

# The impact of artificial intelligence on employment before during and after pandemic: A comparative analysis

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**Abstract - Purpose -** The purpose of this paper is to understand and research about the impact of artificial intelligence on employment before during and after pandemic.

**Research Implication –** This paper provides a preliminary understanding of the role of AI in the era of industrial 4.0 and its impact on employment during and after pandemic. Further research might use alternative methods and this paper might make use of secondary research method that is on already existing data.

**Findings -** The paper examines the use and growing importance of artificial intelligence and industry 4.0, as well as their function in the post-pandemic era, in light of pandemic limits in many sections of the economy.

**Originality/Value –** Innovative and revolutionary intelligence and data technologies spawned the fourth industrial revolution, which is known as Industry 4.0. The emerging innovations are allowing for ever-increasing rates of productivity. This paper presents the role of AI in the era of industrial 4.0 and its impact on employment during and after pandemic.

**Keywords –** Industry 4.0, technology, technology acceptance; work engagement, pandemic, Covid 19.

## INTRODUCTION

Technological advances, particularly digitalization, have a significant impact on labour markets. It will be critical to assess its impact in order to design policies that encourage efficient labour markets for the benefit of employees, businesses, and society. Rapid technological advancement and innovation have the potential to put jobs at risk. This fear isn't new; it dates back to the 1930s, when John Maynard Keynes proposed the "technological unemployment hypothesis," which contends that technical improvement leads to job loss (Keynes 1937).

Employment can be influenced by technological advancements in two ways:

- by directly displacing employees from previously performed duties (displacement impact);

- by raising demand for labour in sectors or jobs that emerge or expand as a result of technological development (productivity effect).

In normal tasks, whether manual or intellectual, technology may be able to replace physical labour, but not in non-routine ones (at least not yet). The effect of technology leads to an increase in relative demand for highly-paid skilled professions that need non-routine cognitive abilities, as well as a decrease in relative demand for low-paid, least-skilled employment that require non-routine physical skills.

'Middle' vocations, which often need regular manual and cognitive skills, will see a reduction in demand. Some scholars have used the term "job polarisation" to characterise this phenomenon. Managerial, engineering, and health-care jobs are growing, whereas middle-level jobs (clerks, machine operators, and assemblers) are shrinking. In contrast, despite being non-standard and difficult to automate, the number of low-education service positions, such as shop personnel, is expanding. One of the most noteworthy discoveries is that technology has been incorporated into a small percentage of basic job functions formerly performed by middle-skill workers, resulting in major change.

Human capital quality is also crucial. Individuals' ability to use technological breakthroughs to their advantage requires the development of certain digital skills via well-designed rules. This emphasises the significance of adopting the appropriate tools to guarantee that employees are well-prepared to cope with the disruptive forces of digital technology. In the future, a new wave of automation and improved machine-learning algorithms will enable intelligent robots to do high-skill and maybe non-routine tasks. As we go beyond the efficiency benefits of online commerce to the extensive use of artificial intelligence systems in our industrial production, concerns about prospective job displacement grow.

Furthermore, in the AI era, the continual development of deep machine-learning algorithms that use the function and complexity of the human brain as a design model is the basic engine of technological innovation. Intelligent machines are being programmed, which has implications for the workforce.

#### LITERATURE REVIEW

1. Petropoulos, G. (2018). In his paper The impact of artificial intelligence on employment highlighted that the quality of human capital is also important. Individuals' capacity to employ technology advancements for the advantage of their profession necessitates the development of certain digital skills through well-designed regulations. This paper relied on primary research methodology. The findings stated that however, technical advancements can have an impact on employment in two ways: by directly displacing employees from activities, they previously performed (displacement effect) and by raising demand for labour in businesses or positions that emerge or expand as a result of technological advancement (productivity effect).
2. Abuselidze, G. and Mamaladze, L. (2021, March) In their paper The impact of artificial intelligence on employment before and during pandemic: A comparative analysis analysed that the usage of artificial intelligence 4.0 industry and its rising relevance in the context of pandemic constraints in many areas of the economy, as well as its function in the post-pandemic era. Both qualitative and quantitative research methodologies are used in this work. It includes a content study of scientific literature, statistical indicators, and practical examples from various nations and international organisations. Leading analytical institutes' studies are also provided to analyse the existing status and future possibilities.
3. Webb, M. (2019) In his paper The impact of artificial intelligence on the labor market highlighted that to develop a measure of task exposure to automation, consider the overlap between the text of employment task descriptions and the text of patents. This research relied on primary research methodology. In contrast to software and robotics, the data revealed that AI is aimed at high-skilled tasks. The study estimates that

AI will lower 90:10 wage disparity, but will have no effect on the top 1%, if past trends of long-run replacement remain.

#### RESEARCH OBJECTIVES

- To analyse the impact of AI on employment during, before and after Pandemic.
- To determine how has AI affected Labour and Manpower.
- To analyse how machines and AI Are Taking Over Jobs Lost to Coronavirus.

#### HYPOTHESIS

1. "Our culture is naturally afraid of AI, especially in an unpredictable pandemic economy with record-breaking unemployment," says Wendy Gonzalez, CEO of Sama, a digital training platform located in Los Gatos, California, that counts Google, Walmart, and Nvidia among its clients. "With that in mind, we feel it's critical for firms in the field to not just address AI applications, but also to reassure their workers, communities, and society about the possibilities the technology may provide." Other founders, like Gonzalez, recognised the validity of these societal issues and delegated responsibilities to executives. "It starts with corporate accountability and responsibility," says Jason Lopatecki, CEO of Arize AI, a real-time analytics platform that monitors AI deployments. "Companies that substantially engage in machine learning and AI must be deliberate in how they use this technology to improve the lives of their customers, workers, communities, and society as a whole."
2. People have long claimed that technology is a precursor to the end of the labour market. Why are there so many job openings? David Autor, an economist at MIT According to The History and Future of Workplace Automation, the Luddite movement of the early nineteenth century was one of the first instances, in which a group of English textile craftsmen revolted against the automation of textile manufacture by trying to destroy some of the machines. This was not the case, and basic economics had to intervene. Because of automation, fabric manufacturing became more economical, resulting in more customers and increasing demand for new things. Although the

job may have altered, semi-skilled labourers did not face a labour shortage throughout the industrial revolution.

3. For millennia, technology have rendered labour useless. Spinner jennies replaced weavers, elevator operators replaced buttons, and travel companies were supplanted by the Internet. Based on one analysis, between 1990 and 2007, over 400,000 industrial employments in the United States were lost due to automation. However, as companies seek to save costs while reducing COVID-19 infections, the temptation to replace humans with technology is rising. During the height of the epidemic, the United States lost over 40 million jobs, and although some have since returned, others will never do so. Based to one group of economists, long-term occupations account for 42 percent of the lost jobs.

#### RESEARCH QUESTIONS

1. What has been the impact of AI on employment during, before and after Pandemic?
2. How has AI affected Labour and Manpower?
3. How machines and AI Are Taking Over Jobs Lost to Coronavirus?

#### RESEARCH METHODOLOGY

This research began with a thorough literature review to identify the important aspects of essential human capacity knowledge and abilities, as well as the primary orientations of a needed strategy. This paper relied on secondary research method that is on already existing data.

#### FINDINGS

Technological advances, particularly digitalization, have a significant impact on labour markets. It will be critical to assess its impact in order to design policies that encourage efficient labour markets for the benefit of employees, businesses, and society. Rapid technological advancement and innovation have the potential to put jobs at risk. This fear isn't new; it dates back to the 1930s, when John Maynard Keynes proposed the "technological unemployment hypothesis," which says that technical development leads to job loss (Keynes 1937).

The essential question is: in the AI age, which of the two labour market outcomes — displacement or productivity – will win out? 3 Examining the influence of technical breakthroughs on labour markets throughout prior industrial revolutions is one way to begin answering this issue (Soete this volume). For example, the introduction of vehicles into daily life resulted in the loss of horse-related occupations, but new businesses arose as a result, resulting in a net increase in employment. The automotive industry expanded quickly, resulting in the creation of many new employment, but other businesses also profited from the increased number of automobiles on the road. Many new possibilities in the hotel and fast-food industries have been formed to service motorists and truck drivers. Further case studies, according to The Economist (2016), indicate similar tendencies. In general, previous industrial revolutions have shown that the displacement effect may prevail in the near run. When markets and society have fully adjusted to big technological shocks, the productivity effect may kick in and have a long-term beneficial influence on employment. But how trustworthy is this method? According to McKinsey Global Institute specialists, AI is altering society at a rate 10 times quicker and on a scale 300 times larger than the industrial revolution of the late 18th and early 19th centuries, and is having nearly 3,000 times the effect (Dobbs, Manyika and Woetzel 2015).

Furthermore, continuous development of deep machine-learning algorithms that employ the function and complexity of the human brain as a design model is the main engine of technological progress in the AI era. The programming of intelligent robots has ramifications for the workforce.

Another method would be to analyse the likelihood of AI systems automating jobs and tasks in the next decades. In light of present and prospective technology advancements, the literature has focused on the feasibility of automating existing employment (Arnold et al. this volume). "Over an indefinite period of years, maybe a decade or two," Frey and Osborne (2013, 2017) estimated, "47 percent of US occupations will be automated" (Frey and Osborne 2017, 265). Bowles (2014) examined the European labour market using similar methods and found that 54 percent of EU occupations are at danger of becoming computerised. Other businesses and professions, for example, may expand to absorb the work that robots used to do. An

equilibrium approach would be necessary since technological feasibility does not always match to the equilibrium impact of automation on employment and wages. We must recognise, for example, that technological shocks are endogenous to corporate strategy and investments: Even if the predicted technical breakthroughs materialise, there is no assurance that businesses would choose to automate; the price of replacing workers with machines, as well as the amount of pay inflation in reaction to the danger, will determine this. This takes us to the third method of evaluating AI's labour market influence. The majority of the research that led to this equilibrium approach has one thing in common: they all focus on one automated technology, industrial robots, and its influence on employment. This is due to the availability of high-quality data on industrial robot penetration in important industries in major nations throughout the world. "An autonomously controlled, reprogrammable, multifunctional manipulator programmable in three or more dimensions, which may be fixed in situ or transportable for use in industrial automation applications," according to the definition of an industrial robot (International Federation of Robotics 2016).

Unlike our coffee machine or the elevator in our building, industrial robots are entirely self-contained machines that may be trained to do a variety of manual tasks such as welding, painting, assembling, material management, and packaging. For millennia, machines have rendered employment obsolete. Spinner jennies replaced weavers, elevator operators replaced buttons, and travel companies were supplanted by the Internet. Automation and artificial intelligence, in principle, should release humans from risky or monotonous work, allowing them to focus on more intellectually challenging jobs and increasing business production and employee compensation. Furthermore, technology was previously implemented in stages to enable staff to adjust to new tasks. With the support of severance money or unemployment benefits, those who have lost their jobs may be able to retrain and find work in a different profession. Businesses hurried to replace workers with machines or software, fearful of COVID-19 or risking surprise shutdown orders. There was no time to learn new skills. Companies who were concerned about their financial line instead let people go, enabling them to learn new skills on their own.

They just had a few choices. The United States has historically invested in education in response to technological advances. States extended access to public schools when mechanisation significantly interrupted agricultural labour in the late 1800s and early 1900s. Between 1944 and 1956, the GI Bill made education more accessible to veterans by sending 7.8 million soldiers to college. However, the US government has stopped funding in education since then, leaving workers to pick up the price. Furthermore, education in the United States still prioritises college for young workers above retraining. At 0.1 percent of GDP, the government spends less than half of what it spent 30 years ago on job transition assistance. According to Mark Muro, a senior analyst at the Brookings Institution, "the primary automation fear isn't so much a robot apocalypse." "It's business as usual for people who need retraining because they can't obtain it in a way that's accessible, efficient, well-informed, and data-driven."

#### DISCUSSION

In theory, automation and artificial intelligence should free people from dangerous or repetitive labour, enabling them to concentrate on more intellectually stimulating tasks, boosting firm productivity and employee wages. Furthermore, in the past, technology was adopted in phases to allow employees to acclimate to new responsibilities. Those who have lost their jobs may be able to retrain and find work in a new field with the help of severance pay or unemployment benefits. Fearful of COVID-19 or facing unexpected shutdown orders, businesses rushed to replace employees with robots or software. There was no time to pick up new abilities. Companies who were worried about their bottom line let employees leave instead, allowing them to find out how to develop new skills on their own. The government invests 0.1 percent of GDP on job transition assistance, which is less than half of what it spent 30 years ago. According to Mark Muro, a senior scholar at the Brookings Institution, "the fundamental automation challenge isn't so much a robot apocalypse." "It's business as usual for individuals who need retraining, and they can't receive it in a way that's accessible, efficient, well-informed, and data-driven."

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