.

AI serves as a force multiplier, enabling humans to concentrate on higher-order tasks that require creativity, critical thinking, and emotional intelligence. Instead of replacing workers, AI augments human capabilities, leading to a more dynamic and productive workforce.

Traditional industries are experiencing a shift as AI becomes more prevalent. For instance, manufacturing is evolving with the emergence of smart factories, which create jobs in AI-driven production and maintenance, changing the way products are created and delivered.

The democratization of AI technologies empowers entrepreneurs to explore innovative business opportunities. Startups are emerging in sectors like AI consulting and the customization of AI solutions for niche markets, fostering economic growth and job creation.

The focus is shifting from merely increasing the number of jobs to enhancing the quality of employment. By automating mundane tasks, AI has the potential to elevate job quality, allowing employees to engage in more meaningful and fulfilling work.

Job Losses

In India, the challenge lies in the ability to retrain workers and enable them to transition to new roles created by AI. India's manufacturing sector has traditionally been labor-intensive, with a large number of low-skilled and semi-skilled workers employed in industries such as textiles, automobile, and electronics. However, the advent of automation technologies like robotic process automation, AI-powered machinery, and 3D printing is reducing the demand for manual labor, especially in assembly-line tasks.

A report by the McKinsey Global Institute estimates that automation could displace up to 60 million workers in India's manufacturing sector by 2030, particularly impacting jobs in textiles and electronics.

The IT and services sectors, which are integral to India's growth story, are also undergoing significant transformations. While India has been a global hub for IT services, the automation of basic IT tasks (such as coding, testing, and system maintenance) is reducing the need for entry-level jobs.

India's vast informal workforce is particularly vulnerable to technological disruptions. Without formal job contracts or social security, displaced workers may find it challenging to cope with the transition. Approximately 90% of India's workforce is employed in the informal sector, which is especially susceptible to automation, as these workers often lack access to retraining programs and support systems.

Automation-driven industries are more concentrated in urban areas, while rural

economies remain heavily dependent on agriculture and traditional industries. A World Bank report suggests that rural-to-urban migration is expected to increase as automated jobs grow in cities, leading to challenges like urban congestion and pressure on infrastructure.

Without targeted policies, automation may lead to greater rural-urban migration and uneven development.

Agriculture remains the largest employer in India but is also the least automated sector. The adoption of AI and automation in agriculture could lead to more efficient practices, reducing waste and increasing yields.

AI and automation could exacerbate existing inequalities. Low-skilled workers are more vulnerable to job losses, while those with advanced technical skills are likely to benefit. This could widen the income gap and deepen socio-economic divides.

Mitigating Job Displacement

A crucial step in mitigating job displacement is investing in education and training initiatives focused on upskilling and reskilling the workforce. Both government and industry must collaborate to develop programs that equip workers with the necessary skills in emerging technologies, including AI. By ensuring that individuals are prepared for the digital economy, we can facilitate a smoother transition and reduce the risk of job loss.

Recently, Upskilling Trends Report 2024-25 released by a global ed-tech company Great Learning found that 67.5% of engineers feel their jobs are being negatively impacted by AI, while 87.5% believe that upskilling is critical to safeguarding their careers in the face of technological disruption.

Skill India Mission, launched in 2015 aims to equip workers with the skills necessary for the evolving job market. One of its flagship programs, the Pradhan Mantri Kaushal Vikas Yojana (PMKVY), offers training in crucial areas such as AI, machine learning, robotics, and data analytics. By focusing on these emerging technologies, the mission seeks to enhance the employability of the Indian workforce.

Digital India Mission focuses on digital literacy and promoting technology adoption across sectors

A strong social security framework is essential for informal workers, providing benefits like unemployment support, health insurance, and pensions. Additionally, promoting the formalization of the workforce will better protect those affected by automation. By offering these safety nets, we can help ensure that workers have the support they need to navigate the challenges of a rapidly evolving job market.

To foster innovation and AI start-ups, the government should continue supporting AI initiatives through incubators, funding, and research and development efforts. Public-private partnerships can further stimulate growth in sectors like healthcare, agriculture, and manufacturing.

Promoting inclusive growth is crucial. Targeted policies must bridge the urban-rural divide, ensuring that the benefits of automation reach rural areas and focusing on sectors

such as agriculture and Micro, Small, and Medium Enterprises (MSMEs), which employ a significant portion of the workforce.

Encouraging entrepreneurship and innovation is another effective strategy for creating new job opportunities. By fostering a culture of entrepreneurship, we can stimulate job creation in AI-related startups and small businesses. Supporting initiatives that provide resources, mentorship, and funding for aspiring entrepreneurs can lead to innovative solutions and resilient business models that adapt to the changing landscape.

The Atal Innovation Mission (AIM) is a key initiative that promotes innovation and entrepreneurship in AI and automation. It has set up Atal Tinkering Labs in schools to inspire creativity and problem-solving among students, along with Atal Incubation Centers to support AI-driven start-ups.

In 2018, NITI Aayog launched the National Strategy for Artificial Intelligence, focusing on using AI for inclusive growth. The strategy identifies five key sectors for intervention: healthcare, agriculture, education, smart cities, and mobility. By targeting these areas, the government aims to harness AI's potential to enhance development and improve citizens' quality of life.

While National Education Policy 2020 suggests greater use of technologies such as AI, it must be aligned with the demand of the job market. Considering the risk of job loss across industries, the government must embark on a life-long learning platform. Initiatives such as "FutureSkills PRIME" cover emerging technologies, including AI, which must be strengthened. YUVAi (Youth for Unnati and Vikas with AI), an initiative for familiarizing school students from classes 8-12 with AI technologies, should be expanded.

Labour in the AI Era:

Crisis or catalyst

A Future for human centric automation Deployment of AI presents both opportunities and challenges for a labour rich India Past techonolgy revolutions, when not carefully managed, have been painful with long-lasting adverse impacts Mitigating the risks to India's labour markets requires robust Enabling, Insuring, and Stewarding Institutions Careful deployment optimised over a long horizon can ensure AI augments labour and delivers broad-based societal benefits Coordinated efforts between the government, private sector, and academia is required for a future of work where AI is 'Labour Augmenting' rather than 'Labour Replacing'

Challenges to scaling AI

Practicality

Translating breakthroughs into practical, widely adopted applications remains challenging, as AI currently shows experimental and uneven utility

Reliability

Ensuring AI reliability is critical for real-world applications, as failures in key industries like autonomous vehicles or healthcare can prove problematic

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Infrastructure

AI at scale requires substantial investments in infrastructure, including data centres, clean data pipelines, and computational resources

Resources

Large Models are resource intensive, requiring high energy consumption, dependency on scarce minerals for hardware, and finance, making sustainable innovation essential

Conclusion

AI is reshaping the Indian job market by creating new opportunities while posing challenges, particularly regarding job displacement due to automation. As demand for AI specialists and skilled professionals grows, India must prioritize investment in skill development and establish a robust AI research ecosystem. By addressing ethical considerations and adopting a strategic approach to AI integration, India can emerge as a global leader in the AI-driven digital economy, fostering inclusive and sustainable economic growth for its workforce.

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