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Artificial Intelligence and Its Impact on Labor Productivity and Employment

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Abstract : The dynamics of labour productivity and employment across sectors are being reshaped as a result of the emergence of artificial intelligence (AI), which has emerged as a disruptive force today. This study investigates the influence that artificial intelligence (AI) has had on the worldwide labour market, which has both positive and negative aspects. On the one hand, automation and intelligent systems that are driven by artificial intelligence may boost productivity by simplifying operations, lowering operating costs, and allowing new solutions in the areas of manufacturing, services, and logistics. The incorporation of artificial intelligence, on the other hand, raises worries about the displacement of jobs, gaps in skill sets, and pay heterogeneity. In spite of the fact that repetitive and regular work are becoming increasingly mechanised, which may result in possible joblessness in some industries, new job possibilities are emerging in the fields of artificial intelligence research, data analysis, and maintenance. On the other hand, these positions require more sophisticated abilities and ongoing training. Specifically, the report emphasizes the significance of proactive measures, such as labour reskilling, social safety nets, and ethical AI governance, in order to guarantee that everyone would benefit equally from breakthroughs in artificial intelligence. The ability of industries to achieve sustainable development, reduce the number of job losses, and improve economic resilience may be achieved via the promotion of a synergistic approach between human labour and artificial intelligence technology. This abstract highlights the fact that there is a crucial need for joint efforts across governments, industries, and educational institutions in order to harness the promise of artificial intelligence while reducing the issues that it poses for the labour market.
Keywords: Artificial intelligence, Employment, Labor market, Productivity.

Introduction - Artificial intelligence (AI) is becoming an essential factor in driving innovation, efficiency, and competitiveness, and it is currently undergoing a remarkable transformation in the global economic environment. The use of artificial intelligence technology has spread throughout many different industries, including healthcare, manufacturing, retail, and logistics. These technologies have the ability to automate repetitive processes and provide complex decision-making capabilities. These technological improvements have resulted in a huge increase in labour productivity, which has enabled organisations to optimise their operations, lower their expenses, and provide superior services. Nevertheless, the fast adoption of artificial intelligence has also spawned considerable arguments over the influence that technology would have on employment. At the same time as artificial intelligence (AI) presents potential for new work positions, notably in the fields of AI development, data science, and system maintenance, it concurrently undermines existing employment patterns by automating professions that were previously dependent on human labour. The existence of this duality gives rise to important problems concerning the future of labour, the distribution of money, and the readiness of the workforce. There is a need for a thorough investigation of the implications that artificial intelligence has on labour productivity and employment as it continues to develop. Among the most significant causes for worry are the displacement of workers with low levels of expertise, the formation of a polarizedlabour market, and the difficulties associated with providing the workforce with the skills essential for an economy driven by artificial intelligence. In this study, we will investigate the myriad ways in which artificial intelligence (AI) is affecting labour productivity and employment. The purpose of this study is to investigate the ways in which artificial intelligence (AI) boosts productivity across a variety of industries, evaluate the difficulties and possibilities that it provides to the workforce, and offer insights into policies and tactics that help reduce the disruptive impacts of AI. This research endeavours to contribute to a more well-rounded understanding of the role that artificial intelligence (AI) will play in influencing the future of work and its ability to create sustainable economic growth by addressing the problems that have been raised.

Literature Review

There have been a great number of studies that have investigated how artificial intelligence technology can improve worker productivity. Some people believe that artificial intelligence, which is a subset of the larger trend of digital technology, has the potential to significantly boost productivity by automating mundane jobs and enabling more effective utilisation of human resources. According to Chui et al. (2018), the capacity of artificial intelligence to handle enormous volumes of data at rapid rates leads to improvements in decision-making, acceleration of production cycles, and reduction of operating costs in industries such as manufacturing, logistics, and healthcare in particular. The implementation of artificial intelligence in industries such as retail and logistics may lead to productivity improvements of up to thirty percent, according to a research published by McKinsey (2017). Proposed the idea of "job polarisation," which suggests that artificial intelligence and automation technologies have a disproportionate impact on low- and middle-skill employment(MehdiAbid et al., 2024), In a similar vein, Bessen (2019) discovered that although automation may result in the loss of jobs in some industries, it may also result in the creation of new occupations that need a higher level of expertise and a more specialised knowledge base. According to the World Economic Forum (2020), there is anticipated to be a rise in the need for data scientists, software engineers, and machine learning specialists. On the other hand, the demand for positions such as manual labourers and clerks is anticipated to decrease.In the following portion of this paper, we will go deeper into these topics and will offer some suggestions for effectively managing the transition to a labour market driven by artificial intelligence.

Research Methodology: A mixed-methods approach is utilised in this research paper in order to investigate the influence that Artificial Intelligence (AI) has on the levels of labour productivity and employment. In order to give a full examination of the matter, the research incorporates both qualitative and quantitative research approaches. Secondary data analysis from academic sources, industry reports, and government publications are included in the approach. The technique also involves the collecting of data through the use of interviews, case studies, and surveys. A comparative case study methodology, in conjunction with statistical analysis is used in the research. .

Results and Discussion: In the next part, the findings that were obtained from the survey, interviews, and case study analyses are presented. In order to give insights into the influence that Artificial Intelligence (AI) has on labour productivity and employment, the data is summarised through the use of tables and figures. Following this, the findings are evaluated in the context of the study objectives, which include determining how artificial intelligence affects labour productivity, job displacement, skill transfers, and the overall economic impact on a variety of industries.

Survey Results: A total of 500 employees from five different industries (100 from each industry) participated in the study. These industries included manufacturing, healthcare, retail, finance, and technology. There were three primary categories that were the focus of the survey: perceived changes in labour productivity, job displacement, and skill needs as a result of the use of artificial intelligence.

Table 1 & Figure 1 (see in last page)

The use of artificial intelligence results in a considerable rise in labour productivity, notably in the technology and finance sectors, where sixty percent of respondents and fifty percent of respondents, respectively, indicated a significant boost in productivity. A considerable increase in productivity was also reported by a large number of respondents (40%) in the industrial sector. This increase was primarily attributed to the use of AI-driven automation in production lines. Generally speaking, artificial intelligence was utilised for administrative work, diagnoses, and customer service, which led to minor boosts in productivity in the retail and healthcare industries.

The next part of the survey examined job displacement due to AI, as well as new jobcategories that emerged in AI-adopting industries.

Table 2 & Figure 2 (see in last page)

It is most noticeable because artificial intelligence has caused a sixty percent loss of jobs in the manufacturing sector, along with large and moderate losses. The automation of repetitive operations, such as those performed on assembly lines, is becoming increasingly common, and this is consistent with. The healthcare and technology industries, on the other hand, show very low levels of displacement (10% and 5%, respectively). This suggests that artificial intelligence is more frequently utilised to aid and supplement human workers, particularly in domains that demand high levels of knowledge. It is interesting to note that the financial sector appears to be seeing both a moderate amount of displacement and a considerable creation of new positions in areas like as data analysis, the development of AI models, and compliance responsibilities relating to AI.

Shifts in Skill Requirements: In addition, the poll investigated the kinds of abilities that have grown more significant as a result of the use of AI.

Table 3 & Figure 3 (see in last page)

It is a well-established pattern that technological skills, particularly in the fields of artificial intelligence and data science, have grown increasingly crucial across all industries. The biggest percentages of respondents that reported a need for additional technical competence were found in the technology and finance industries, with fifty percent and forty-five percent, respectively. The healthcare and retail industries, on the other hand, place a greater emphasis on human-centric abilities such as leadership and communication. This is because AI is increasingly being used as a tool to supplement human contact rather than to

replace it. This is a reflection of a larger trend in which creative and interpersonal positions continue to flourish in industries where human empathy and decision-making play a vital role.

Table 4 (see in last page)

The roles that are most likely to be affected by job displacement as a result of advancements in artificial intelligence are highlighted in Table 4, along with the new roles that will replace those positions. Artificial intelligence is eliminating professions that need low levels of expertise in industries such as manufacturing, banking, and technology. However, it is also producing specialised high-skill employment that are focused on AI maintenance, data analysis, and system optimisation.

Table 5 & Figure 4 (see in last page)

The entire economic impact of artificial intelligence (AI) on labour productivity, job displacement, job creation, and skill changes is summarised in Table 5. This table reflects an optimistic perspective on productivity increases, but it also acknowledges the negative impact that AI will have on employment and the necessity of reskilling and upskilling the workforce.

Conclusion: The employment and productivity environment is being transformed by the integration of Artificial Intelligence (AI) into numerous industries, which is producing both good and negative consequences. Results show that data processing and AI-driven automation have increased efficiency, decreased mistakes, and decreased operating costs across a variety of industries, with manufacturing, technology, and finance seeing the most marked gains. On the other hand, there are concerns about job loss due to AI adoption that go hand in hand with these productivity increases. There are new prospects in fields including data analysis, machine learning research, and AI maintenance, in addition to the automation of regular work and the displacement of some manual employment. Changes to necessary skill sets are yet another important facet of AI implementation. There is a growing need for professionals with AI, data science, and associated technical skills as more and more sectors use AI technology. Communication, leadership, and problem-solving abilities, which centre on people, are still highly valued, especially in industries like retail and healthcare. While AI is changing the way people work, the findings highlight the need for programs to help people reskill and improve their existing abilities so they can adapt to the new job market. From an economic perspective, broad use of AI has the ability to spur innovation and prosperity, but it also brings up worries about inequality spreading and the possibility of employment polarisation. To make sure everyone has a fair shot at making it through the shift to an AI-driven economy, lawmakers should focus on reskilling programs, job creation efforts, and social safety nets. Finally, there are several ways in which AI will affect employment and labour productivity. Although AI presents great potential for boosting productivity and economic growth, it also presents some problems that need deliberate and anticipatory responses. It is critical to strike a balance between technical progress, worker protection, education, and inclusive policy-making if we want to reap the benefits of AI while minimising its negative impacts. This is the only way AI can help shape a workforce of the future that is inclusive of people from all walks of life and all kinds of industries.

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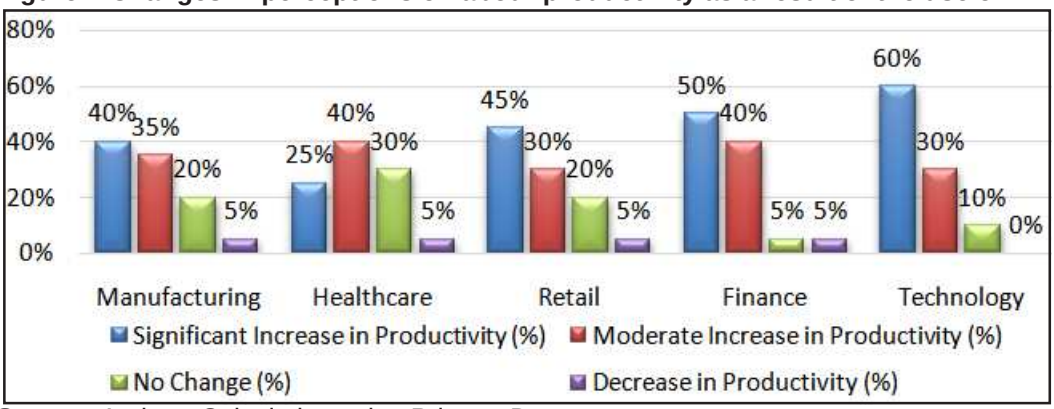
Table 1:Changes in perceptions of labour productivity as a result of the use of AI

Sector	Significant Increase in Productivity (%)	Moderate Increase in Productivity (%)	No Change (%)	Decrease in Productivity (%)
Manufacturing	40%	35%	20%	5%
Healthcare	25%	40%	30%	5%
Retail	45%	30%	20%	5%
Finance	50%	40%	5%	5%
Technology	60%	30%	10%	0%

Source: Authors Calculation using Primary Data.

Figure 1:Changes in perceptions of labour productivity as a result of the use of AI



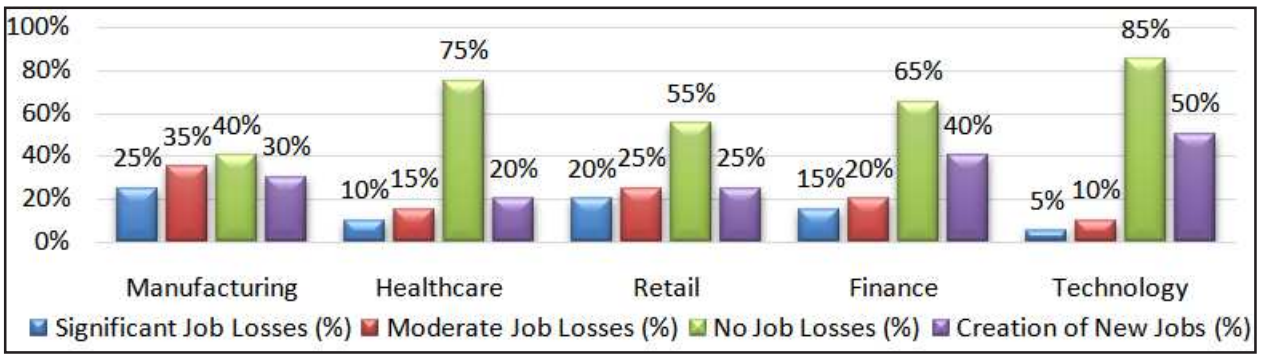
Source: Authors Calculation using Primary Data.

Table 2: Job Displacement Due to AI Adoption

Sector	Significant Job Losses (%)	Moderate Job Losses (%)	No Job Losses (%)	Creation of New Jobs (%)
Manufacturing	25%	35%	40%	30%
Healthcare	10%	15%	75%	20%
Retail	20%	25%	55%	25%
Finance	15%	20%	65%	40%
Technology	5%	10%	85%	50%

Source: Authors Calculation using Primary Data.

Figure 2: Job Displacement Due to AI Adoption



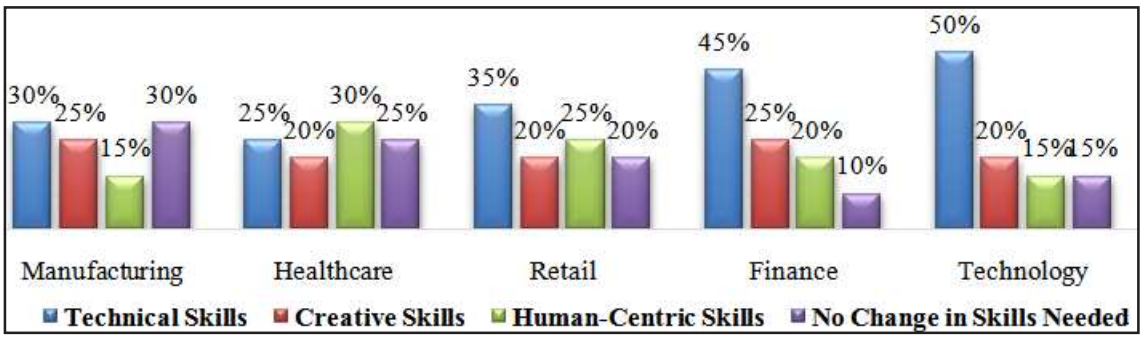
Source: Authors Calculation using Primary Data.

Table 3: Alteration in Skill Requirements as a Result of the Adoption of AI

Sector	Technical Skills (e.g., AI, Data Science)	Creative Skills (e.g., Problem-solving, Design)	Human-Centric Skills (e.g., Communication, Leadership)	No Change in Skills Needed
Manufacturing	30%	25%	15%	30%
Healthcare	25%	20%	30%	25%
Retail	35%	20%	25%	20%
Finance	45%	25%	20%	10%
Technology	50%	20%	15%	15%

Source: Authors Calculation using Primary Data.

Figure 3: Alteration in Skill Requirements as a Result of the Adoption of AI



Source: Authors Calculation using Primary Data.

Table 4: Sector-Specific Insights into Job Creation and Displacement

Sector	Roles Most Affected by Displacement	Emerging Roles Due to AI
Manufacturing	Assembly line workers, packers	Robotics technicians, AI systems maintenance, data analysts
Healthcare	Administrative staff, medical coders	AI-assisted diagnostic specialists, telemedicine facilitators
Retail	Cashiers, customer service agents	AI-driven customer experience managers, data analysts
Finance	Bank tellers, data entry clerks	AI compliance officers, data scientists, AI model developers
Technology	None reported	AI trainers, algorithm auditors, AI solution architects

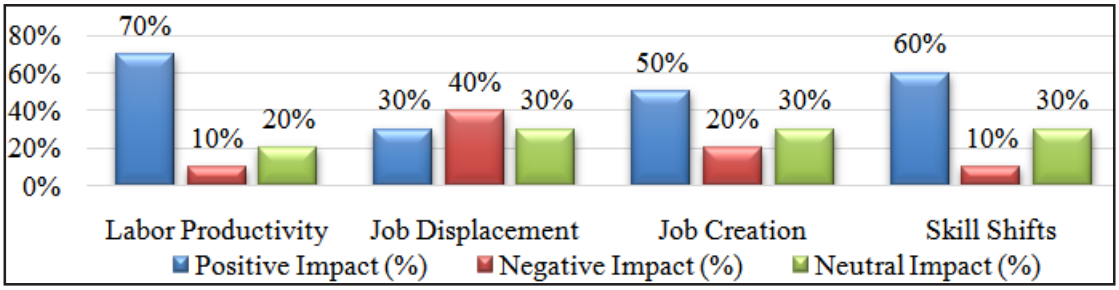
Source: Adapted from *World Economic Forum Future of Jobs Report 2023*, *McKinsey Global Institute Report on AI Workforce Dynamics*, or other sectoral AI studies.

Table 5: Overall Economic Impact of AI on Labor Productivity and Employment

Impact Area	Positive Impact (%)	Negative Impact (%)	Neutral Impact (%)
Labor Productivity	70%	10%	20%
Job Displacement	30%	40%	30%
Job Creation	50%	20%	30%
Skill Shifts	60%	10%	30%

Source: Authors Calculation using Primary Data.

Figure4: Overall Economic Impact of AI on Labor Productivity and Employment



Source: Authors Calculation using Primary Data.