



# The Impact of Artificial Intelligence on Employment trends

**Akash Hugar<sup>1</sup>, Manikanta Reddy<sup>2</sup>, Prof Swarooparani H Manoor<sup>3</sup>**

MCA student, Department of MCA, K.L.S. Gogte Institute of Technology, Belagavi, Affiliated to Visvesvaraya Technological University, Belagavi, Karnataka, India<sup>1</sup>

MCA student, Department of MCA, K.L.S. Gogte Institute of Technology, Belagavi, Affiliated to Visvesvaraya Technological University, Belagavi, Karnataka, India<sup>2</sup>

Assistant Professor, Department of MCA, K.L.S. Gogte Institute of Technology, Belagavi, Affiliated to Visvesvaraya Technological University, Belagavi, Karnataka, India<sup>3</sup>

**Abstract:** This study looks at how artificial intelligence (AI) is affecting the labour market and how the global workforce is changing as a result of the technology's quick development. It looks at how AI affects migration, employment growth, and the economy overall using research techniques, empirical data, and a review of the literature. The report highlights that although AI has the potential to generate new employment opportunities, it also poses the risk of displacing current positions in a range of sectors, including customer service and manufacturing. AI's increased efficiency may result in job losses, hence upskilling, retraining, and other support measures are necessary to adjust to these changes and encourage the creation of jobs in other industries.

**Keywords:** Artificial Intelligence, Job Creation, Job Displacement, Job Market.

## I. INTRODUCTION

The global labour market is being drastically altered by artificial intelligence (AI), which is also changing sectors and worker dynamics. This essay examines artificial intelligence's dual effects, emphasising its advantages and disadvantages. Although AI automation features boost output and efficiency, there is a chance that they will significantly alter the workplace, particularly for repetitive activities. Artificial intelligence's introduction into industries like manufacturing and customer service will have a significant effect on the growth of employment. This study offers a thorough overview of the changing job landscape in the era of artificial intelligence by evaluating the body of existing literature, applying sound research techniques, and relying on actual data. It examines how AI is affecting the creation and transformation of jobs and urges businesses and policymakers to take proactive measures in response. The adoption of AI is accelerating..[4].

## II. DESCRIPTION

This paper explores the transformative impact of artificial intelligence (AI) on the global labor market, highlighting both the opportunities and challenges. It explores the potential of artificial intelligence to create new jobs in fields such as data science and robotics, while also threatening routine and manual roles. Using a comprehensive literature review, robust research methods and empirical evidence, the study analyzes how artificial intelligence is shaping workforce dynamics across industries. It includes case studies, such as Amazon's integration of AI, to illustrate the impact on employment. The document underlines the importance of upskilling, reskilling and strategic workforce planning, and calls for coordinated action by policymakers and businesses to support continuous learning and workforce adaptation, ensuring a smooth transition to an AI-driven economy.[1].

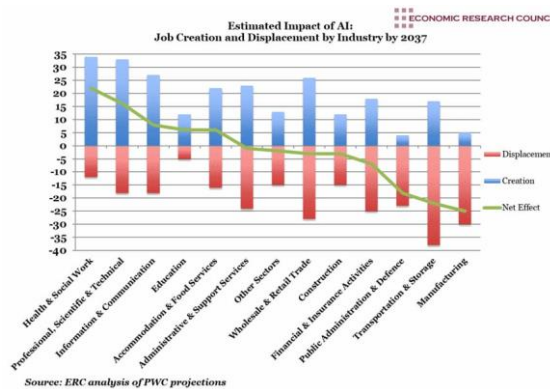
## III. LITERATURE REVIEW

The reviewed literature suggests that AI will replace routine jobs but will create new opportunities for AI, data science and related fields (Frey and Osborne, 2013; Brynjolfsson and McAfee, 2014; Acemoglu and Restrepo, 2020). State intervention is crucial in training and retraining programs (Doe, 2020) and polarization is observed where routine tasks are more susceptible to automation (Brynjolfsson and McAfee, 2014). The adoption of AI affects employment across sectors, with highly skilled workers benefiting more (Johnson, 2021) and a contrast between job growth in developed



economies and job creation in developing countries (Brown, 2018). Education and policy are important for managing labor migration and promoting inclusive economic growth (Adams et al., 2022; Martinez, 2019)[7].

Amazon's adoption of artificial intelligence and automation technologies has had a significant impact on the company's jobs, particularly in fulfillment centers, customer service and supply chain management. Artificial intelligence-powered robots and computer vision systems have reduced the need for manual labor in warehouses, while AI-based chatbots and virtual assistants have taken over routine customer service tasks, causing labor displacement[6]. However, this shift has created new technical and specialized roles in fields such as robotics technology, data science and artificial intelligence maintenance. In response to these changes, Amazon has implemented initiatives to strengthen skills, such as the Amazon Tech Academy and the Career Choice program, which pay in advance for courses in in-demand fields, helping employees transition to new careers. This case highlights the dual impact of AI on job mobility and creation, and highlights the importance of workforce development and continuous learning[2].



A chart from the Economic Research Council highlights the dual impact of AI on employment trends in the UK by 2037, showing both job creation and displacement across sectors. While AI is predicted to create nearly a million jobs in healthcare and social services due to an aging population and the need for human interaction, it also threatens significant job losses in the manufacturing sector, with nearly 700,000 jobs potentially lost to automation. In the wholesale and retail sector, the double effect is clear: both job creation (26%) and relocation (28%) reflect the transformative effects of e-commerce and automation. Education faces modest changes, indicating that while some administrative tasks may be automated, demand for human educators remains high. Overall, the net effect is a slight decline in employment, which underscores the importance of strategic workforce planning and skills development to address labor polarization and skill mismatches driven by artificial growth.[3]

Table 1: Demographic Characteristics of Survey Participants

| Variable  | Frequency   | Percentage |
|-----------|-------------|------------|
| Gender    | Male        | 50%        |
|           | Female      | 50%        |
| Age       | 18-30       | 30%        |
|           | 31-45       | 40%        |
|           | 46-60       | 20%        |
|           | 61+         | 10%        |
| Education | High School | 20%        |
|           | College     | 40%        |
|           | Graduate    | 40%        |

Table 2: Impact of AI on Job Security

| Response  | Frequency | Percentage |
|-----------|-----------|------------|
| Increased | 10        | 20%        |
| No Change | 30        | 60%        |
| Decreased | 10        | 20%        |

Table 3: Training and Up-skilling Requirements

| Response | Frequency | Percentage |
|----------|-----------|------------|
| Yes      | 40        | 80%        |
| No       | 10        | 20%        |



IV. METHODOLOGY

Research techniques A mixed-methods approach will be used as part of the study technique for the topic "Impact of Artificial Intelligence on Employment and Earnings". A thorough analysis of the body of research on the subject, including articles from scholarly journals, official documents, and trade publications, will be done for this. Data on the kinds of professions impacted, the skills and training needed, and the degree of job security are just a few of the facets of artificial intelligence's impact on employment and incomes that will be covered by the poll[4].

Hypothesis for research

1. The use of AI may cause established sectors to lose jobs, particularly in routine and repetitive work.
2. The use of AI leads to the establishment of new employment roles requiring sophisticated technical and cognitive skills.
3. Socioeconomic elements, like education.

**The impact of artificial intelligence on employment: the role of virtual agglomeration:**

The impact of artificial intelligence (AI) on employment is multifaceted, significantly transforming job markets through automation and the creation of new roles. AI-driven automation replaces repetitive and manual tasks, leading to job displacement in certain sectors, while simultaneously generating demand for AI-related skills and new job categories. Virtual agglomeration, the digital clustering of industries and talent, plays a crucial role in this dynamic. By leveraging online platforms and remote work technologies, virtual agglomeration facilitates knowledge sharing and collaboration across geographical boundaries, fostering innovation and enabling businesses to access a global talent pool. This shift mitigates some negative employment impacts, creating opportunities in diverse, digitally connected environments[6].

| Variable                      | Code | Mean   | Std. Dev. | Min.   | Max.   |
|-------------------------------|------|--------|-----------|--------|--------|
| Employment scale              | ES   | 13.648 | 1.055     | 11.114 | 16.138 |
| Artificial intelligence       | AI   | -4.292 | 1.707     | -9.209 | -0.046 |
| Road accessibility            | RA   | 9.653  | 0.851     | 6.918  | 11.535 |
| R&D                           | RD   | 10.995 | 1.194     | 7.867  | 13.361 |
| Wage cost                     | WC   | 10.770 | 0.515     | 9.654  | 12.128 |
| Industrial structure          | IS   | 1.105  | 0.641     | 0.499  | 5.297  |
| Virtual agglomeration         | VA   | 0.722  | 0.966     | -1.499 | 2.824  |
| Marketization                 | MK   | 1.849  | 0.314     | 0.846  | 2.485  |
| Macrocontrol                  | MC   | -1.549 | 0.398     | -2.481 | -0.442 |
| Urbanization                  | UR   | 3.991  | 0.243     | 3.313  | 4.495  |
| Capital deepening             | CD   | 4.114  | 0.651     | 2.628  | 5.851  |
| Division of labour refinement | DLR  | 13.548 | 0.804     | 11.463 | 15.472 |
| Labour productivity           | LP   | 12.604 | 0.411     | 11.428 | 13.467 |

| Variable          | (1)              | (2)              | (3)                       | (4)             | (5)              |
|-------------------|------------------|------------------|---------------------------|-----------------|------------------|
| AI                | 0.368*** (17.16) | 0.287*** (10.01) | 0.003 <sup>†</sup> (1.77) | 0.439*** (7.94) | 0.989*** (33.30) |
| Control variables | No               | Yes              | No                        | Yes             | Yes              |
| Individual effect | No               | No               | Yes                       | Yes             | Yes              |
| Time effect       | No               | No               | No                        | No              | Yes              |
| R-square          | 0.3536           | 0.9551           | 0.0441                    | 0.6762          | 0.9660           |

Note: \*\*\* and \* are significant at the 10% and 1% levels, respectively, and t statistics are displayed in parentheses.

| Variable          | Robustness      |                  |          | Endogenous        |                 |
|-------------------|-----------------|------------------|----------|-------------------|-----------------|
|                   | Method 1        | Method 2         | Method 3 | First stage       | Second stage    |
| AI                | 0.535*** (8.31) | 0.978*** (32.18) | 0.843    | 10.701*** (12.88) | 0.239*** (5.03) |
| IV                |                 |                  |          |                   |                 |
| Control variables | Yes             | Yes              | Yes      | Yes               | Yes             |
| Individual effect | Yes             | Yes              | Yes      | Yes               | Yes             |
| Time effect       | Yes             | Yes              | Yes      | Yes               | Yes             |

Fig 4.a Descriptive statistics of the variables



V. APPLICATIONS OF AI

Artificial Intelligence has several applications in today's society. It is becoming essential for today's time because it can solve complex problems with an efficient way in multiple industries, such as Healthcare, entertainment, finance, education, etc. AI is making our daily life more comfortable and fast. Following are some sectors which have the application of Artificial Intelligence.[2]

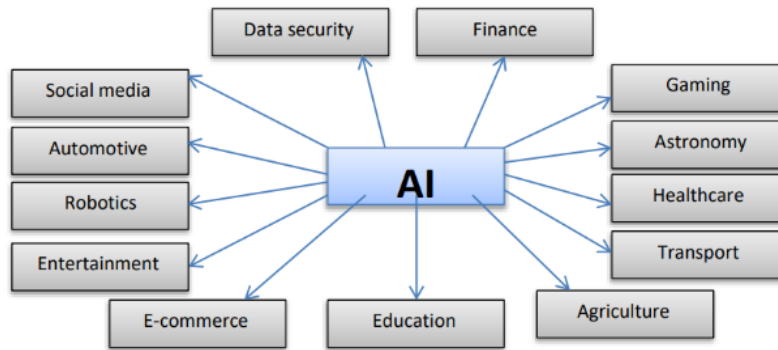


Fig 4.a AI and Different Fields

| Sector        | Share (in %) |
|---------------|--------------|
| Telecom       | 49           |
| Retail        | 41           |
| Banking       | 36           |
| Utilities     | 34           |
| Insurance     | 31           |
| Automotive    | 26           |
| Manufacturing | 20           |

Source: Capgemini (2017)

Fig 4.b Share of AI Implementers that are Deploying AI at Scale (by sector).

Some studies have estimated the impact of AI on jobs at sectoral levels :

Capgemini (2017), based on their extensive survey from companies implementing AI stated that sector-wise the share of AI deployment at scale has been as follows in the Table . The study found that the sectors such as telecom, retail, and banking have seen the highest implementation of AI at scale with (49%), (41%) and (36%) respectively.[2]

VI. CONCLUSION

The impact of artificial intelligence on the labor market is complex and brings with it both opportunities and challenges. Artificial intelligence can create new jobs in advanced fields such as data science and robotics, but it also threatens to displace routine and manual roles. This double effect requires strategic measures such as upskilling and retraining to help workers adapt. Empirical evidence shows that AI-based automation improves efficiency but can cause job losses, especially in manufacturing and customer service. Programs like the Amazon Tech Academy illustrate successful workforce adaptation strategies. Governments and businesses must work together to support continuous learning and skills development to prepare workers for new opportunities. The polarization of job growth between developed and developing economies underscores the need for tailored approaches. Developed economies will see more benefits from highly skilled workers, while job creation in developing countries may slow due to lags in technology adoption. In conclusion, proactive measures are needed to maximize the benefits of AI and mitigate its challenges. Strategic workforce planning that focuses on skills development and ongoing training is critical. By growing an adaptive workforce, we can ensure a smooth transition to an AI-based economy that is inclusive and beneficial for all[8].



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