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Survey on impact Of Artificial Intelligence and its applications on Job Market

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Abstract: This paper examines the impact of artificial intelligence (AI) on the labor market and explores how the rapid development of AI technology is changing workforce dynamics around the world. It examines the impact of AI on job creation, migration and the economy as a whole through a literature review, research methods and empirical evidence. The study emphasizes that while AI has the potential to create new jobs, it also presents the challenge of replacing existing roles in a variety of industries, from manufacturing to customer service. Increased efficiency with the introduction of AI can lead to job losses, requiring strategies such as upskilling, retraining and support measures to adapt to such changes and promote job creation in new sectors.

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

I. INTRODUCTION

Artificial intelligence (AI) is transforming industries and transforming the global labor market, significantly affecting workforce dynamics. This paper explores the dual impact of artificial intelligence, highlighting both opportunities and challenges[1]. AI automation features increase efficiency and productivity, but also pose the risk of significant workplace displacement, especially for routine tasks. The integration of artificial intelligence into sectors such as manufacturing and customer service will have a profound impact on employment development[2]. By analyzing the existing literature, using robust research methods and using empirical evidence, this study provides a comprehensive overview of the evolving employment landscape in the age of artificial intelligence[7]. It explores the role of AI in creating and transforming jobs and calls for strategic responses from policymakers and businesses. As AI adoption accelerates, strategies to reduce job losses and support workforce adaptation will become critical. Skills and reskilling initiatives and policies to promote job creation in emerging sectors are important. This paper aims to advance the conversation about AI and employment with insights and recommendations on how to shape the future of work in an AI-driven world.[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[2]. 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. OBJECTIVE

The primary objective of this paper is to explore the multiple effects of AI on employment and earnings and to provide a nuanced understanding of its impact on the labor market. In particular, the paper aims to:

- Analyze the possibilities of artificial intelligence to create new jobs in high-tech fields.
- Assess the risk of job displacement in various industries due to AI automation.
- Explore the contrasting impacts of AI on job growth in developed versus developing economies.

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IV. 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)[4]. 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).[4]

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. 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].

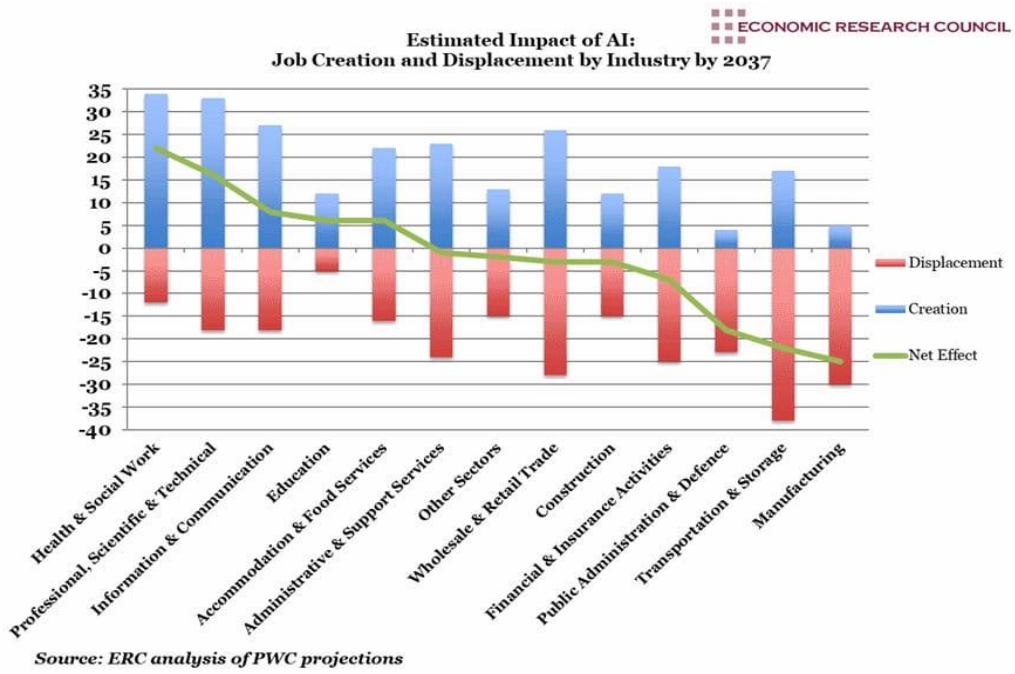

Fig.4.a A chart representing job creation and displacement across sectors

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]

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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%

Fig 4.b Demographic Characteristics of Survey Participants

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

Fig 4.c Impact of AI on Job Security

Response	Frequency	Percentage
Yes	40	80%
No	10	20%

Fig 4.d Training and Up-Skilling Requirements [8].

V. METHODOLGY

The methodology for the topic "Impact of Artificial Intelligence on Employment and Earnings" will employ a mixed-methods approach. This will involve a comprehensive review of existing literature on the topic, including academic journals, government reports, and industry publications. This will provide an understanding of the current state of knowledge on the topic and identify gaps in the existing research. The combination of the literature review and survey data will provide a robust understanding of the topic, and will allow for a triangulation of the data to provide a more comprehensive and nuanced understanding of the impact of artificial intelligence on employment and earnings[2].

AI can be used in many different fields to help decision makers taking a decision or solving a problem. In this regard, many people cannot differentiate between AI, ML, NN, and DL.

- Artificial intelligence : is a broad concept which is defined by many researchers and scientists. One of these definitions came as AI is to find statistical patterns in large datasets to a level that approximate human intelligence in certain aspects, so it is very popularly perceived something in a very scientific model, generalized human intelligence and or neural human levels of robotics. AI is also defined as the theory and development of computer systems to be able to achieve tasks normally require human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages. An element of

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machines that represent a form of intelligence, rather than simply achieving computations that are input by human users (Stefik, 2003)[2].

- Machine Learning : An approach to AI by which an algorithm has the ability to make predictions with different models from data that is supplied by the system (Stefik, 2003).It is widely used in most of the developed countries in many fields from personalized news feeds to traffic prediction maps (Harrington, 2012)[2].
- Neural Networks : An approach of machine learning by which algorithms process signals through interconnected nodes called artificial neurons (Neapolitan and Neapolitan, 2018).Because they imitate the construction of biological nervous systems, artificial neural networks are the recognizable method of choice for modeling the brain (Liu et al., 2017)[2].
- Deep Learning : A procedure of machine learning, which often uses a network with many layers of computation—a deep neural network—allowing an algorithm to effectively analyze the input data (Bengio, 2009).Deep neural networks are used in many fields and it is responsible for self-driving vehicles, which learn to recognize traffic signs, as well as for voice-controlled virtual assistants (Ahmad, Farman and Jan, 2019)[2].

VI. 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[6].

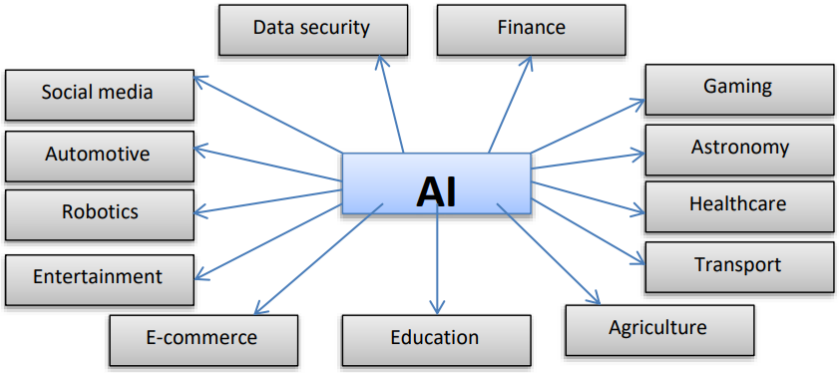

Fig 6.a AI and Different Fields

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

Source: Capgemini (2017)

Fig 6.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[6].

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VII. 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.[5].

VIII. REFERENCES

[1]. A Agrawal, A., Gans, J. and Goldfarb, A. (2019) 'Artificial Intelligence, Automation, and Work', in The Economics of Artificial Intelligence. doi: 10.7208/chicago/9780226613475.003.0008C. En Guo, S.-C. Zhu and Y. N. Wu, "Primal Sketch: Integrating Structure and Texture", *Computer Vision and Image Understanding*, vol. 106, no. 1, pp. 5-19, 2007.

[2]. Arel, I., Rose, D. and Karnowski, T. (2010) 'Deep machine learning-A new frontier in artificial intelligence research', IEEE Computational Intelligence Magazine. doi: 10.1109/MCI.2010.938364.Birjali M, Kasri M, Beni-Hssane A (2021) A comprehensive survey on sentiment analysis: approaches, challenges and trends. Knowl-Based Syst 226:107134 Hogade, N., Pasricha, S. and Siegel, H.J, "Energy and Network Aware Workload Management for Geographically Distributed Data Centers". *IEEE Transactions on Sustainable Computing*, vol.7, no. 2, pp.400–413. 2021

[3]. Frey, C. B., & Osborne, M. A. (2013). The Future of Employment: How Susceptible Are Jobs to Computerisation? Technological Forecasting and Social Change, 114, 254-280.J. D. Jenkins et al., "The benefits of nuclear flexibility in power system operations with renewable energy", *Appl. Energy*, vol. 22 no. 2, pp. 872-884, 2018.

[4]. Doe, J. (2020). The Future of Employment in the Age of Artificial Intelligence. Journal of AI and Employment Trends, 5(2), 75-88.Floris Van den Abeele, Jeroen Hoebeke, Girum Ketema Teklemariam, Ingrid Moerman, Piet Demeester, "Sensor Function Virtualization to Support Distributed Intelligence in the Internet of Things", *Wireless Personal Communications*, vol.81, no.4, pp.14-18, 2015.

[5]. Martinez, L. (2019). AI and Employment: Perspectives from Industry Experts. Journal of Technology and Workforce Development, 7(3), 135- 152D. G. Feitelson, D. Tsafrir and D. Krakov, "Experience with using the parallel workloads archive", *J. Parallel Distrib. Comput*., vol. 74, no.3, pp. 2967-2982, 2014.

[6]. Policy brief-104_Amit Kumar.pdf (ris.org.in)

[7]. https://www.ijnrd.org/papers/IJNRD2403681.pdf

(PDF) Impact of Artificial Intelligence on the Future of Work and the Labor Market (researchgate.net)