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A Study on the Dynamics of Employment : An Evolutionary Framework in the Era of AI

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Abstract: *The rise of Artificial Intelligence (AI) and automation has led to concerns about job replacement in various industries. This study explores how AI is changing the job market, identifying the sectors most affected and how employees perceive these changes. It also examines whether AI can fully replace human workers or if humans will continue to play an important role. Using quantitative analysis and hypothesis testing, the research investigates the impact of AI on jobs and workforce adaptation. The findings show that while AI is automating repetitive tasks, it cannot completely replace human skills like decision-making and creativity. The study highlights the importance of reskilling and upskilling to help workers adapt to AI-driven changes. The paper concludes that AI will reshape jobs rather than eliminate them entirely, emphasizing the need for human-AI collaboration in the future..*

Keywords: Artificial Intelligence

I. INTRODUCTION

The rapid advancement of artificial intelligence (AI) and automation is transforming industries, reshaping job roles, and redefining the global workforce. While technological innovations have historically driven economic growth and improved productivity, they have also led to concerns about job displacement. As machines and AI-powered systems take over tasks traditionally performed by humans, the nature of employment is undergoing significant change.

This study aims to evaluate the impact of AI and automation on job displacement, exploring which industries and job sectors are most vulnerable, the socio-economic consequences of workforce disruptions, and potential strategies to mitigate negative effects. By examining historical precedents, current trends, and future projections, this research seeks to provide a comprehensive understanding of how AI-driven automation is influencing employment patterns. Additionally, it will address the role of reskilling, government policies, and corporate strategies in ensuring a balanced transition toward an AI-integrated workforce.

As society navigates this technological shift, it is crucial to assess both the challenges and opportunities presented by AI and automation. This study will contribute to ongoing discussions on how best to adapt to these changes while minimizing economic and social inequalities.

II. STATEMENT OF THE PROBLEM

AI and automation are reshaping industries, raising concerns about job displacement in routine roles. This study examines which sectors are most affected, how workers are adapting, and what strategies can ensure a balanced transition in an AI-driven economy.

III. OBJECTIVES OF THE STUDY

- To analyze the impact of AI on job displacement.
- To explore the skill and role that will remain relevant in an AI-drive job market.
- To assess the skill gap created by AI adoption.

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IV. REVIEW OF LITERATURE

Cirillo, Evangelista, Guarascio, & Sostero (2021) - According to research, technological advancements are disrupting labour markets, leading to a growing polarization of employment opportunities into low-skilled and high-skilled positions.

Lloyd & Payne, (2019) - The rapid growth of new technologies raises concerns about the potential displacement of high-skill, high-wage jobs, potentially putting previously secure positions at risk.

Arntz, Gregory, & Zierahn, 2017; Frey & Osborne, (2017) -Studies predict significant job losses in automation-prone roles, influencing on-going discussions on the impact of technological advancements on the labour market.

Mokyr, Vickers, & Ziebarth, (2015) - Technological advancements have long been viewed as a threat to human labour, as seen during the first Industrial Revolution when the introduction of power looms and mechanical knitting frames led to the Luddite movement, which opposed this shift.

V. RESEARCH METHODOLOGY

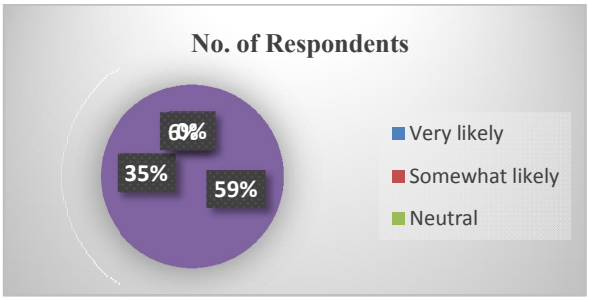
This study uses a quantitative approach, collecting primary data through a survey questionnaire. Responses were gathered using convenience sampling and analyzed with statistical tools to identify trends in AI-driven job displacement and workforce adaptation. The sample size for the study is 50 respondents.

VI. DATA ANALYSIS AND INTERPRETATION

The research survey consists of 50 respondents and the method used for data collection is structured questionnaire method. The questionnaire consists of 20 questions, divided into two sections. The first 10 questions focus on demographic details such as age, gender, educational background, employment status, and the industry of work. These demographic questions help categorize the respondents and understand their profiles. The remaining 10 questions are subject-related, addressing key themes like AI's impact on job displacement and respondents' perceptions of AI in the workforce. From these, we selected the most relevant questions for analysis, aligning with the research objectives and hypotheses. The analysis of these key subject-related questions reveals patterns and insights crucial to understanding the role of AI and automation in shaping the future of employment. This section provides a concise overview of the findings, focusing on the most significant trends from subject-related responses.

Very likely	Somewhat likely	Neutral
59%	35%	6%

6.1.In your opinion how likely is it that AI and automation will lead to job displacement in yourindustry within the next 5 years?



Interpretation: It is observed that 59% respondents are of the opinion that it is very likely that AI will lead to job displacement in their industry while 35% think that it is somewhat likely and 6% respondents are neutral.

Banning AI technologies	Reskilling and upskilling working	Reducing working salaries
23%	77%	0%

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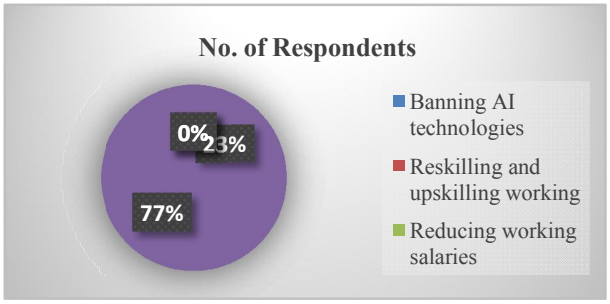
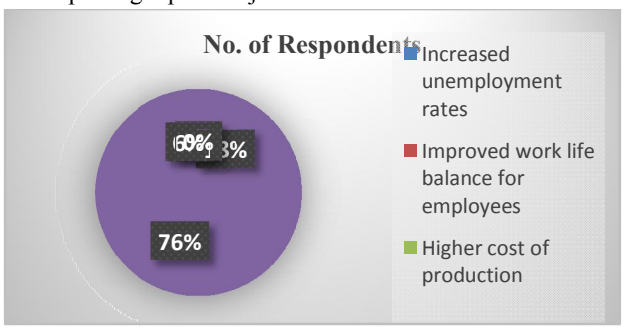
6.2.What is a possible solution to AI-induced job displacement?



Interpretation: It is observed that 23% and the rest 77% of the respondents agree that banning AI technologies and reskilling and upskilling working respectively is a possible solution to AI induced job displacement.

Increased unemployment rates	Improved work life balance for employees	Higher cost of production
18%	76%	6%

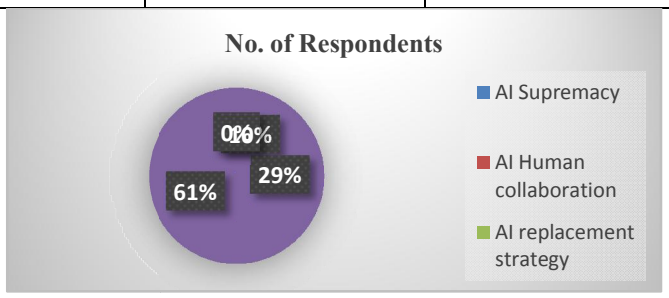
6.3.What is a major benefit of AI replacing repetitive jobs?



Interpretation: It is observed that 76% and 18% of the respondents agree that increased unemployment rates and improved work life balance for employee respectively are the major benefits of AI replacing repetitive jobs, and the remaining 6% of the respondents agree in higher cost of production.

6.4.What term is used to describe AI working alongside humans instead of replacing them?

AI supremacy	AI human collaboration	AI replacement strategy
29%	61%	10%



Interpretation: It is observed that 61% and 29% of the respondents agree AI supremacy and AI human collaboration respectively is used to describe AI working alongside humans instead of replacing them and remaining 10% of the respondents agree in AI replacement strategy.

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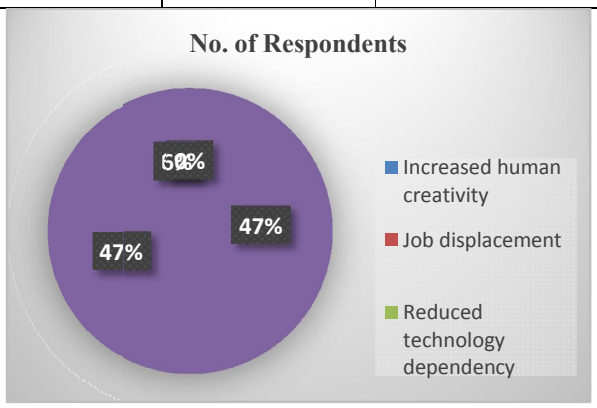
6.5.Which of the following is a major concern regarding AI in the workforce?

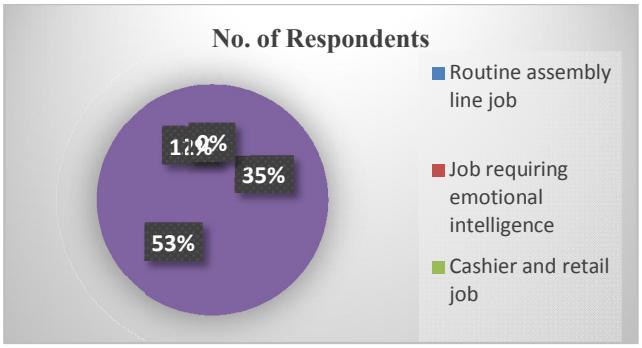
Increased human creativity	Job displacement	Reduced technology dependency
47%	47%	6%



Interpretation: It is observed that 47% and 6% of the respondents agree that increased human creativity and reduced technology dependency respectively is a major concern regarding AI in the workforce and the remaining 47% of the respondents agree in the job displacement.

Routine assembly line job	Job requiring emotional intelligence, like therapists	Cashier and retail job
35%	53%	12%

6.6.Which type of jobs are least likely to be replaced by AI in the near future?



Interpretation: It is observed that 35% of the respondents agree that routine assembly line job is at low risk, 12% respondents agree cashier and retail jobs are at low risk and the remaining 53% of the respondents agree that jobs which are related with emotional intelligence and therapist jobs are at low risk because AI cannot connect with human emotionally.

VII. HYPOTHESIS TESTING

Hypothesis testing using chi square distribution tool.

Hypothesis:

H0: AI will not entirely replace humans in the near future, as its capabilities are limited, and humans will continue to pay a significant role alongside AI in various domain.

H1: AI will entirely replace humans in the near future, as its capabilities are limited, and humans will continue to pay a significant role alongside AI in various domain.

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Table 1: Observed Value (0)

Job / Risk	Routine assembly line job	Job requiring emotional intelligence, like therapists	Cashier and retail job	Total
Yes	6	8	5	19
No	3	1	4	8
Maybe	1	1	2	4
Total	10	10	11	31

Table 2: Expected Value (E)

Job / Risk	Routine assembly line job	Job requiring emotional intelligence, like therapists	Cashier and retail job	Total
Yes	6.1	6.1	6.74	18.94
No	2.6	2.6	2.34	7.54
Maybe	1.29	1.29	1.42	4
Total	9.99	9.99	10.5	30.48

Expected value=upper total*lower total/grand total

Table 3: Chi-Square Calculation

	O	E	(O-E)	$(O-E)^2$	$(O-E)^{2/E}$
1	6	6.1	-0.1	0.01	0.001
2	8	6.1	1.9	3.61	0.59
3	5	6.74	-1.74	3.03	0.45
4	3	2.6	0.4	0.16	0.06
5	1	2.6	-1.6	2.56	0.98
6	4	2.34	1.66	2.75	1.18
7	1	1.29	-0.29	0.08	0.006
8	1	1.29	-0.29	0.08	0.006
9	2	1.42	0.58	0.34	0.24
Calculated Value					3.507

Degree of Freedom (DoF)= (3-1) *(3-1) = 4. At 0.05 significance level, the critical value for 4 DoF= 9.488.Calculated value is lower than the critical value. Hence, we fail to reject null hypothesis that is, Null hypothesis isaccepted.

VIII. FINDINGS

- 53% of the respondents are concerned about the possibility of losing job due to AI and automation.
- 53% of the respondents agreed that data entry and customer service job roles are most at risk due to AI.
- 61% of the respondents used to describe AI human collaboration AI working alongside humans instead of replacing them.
- 53% of the respondents agreedthat jobsthat require emotional intelligence, like therapists' are least likely to be replaced by AI in the near future.
- 77% of the respondents agreed reskilling and upskilling workers is a possible solution to AI-induced job displacement.

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IX. CONCLUSION

The study highlights the significant impact of AI and automation on job displacement, emphasizing that while certain repetitive and routine jobs are at high risk, new opportunities in AI-related fields and human-centric roles are emerging. The extent of displacement varies across industries, with manufacturing, customer service, and transportation facing the most disruption. However, upskilling, reskilling, and proactive workforce policies can mitigate negative effects and enable a smoother transition into an AI-driven economy. Overall, rather than solely eliminating jobs, AI and automation are reshaping the nature of work, demanding adaptability and continuous learning from the workforce.

X. SUGGESTIONS

To effectively evaluate job displacement in the age of AI and automation, focus on identifying high-risk industries, analyzing workforce adaptation strategies, and assessing policy responses. Use a combination of labor market data, expert interviews, and case studies to provide a balanced perspective. Emphasize reskilling programs, emerging job opportunities, and the role of AI in augmenting rather than replacing human labour.

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