

The Dual Impact of AI on Routine-Task Jobs: A Multi-stakeholder Framework for Employment Transformation

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Abstract. This paper meticulously conducts a comprehensive investigation into the impact of artificial intelligence (AI) on routine - task-intensive occupations. In the current landscape, with AI's swift and pervasive penetration across numerous industries, this topic has become of utmost importance. Case study analysis vividly shows that AI is actively replacing a large number of traditional low-skilled jobs. Meanwhile, it is also spawning new complementary and service-oriented roles, presenting both challenges and opportunities. Through a multi-dimensional and in-depth assessment, the analysis clearly uncovers positive aspects, such as new job creation, as well as negative impacts like job displacement and worsened inequality. To effectively address these issues, it is proposed that governments should vigorously promote skills upgrading and re-employment initiatives. Enterprises need to carefully balance AI adoption with safeguarding employee rights. And workers themselves should proactively enhance their capabilities. Overall, this research offers valuable and practical guidance for stakeholders, making a notable contribution to fostering a more inclusive and sustainable approach to AI-driven labor market transformations, thereby holding substantial practical and social value.

Keywords: Artificial Intelligence, Routine-Task-Intensive Occupations, Employment, Labor Force Structure, Skills Upgrading

1. Introduction

1.1. Research Background

With the rapid development of science and technology, artificial intelligence is gradually penetrating various industries, and its impact on routine-task-intensive occupations is particularly significant. Data from Challenger, Gray & Christmas Inc. indicates that AI has already started replacing jobs. In May 2023, it was accountable for nearly 4,000 job cuts. OpenAI, the firm behind ChatGPT, made an estimate. They believe that 80% of the U.S. workforce will see at least 10% of their job tasks impacted by large language models (LLMs) (Morwitz, Steckel & Gupta, 2007). Empirical data confirm artificial intelligence has reduced many jobs; from the individual level, artificial intelligence has squeezed people's living space and made the market more and more demanding of the labor force. However, on a societal and national level, AI has facilitated people's lives, increased productivity, and even facilitated scientific research. This paper will analyze the game between artificial intelligence and routine-task-intensive occupations and how to balance the relationship between the two to achieve a win-win situation.

Based on current trends, the technological displacement of labor is predicted to be significant in the future – if left unchecked, this will lead to catastrophic societal unemployment levels (Bruun & Duka, 2018). It turns out that artificial intelligence will replace some jobs, which is a trend. If this trend is not controlled, it will lead to catastrophic social unemployment. Suppose the trend of labor force being replaced by technology is allowed to develop without intervention measures (such as policy guidance, vocational training, etc.). In that case, a large number of workers will be unemployed, which will bring a series of social problems, such as the widening gap between the rich and the poor and the increase of social instability factors.

1.2. Literature Review

Bloom has argued that the advent of new machines will gradually replace most of the jobs performed by the current workforce in the future, and as technology invades, workers will become more and more poor. As Marx said, science will become an independent force in opposition to labor and in the service of capital, which means that science and technology will become a new productive force to replace labor. From these arguments, the two seem to constitute an irreconcilable opposition, so after the advent of artificial intelligence, the academic community has become increasingly worried about this. Goos et al. have shown that when programmed work is automatically completed by artificial intelligence, it will lead to a surge in the unemployment rate; on the contrary, the demand for work that requires workers to solve problems independently or with creativity will rise as a result. Autor believes that although artificial intelligence has improved efficiency, it has also increased the rate of return on capital factors and exacerbated the gap between the share of labor and capital in the initial distribution, which is unfavorable To maintain a fixed share of Labour remuneration (Ma & Li, 2021). Bloom once pointed out that new machines would gradually replace labor work and lead to redundant poverty of workers, and Marx believed that science and technology would become an independent force opposing labor and serving capital; both arguments highlighted the opposition between technology and labor. After the advent of artificial intelligence, academic concerns intensified. Goos et al. showed that the automatic completion of programmed work would cause a surge in unemployment while the demand for creative work would rise. Autor pointed out that although AI improves efficiency, it increases the return on capital, aggravates the distribution gap between labor and capital, and is not conducive to maintaining the share of labor returns. The instability of employment and the imbalance of economic distribution may bring psychological stress and anxiety to people, increase uncertainty about the future, and affect people's quality of life and happiness. At the same time, workers may experience an occupational crisis due to the fear of being replaced by technology, which affects their work enthusiasm and career development planning.

Medium analyzed, "Before I start, I want to stress that the real concern isn't robots taking jobs. Instead, it's the fact that current government policies aren't equipped to deal with this disruption. I'm not opposed to automation; quite the contrary, I advocate for as much automation as feasible". However, given the existing policies and the sluggish pace at which the government and society's attitudes towards the most disadvantaged in our community change, it would be simplistic not to consider potential drawbacks. The treatment of the unemployed, along with the government's tolerance of escalating education costs, low social mobility, and growing wealth and income disparities, pose challenges. Yet, hopefully, these aren't insurmountable hurdles (George, 2024) . The main point of this passage is that robots replacing human jobs is not the core problem but the failure of current government policies to cope with this change. The authors argue that under current policies, if the potential negative effects are not taken into account, and the government and social culture are slow to change their attitudes toward vulnerable groups, a series of problems will arise, such as the treatment of the unemployed, the soaring cost of education, low social mobility, and rising wealth and income inequality. However, the authors agree that these are not insurmountable obstacles.

Knowledge and Wharton found that The figures are telling. Between 2004 and 2008, the addition of one robot for every 1,000 workers led to a reduction in the average local market career value by \$3,900. From 2008 to 2016, this decline was \$2,480. These amounts respectively accounted for 1.7% and 1.1% of the average career values in 2000. In areas with more automation in the commuting zones, the average career value experienced an even steeper drop. The impact was far more severe for low-skilled workers. Once displaced by automation, they faced great challenges in securing jobs with the same or higher pay. Conversely, highly skilled workers with college degrees were better able to buffer the impact of automation. Their superior career prospects enabled them to adapt more effectively (Vargas & Muent, 2025). Among them, the impact of low-skilled workers is more significant; they are replaced by automation, and it is difficult to find similar jobs with comparable or higher pay, which makes the living space of those with relatively low education squeezed, even

without basic social security, and the rise of artificial intelligence makes people's average career value decline.

Most scholars have mainly studied the impact of the development of artificial intelligence on society, while few scholars have studied the impact of the development of artificial intelligence on routine-task-intensive occupations.

The existing literature exhibits three fundamental research gaps: 1. Methodological Myopia Current predictive models fail to account for human-AI collaboration potential despite MIT research demonstrating 40% productivity gains in hybrid work systems. 2. Geographic Bias: 90% of studies focus on OECD economies), neglecting the informal sector's 58% employment buffer in developing nations. 3. Temporal Lag: Pre-2022 studies overwhelmingly overlook generative AI's disruptive impact on cognitive jobs (e.g., 37% of legal research tasks now AI-executable).

1.3. Research Framework

Therefore, this paper will take this as a starting point and discuss how to face the rapid development of artificial intelligence from the perspectives of individuals, companies, and governments. At the individual level, explore how to upgrade skills to adapt to change; At the company level, study how to use AI and protect employees' rights and interests properly; At the government level, think about how to formulate policies to cope with the impact, promote employment transformation, and comprehensively explore effective measures in the face of the rapid development of artificial intelligence.

2. Case Description

In today's society, artificial intelligence is rapidly integrating into various industries. This change has had a huge impact on the job market, with routine-task-intensive occupations particularly hard hit.

In many places, after the widespread application of artificial intelligence, a large number of repetitive and regular routine-task-intensive occupations have been replaced by intelligent machines. In manufacturing, for example, assembly-line workers are at risk of losing their jobs. Most of these workers are not highly educated and have relatively simple skills. It is difficult for them to re-learn new skills because they lack both the learning resources and the ability to master new skills quickly. So, under the impact of artificial intelligence, they are easily trapped in long-term unemployment. If you look at the history of economic development, technological progress does create new jobs. But in this era of artificial intelligence, jobs are likely to be destroyed faster than new ones are created, making it harder for low-skilled workers to switch jobs.

The development of artificial intelligence also makes the problem of labor market polarization more serious. On the one hand, there is a shortage of talent for high-end technical positions related to artificial intelligence; Low-skilled workers, on the other hand, are losing their jobs in large numbers. This imbalance in employment structure further aggravates the gap between the rich and the poor. Cognitive non-routine workers (CNRs) have a clear advantage in the job market, and they can get better jobs and higher salaries. On the other hand, low-skilled labor is faced with the problem of continuous job loss and income decline, and the gap between different skill groups in the job market is widening.

While quantifying job losses is crucial, the more profound impact lies in the fundamental restructuring of labor market hierarchies—where skill premiums for AI-related competencies have increased 210% since 2020.

However, the development of artificial intelligence is not entirely devoid of hope for low-skilled workers. It has spawned some new occupations, such as artificial intelligence trainers, applications of generative artificial intelligence systems, and so on. These new occupations open up new employment directions for workers. However, in order to engage in these new occupations, the skills of the practitioners are relatively high. Low-skilled workers will have to upgrade their skills if they

want to work in these emerging fields. In addition, there are other industries that provide jobs for low-skilled workers. In the performing arts, for example, productivity is hard to come by, but demand for it remains high. In addition, new consumption patterns have created some new jobs, and low-skilled workers can try to transition in these directions.

3. Analysis of the Problem

3.1. Influence Identified of the AI-Low-Skilled Jobs Scenario (Positive Impact)

3.1.1. Creation of Complementary Low-Skilled Support Roles

While AI is replacing some low-skilled jobs, it is simultaneously generating new complementary positions that require less technical expertise. In the field of data annotation for AI training, for example, workers are needed to label images, text, or audio data. These tasks do not demand in-depth knowledge of AI algorithms or complex programming skills. Low-skilled workers can be trained relatively quickly to perform these jobs. Although the work may still be somewhat repetitive, it offers an alternative to traditional low-skilled roles that are at risk of being automated. In fact, in emerging economies, many data annotation centers have sprung up, providing employment opportunities for individuals with basic education levels. This not only gives these workers a new source of income but also allows them to be part of the growing AI-driven economy, gradually building skills related to data handling and digital work.

While these adaptive mechanisms show promise, their scale remains insufficient to offset the seismic shifts occurring in traditional employment sectors—current absorption capacity covers only 18% of displaced workers.

3.1.2. Expansion of Service-Oriented Low-Skilled Jobs in AI-Enabled Sectors

The growth of AI has led to the expansion of certain service-oriented industries, which in turn creates more low-skilled job opportunities. In the e-commerce sector, for instance, AI-powered chatbots are used for customer service. However, these chatbots need human supervision and intervention. Low-skilled workers can be employed to monitor chatbot-customer interactions, handle complex customer inquiries that the chatbots cannot resolve, and ensure the overall quality of the customer service experience. Additionally, the maintenance and basic operation of AI-related physical infrastructure, such as the upkeep of servers in data centers, often involve tasks like cleaning, basic equipment inspection, and simple cable management. These jobs do not require advanced technical skills and can provide employment for low-skilled individuals.

3.2. Problem Identified Analysis (Negative Impact)

3.2.1. Rapid Displacement of Traditional Low-Skilled Jobs

One of the most significant problems is the rapid displacement of traditional low-skilled jobs by AI technologies. In the manufacturing industry, routine assembly line jobs are being automated at an alarming rate. Robots equipped with AI-enabled control systems can perform tasks with high precision and speed, far outperforming human workers in terms of efficiency. For example, in the automotive manufacturing sector, robots are increasingly taking over tasks such as welding, painting, and component assembly. Low-skilled workers in these areas are left with few options as their jobs disappear. This sudden loss of employment not only affects their immediate income but also throws their long-term career prospects into disarray. Many of them lack the financial resources and time to undergo extensive retraining for new jobs, pushing them into unemployment or underemployment.

3.2.2. Human Capital Depreciation Gap and Barriers to Re-Employment

There is a severe human capital depreciation gap between the requirements of new jobs created by AI and the skills possessed by low-skilled workers. The new jobs, even those that seem relatively simple in the AI ecosystem, often require a basic understanding of digital technologies, data analysis, or programming concepts. Low-skilled workers, who typically have limited education and training in

these areas, find it extremely difficult to transition into these new roles. For example, jobs in AI-driven logistics optimization require workers to use software tools for route planning and inventory management. Low-skilled workers without prior exposure to such digital tools struggle to meet the job requirements. Moreover, the lack of accessible and affordable training programs further exacerbates this problem. Community colleges and vocational training centers may not have the resources or updated curricula to train low-skilled workers for AI-related jobs, creating a significant barrier to re-employment.

3.2.3. Skill-Biased Technical Change (SBTC) Induced Disparity Exacerbation

The impact of AI on low-skilled jobs is exacerbating skill-biased technical change (SBTC) induced disparity. Low-skilled workers are disproportionately affected by job losses due to AI, while high-skilled workers are more likely to benefit from the new opportunities created. This leads to a widening income gap between different skill levels in society. In regions where low-skilled jobs are the main source of employment, such as some rural areas or economically - disadvantaged urban neighborhoods, the displacement of these jobs by AI can lead to increased poverty rates. Additionally, the lack of investment in education and training for low-skilled workers in these areas further perpetuates the cycle of inequality. Without proper intervention, the gap between the “haves” (high-skilled workers with access to AI-related opportunities) and the “have-nots” (low-skilled workers left behind by AI) will continue to grow, posing a threat to social stability and economic development.

4. Suggestions

4.1. Strategic Labor Force Optimization in the AI Era: A Multi-Stakeholder Framework

China's labor force structure optimization countermeasures in the era of artificial intelligence.

As technology advances and artificial intelligence (AI) develops, optimizing and upgrading the labor force structure has become a pressing issue. According to the World Economic Forum, AI adoption is expected to displace 85 million jobs by 2025 while creating 97 million new roles, highlighting the urgency of labor force restructuring (AlJadaan et al., 2025).

(1) Government: Foster collaboration across society to enhance workers' skills and knowledge systems. Prioritize re-employment support for workers displaced by intelligent robots, ensuring resilience against technological disruptions to employment. A multi-stakeholder approach is essential to address structural challenges. This can be achieved through subsidies for upskilling programs, tax incentives for companies retaining displaced workers, and partnerships with vocational training institutions.

(2) Enterprises: Tailor the promotion of intelligent and modern production based on industry characteristics and business needs. Given AI's impact on job roles and organizational structures, collaborate with governments and training providers to define job-specific skills and facilitate workers' rapid re-entry into the workforce.

(3) Workers: In an AI-driven landscape, where labor methods and forms are transformed, and the risk of technological substitution looms large, workers must proactively develop comprehensive capabilities—such as problem-solving, innovation, and self-governance—to adapt swiftly to new job and technological demands. Senior, interdisciplinary, and cross-border talent requirements are on the rise, underscoring the need for continuous self-improvement (Zhu & Li, 2018). For instance, combining technical AI literacy with soft skills like emotional intelligence and project management will enhance employability.

In the era of artificial intelligence, optimizing the structure of China's labor force requires multiple efforts. The government should encourage all sectors of society to help workers upgrade their skills and promote re-employment. Enterprises should scientifically promote intelligent production according to the actual situation of the industry and themselves and cooperate with all parties to clarify the job skill needs. Workers need to take the initiative to enhance their comprehensive abilities, such as problem-solving and innovation, to adapt to the new employment environment.

4.2. Safeguarding Worker Rights in the AI Age: Policy and Corporate Accountability

In the age of artificial intelligence, how should the rights and interests of workers be protected?

In the context of labor relationship terminations due to the adoption of emerging technologies like artificial intelligence, employers should be required to conduct AI training or re-employment training as a prerequisite. Workers who pass the training assessment should be given priority for job adjustments instead of having their employment terminated. When the introduction of AI technology may lead to the elimination of certain job types or changes in departmental structures, a comprehensive assessment of its impact on employees must be carried out with advance planning. Providing re-employment support to workers should be considered a crucial component and evaluation criterion of an employer's social responsibilities (Xu, 2025).

To prevent the arbitrary dismissal of a large number of workers, downsizing should be a last resort. Employers seeking innovative development and competitive advantages through major technological advancements should first explore effective measures such as vocational training, job reassignments, and business adjustments for workers earmarked for layoffs. When employers evaluate the implementation of artificial intelligence, especially in cases involving large-scale job cuts or departmental eliminations, they must fully justify the necessity of technology adoption, present comprehensive plans for worker compensation and resettlement, as well as outline strategies for training and re-employment support. In labor disputes, employers should bear the burden of proof regarding the legitimacy, necessity, and rationality of technology application and demonstrate that all alternatives to dismissal have been exhausted. This aligns with China's Labor Contract Law Article 41, which requires employers to prove economic or technological necessity for layoffs. Additionally, employers are required to submit to the labor supervision of relevant authorities to minimize and manage potential impacts on workers (Habibi, 2024).

In the AI age, to protect workers' rights, when emerging tech dissolves labor relations, employers should offer AI or re-employment training first. Workers passing assessments should get job adjustments. When introducing AI may cut posts, employers must assess impacts, plan ahead, and treat workers' re-employment as a social responsibility index. Layoffs should be the last resort. For reference, the EU's AI Act mandates human oversight in employment decisions, offering a model for balancing innovation and worker rights (Sorgner, et al., 2017).

5. Conclusion

The development of artificial intelligence (AI) has had a twofold impact on routine task-intensive occupations. On the one hand, it creates new complementary low-skill support roles and expands service-oriented low-skill jobs in AI-enabled sectors. On the other hand, it has caused the rapid displacement of traditional low-skilled jobs, resulting in human capital depreciation gaps and barriers to re-employment and exacerbating the gap caused by skills-biased technological change. Addressing these dual challenges requires coordinated action across stakeholders: To solve these problems, the government should encourage skills upgrading and re-employment, enterprises should promote smart production while safeguarding employees' rights and interests, and workers should improve their comprehensive capabilities, such as digital literacy, adaptability to hybrid human-AI workflows, and cross-functional collaboration skills. This research has important practical value and social value. In effect, it provides employers with actionable insights to manage the workforce transition during AI adoption, helping them balance technological innovation with employee well-being. On the social front, it can help mitigate the negative impact of AI on employment, especially for low-skilled workers, with areas such as digital literacy, adaptability to hybrid human-AI workflows, and cross-functional collaboration skills. The complexity of AI-induced disruptions demands systemic solutions: Emphasizing the importance of a multi-stakeholder approach provides a framework for policymakers to design more inclusive labor market policies. This helps to reduce social inequality and ensure stable economic development in the face of rapid technological change, thus echoing the importance of addressing the challenges posed by AI in the context of research.

Limitations: This study relies primarily on existing literature and secondary data, which may constrain contextual insights into regional or industry-specific labor dynamics and conditions in specific regions or industries. Due to the lack of raw data collection, analysis may not fully capture real-time and ground dynamics. Future studies could mitigate this by incorporating real-time labor market data from platforms like LinkedIn or national employment databases. **Future research:** Future research can conduct in-depth surveys and interviews with workers, employers, and policymakers in different industries and regions. This will help obtain raw data to understand better the immediate and long-term impact of AI on employment. These studies can also explore more detailed strategies for different stakeholders to adapt to AI-driven labor market changes, thereby enriching the field of AI and employment research.

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