



The Double-edged Sword of Artificial Intelligence Disrupting the Traditional Job Market: Job Disappearance and New Career Creation

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Abstract. The global job market is being fundamentally transformed by rapidly developing Artificial Intelligence technology, which results in market shocks as it generates fresh employment possibilities. This research analyzes two simultaneous effects of AI technology on conventional workplace employment by demonstrating both technological occupation abolishment and emerging employment types. Drawing on a model developed through literature review and case studies in finance, manufacturing, and healthcare, this paper conducts an assessment of job vulnerability to AI-induced impacts. AI tends to eliminate jobs that require low to medium skill levels and involve repetitive tasks, while simultaneously creating innovative roles that emphasize human interaction and creativity. The impact of these changes varies across social groups and geographic regions. The paper establishes policy recommendations along with talent development methods to resolve AI-era employment problems by promoting educational adaptability and inclusive strategies for broad technology benefit distribution.

Keywords: Artificial Intelligence, Employment Impact, Job Market

1 Introduction

The World Economic Forum report shows that by 2025, AI will lead to the disappearance of 85 million jobs while creating 97 million new jobs [1]. This change has triggered widespread concern and discussion in all walks of life. Existing research mostly focuses on the single aspect of AI's impact on employment, either emphasizing that it will replace jobs (e.g., automation replacing assembly line workers and clerical workers) or that it will create new jobs (e.g., AI specialists and data analysts), with a lack of systematic analysis, particularly regarding how different industries and demographic groups are responding to these changes. This study aims to address this gap through three primary objectives. First, to identify the types and characteristics of jobs that are vulnerable to replacement by AI; Second, to analyze the changes in skill demand and new job opportunities brought about by AI; and Third, to assess the fairness challenges faced by different groups of people in the context of this change. Through a combination of literature review and case studies in the finance, manufacturing, and healthcare

industries, this research provides a more holistic understanding of AI's impact on the employment landscape. The findings offer valuable insights for policymakers and stakeholders involved in workforce development and labor market planning.

2 Literature Review and Theoretical Framework

2.1 Creative Destruction Theory and Technological Change

Historically, new technologies have often brought about "creative destruction." Economist Joseph Schumpeter introduced this idea through his 1942 book *Capitalism, Socialism and Democracy* to define it as "a whirlwind of constant renewal of economic structures" that destroys old structures to build new ones. The economic development driven by capitalism depends fundamentally on this dynamic process explained by Schumpeter since its core function is the creation of new structure while eliminating old ones. "According to Acemoglu et al., AI-exposed establishments adopt AI while simultaneously reducing hiring in non-AI positions and changing the skill requirements of remaining postings, though aggregate effects on employment remain limited" [2].

Although mechanization initially provoked resistance from workers, over time it led to net job growth. Statistics from the past demonstrate this statement effectively. Labor employment in the textile industry increased fourfold during the first industrial revolution even though mechanical looms reduced weaving labor by 98% since lower cloth prices expanded market demand. Computer technologies and Internet dissemination throughout the twentieth century brought about unemployment worries which led to the creation of more than 15 million IT positions in the United States. While technological transitions typically lead to short-term job losses, historical evidence suggests that these are offset in the long term by employment gains in new sectors. Nonetheless, the temporary disruption to livelihoods highlights the necessity of proactive policy responses to mitigate adverse impacts during transitional periods.

2.2 The Negative Impact of Artificial Intelligence on Employment

Regarding the negative impact of artificial intelligence on employment, Frey and Osborne's study estimated that about 47% of jobs in the United States are at high risk [3]. By analyzing the likelihood of automation in 702 occupations, they found that jobs in areas such as sales, transportation, and office support are at the highest risk, while jobs requiring higher social skills, such as healthcare, education, and management, are at lower risk. In contrast, the Organisation for Economic Co-operation and Development (OECD), using a more nuanced task analysis approach, concluded that only 9% of jobs in OECD countries are high-risk but that the content of many jobs will change significantly [4]. This difference stems largely from differences in research methodology: while Frey and Osborne use the overall occupation as the unit of analysis, OECD uses specific job tasks as the unit of analysis. The variation between the studies stems from using complete occupations as analytical units since Frey and Osborne make the assumption that theoretical automation threats affect all jobs in the same field. OECD examines individual work tasks across jobs instead of occupational categories since the

experts understand AI systems remain unable to replace adaptable social or creative abilities demanded by particular job responsibilities. The methodology uses individual tasks to create a comprehensive and realistic evaluation of risk caused by automation. The McKinsey report, on the other hand, predicts that by 2030, up to 800 million people worldwide may need to switch jobs due to automation [5]. The report highlights that the impact of automation varies significantly across countries and regions, with developed countries and China expected to face greater pressure to replace jobs.

2.3 Positive Role of Artificial Intelligence in Job Creation

While artificial intelligence poses significant risks to traditional forms of employment, it simultaneously generates new types of jobs and transforms existing roles. Autor's research shows that, historically, new technologies have always created more jobs than they have eliminated [6]. Using ATMs as an example, he points out that the number of bank tellers increased instead after the popularization of ATMs, as the tellers' job content shifted from simple cash handling to sales and customer relationship management. Employment expanded rapidly within sectors that adopted computer technology as an integral part of their operations according to Besen's findings which utilized industry employment data from 1980 to 2013 [7]. The research conducted an empirical analysis to evaluate employment modifications between sectors that utilized computers at divergent levels. After the introduction of spreadsheet software the employment numbers for accountants and auditors rose by 60% instead of decreasing. This paradox can be explained by the productivity-enhancing effects of new technologies, which reduce operational costs, stimulate consumer demand, and subsequently generate additional labor opportunities.

3 Industry Case Studies

3.1 The Financial Industry Case: From Tellers to Algorithmic Trading

The banking industry demonstrates the dual effects of technology on employment through ATMs, which led to an increase rather than a decrease in bank tellers despite their introduction during the 1980s and reaching 550,000 employees in 2010 [6]. Many banks were able to open multiple new outlets after their costs to establish ATMs declined. Stitches between these changes include tellers transitioning their skills from basic cash work to product sales alongside client service duties.

Modern AI technology presents the possibility to shift this ongoing employment pattern. Modern AI technology surpasses ATMs since it already executes sophisticated financial processes, while ATMs perform only minimum cash transaction duties. "Studies indicate that financial services face significant disruption from AI, with firms increasingly seeking professionals with AI and data analytics skills rather than traditional banking roles"[8]. This trend is accelerating, and it is estimated that the majority of banking positions could be impacted by AI-driven automation by 2030. Senior employees, in positions such as credit review departments, risk assessment and compliance

checks face the highest likelihood of being replaced by technology. Despite these challenges, financial technology has also given rise to new employment opportunities. While automation displaces traditional roles, it simultaneously creates new positions such as algorithmic trading engineers, financial data analysts, and blockchain developers. A recent 2018 hiring record from JPMorgan Chase indicates technological roles represent over one-third of the bank's newest hiring positions focused on artificial intelligence and cloud computing along with cybersecurity expertise.

3.2 The Case of Manufacturing: From Assembly Lines to Smart Factories

The manufacturing industry operated with automation for many decades until artificial intelligence drove these improvements even further. "Recent research shows that automation adoption in manufacturing varies by demographic factors, with countries experiencing rapid aging adopting more robots, especially in industries relying on middle-aged workers" [9]. Factory assembly lines maintain the highest exposure to industrial automation through tasks such as manufacturing assembly and, packaging and material handling operations. Foxconn launched its 'Million Robots Program' in 2011 as part of a plan to use robots as replacements for assembly line employees.

However, smart factories are also generating new roles that require advanced skills. "The OECD Employment Outlook 2023 indicates that AI adoption varies significantly across sectors, with establishments increasingly changing their hiring patterns and skill requirements as they integrate AI technologies"[1]. General Electric's "lighthouse factory" utilizes AI and IoT technologies to boost productivity by 25 percent while establishing positions that need workers with combined skill sets. Moreover, the transformation of manufacturing is fueling job growth in adjacent service industries. The implementation of Germany's "Industry 4.0" strategy has created substantial demand growth for services in system integration, remote monitoring and maintenance, and personalized demand consulting services related to enterprises in the market.

3.3 The Healthcare Industry: the Two-sided Impact of Ai-assisted Diagnosis

The healthcare industry experiences slightly different conditions compared to others. "Deep learning has demonstrated expert-level performance in medical image interpretation across multiple specialties, from ophthalmology to radiology and pathology"[10]. However, research shows doctors receive more help from AI than replacements in medical industries[11]. The healthcare industry needs expert medical knowledge, emotional empathy, and ethical reasoning skills, which AI systems currently lack in adequate replacement. According to McKinsey's analysis healthcare stands as one of the fields which will experience job growth instead of a decline throughout 2030[4]. As populations age and healthcare needs increase, the demand for human-centered care will likely outpace any reductions in staff due to automation. Roles in medical administration, patient education, and mental health counseling are particularly poised for expansion. Additionally, AI technology has introduced various medical occupations into this field. AI

has generated three distinct medical roles which now exist as clinical decision support system experts alongside medical data scientists and AI medical ethics consultants. The implementation of the Watson assisted system led Peking Union Medical College Hospital to establish an AI medical team for training, evaluation and patient contact duties.

4 New Career Opportunities and Challenges Spawned by Artificial Intelligence

Artificial intelligence serves as a basis for three distinct job roles that combine technical expertise with social abilities, namely AI ethics specialists alongside machine learning engineers as well as conversation designers. A LinkedIn analysis revealed that AI specialist job demand expanded by 74% from 2015 until 2019, while Deming's research indicates that these positions require the integration of social skills along with technological capabilities [12, 13]. Artificial intelligence positions the creation of many new jobs through a combination of exclusive human abilities that include empathy creativity, and divergent thinking, according to Lee's research findings [14]. The rise of AI has made "digital transformation consultant," "user experience designer," and similar roles crucial to modern business operations. Fundamental educational changes must be implemented to solve the employment challenges caused by AI. "The digital transformation requires significant reskilling and upskilling efforts, with workers needing to develop both technical skills and transversal skills such as critical thinking and creativity." [15]. The OECD suggests that educational policies should transition from skill-specific instruction towards adapting students for lifelong learning[5]. Organizations must take action to adapt their operations based on the alterations AI introduces to their industry. McKinsey research reveals that 375 million workers worldwide (14% of the total workforce) will potentially need occupational change by 2030 [4]. Organizations need to implement three key strategies, including skill development programs within the company and a combination of human and computer work methods to adapt. A policy structure for inclusive AI development should be implemented by governments while they should enhance their social security programs, increase financial access for all sectors, and create active labor market programs.

5 Conclusion

Artificial intelligence implements "creative destruction" as its primary effect on employment rates. AI will eliminate a certain number of jobs in specific industries and occupations over the short term, whereas professionals entering AI-created careers will outnumber those displaced by technology in the long run. Labor market transformation faces more difficulties from structural mismatches than aggregate imbalances combined with transformational adjustments, according to research studies. A flexible and adaptive labor market system can be built by the combined actions of governments and enterprises along with educational institutions and individual workers to resolve AI employment issues. This study has several restrictions, including the time delay in data

collection, the lack of industry diversity in case selection difficulties in measuring future occupations, and the complexities in forecasting changes to sophisticated systems. Research-based research on AI effects must identify the unique population and regional differences, investigate AI and blockchain and metaverse effects, and consider employment infrastructure across international value chains and AI workforce dynamics in present times.

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