

AI as a Labor Market Disruptor: Analyzing Impacts on Employment and Skills

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Abstract

This article examines the impact of artificial intelligence (AI) on labor and workforce skills in the modern labor market, focusing on job displacement, job augmentation, and the emergence of new roles. By adopting a strategic management perspective, case studies of Microsoft and SCB illustrate that AI enhances productivity, creates opportunities for skill development, and fosters sustainable business ecosystems. The adaptation of workers, organizations, governments, and educational institutions is critical to transforming AI-related risks into strategic opportunities. Findings indicate that while routine tasks face significant substitution risks, human-centric competencies such as analytical skills, creativity, digital literacy, and human-AI collaboration are increasingly in demand. Investments in reskilling and upskilling, along with appropriate labor policies, can ensure workforce stability, improve employability, and maintain organizational competitiveness. The article concludes by proposing an integrated ecosystem approach and policy frameworks to balance human labor with AI integration effectively, thereby bridging the research gap between technological theory and organizational practice.

Keywords: Artificial Intelligence, Labor, Skill Adaptation, Workforce Development, Labor Policy

Introduction

In recent years, Artificial Intelligence (AI) has advanced rapidly in both cognitive capabilities and practical applications, raising important policy and strategic questions regarding its broader impacts on labor and employment (Brynjolfsson & McAfee, 2014; Agrawal et al., 2018). Recent quantitative studies provide early evidence of shifts in the labor market, particularly in operational roles and occupations involving repetitive tasks that are amenable to automation. These changes have been reflected in employment trends and wage adjustments in recent years (Brynjolfsson et al., 2025). Theoretical perspectives suggest that AI affects labor through two primary mechanisms: automation, which reduces the demand for labor in routine tasks, and augmentation, which enhances productivity and transforms workers' roles toward more advanced skill requirements (Marguerit, 2025; Agrawal et al., 2018). Field surveys and technology exposure indices—metrics designed to assess the degree to which occupations or skills are at risk of or poised to benefit from emerging technologies—further

indicate that the risk of displacement varies across industries, age groups, and skill levels. These differences imply that policy design and support measures must be context-sensitive and differentiated. Beyond quantitative evidence, expert opinions and policy practitioners have also voiced concerns about the economic and social implications of AI. For instance, Geoffrey Hinton, the British-Canadian computer scientist widely regarded as the “Father of AI” for his pioneering work on neural networks—the foundational technology underlying modern AI—has warned about the possibility of substantial job losses in certain occupational groups. His concerns have intensified debates over preventive measures such as reskilling programs and social welfare protections. These observations underscore the need for a systemic analysis that integrates quantitative evidence, theoretical insights, and practical perspectives from public policy organizations to fully understand the structural impacts of AI on the labor market (Brynjolfsson et al., 2025).

Although a substantial body of research and reports has examined this topic, critical knowledge gaps and limitations remain. Most quantitative studies still focus on countries with extensive open data—such as the United States and the United Kingdom—and face constraints in systematically measuring “AI exposure” at the occupational and industry levels. Furthermore, while foundational studies like those by Frey & Osborne (2017) and Brynjolfsson et al. (2025) offer significant insights, there is limited policy synthesis that integrates perspectives from the private sector, academic institutions, and government agencies, particularly within the context of developing countries (Marguerit, 2025). This article addresses these gaps by adopting a strategic management perspective to bridge global technological theories with localized practical case studies. This article therefore aims to address three central questions

- (1) Which types of jobs are most at risk of being displaced by AI?
- (2) How will such changes alter skill requirements?
- (3) Which organizational and policy measures are most likely to mitigate negative impacts and support effective workforce adaptation?

Literature Review

1. Technological Disruption Theory

The concept of technological disruption explains phenomena in which new technologies replace or significantly transform economic and social structures, particularly by altering work processes, production systems, and labor market dynamics (Christensen, 1997). In the case of AI, these transformations occur in two major dimensions: substitution/automation and augmentation (Agrawal et al., 2018). This perspective aligns with the Second Machine Age theory proposed by Brynjolfsson & McAfee (2014), which posits that AI and digital technologies have economic effects comparable to those of the Industrial Revolution by expanding the range of tasks that machines can perform in place of humans. Beyond physical labor, such impacts now extend to cognitive work, including data analysis, writing, and communication (Brynjolfsson et al., 2025). In addition, Geoffrey Hinton has warned that AI

may trigger rapid structural changes. Hinton's perspective underscores the risk that AI may generate macro-level economic disruptions if not accompanied by well-designed policy measures.

Table 1: Conceptual Summary of AI-Driven Labor Transformation

Mechanism	Description	Impact on Labor
Automation	Replacing routine, rule-based tasks with AI algorithms.	Job displacement in manufacturing and data entry.
Augmentation	Using AI as a tool to enhance human productivity.	Role transformation and higher skill requirements.

2. Concepts of Reskilling and Upskilling in the Labor Force

Classical labor market theory explains the relationship between labor supply and demand based on human capital (Becker, 1964). As AI alters the nature of work, reskilling and upskilling have emerged as critical adaptation mechanisms. Reskilling refers to training workers to shift to entirely new roles, such as service workers learning data analysis (Marguerit, 2025). Upskilling involves enhancing existing skills for complex tasks, such as accountants using AI for strategic analysis. From a strategic management perspective, the World Economic Forum emphasizes that investment in these areas is essential for national competitiveness. Furthermore Brynjolfsson et al. (2025) demonstrate that AI is more likely to transform job characteristics and elevate skill requirements than to eliminate all jobs. Workers who adapt quickly are better positioned to benefit from AI than those with limited training access.

Table 2: Adaptation Strategies in the AI-Driven Labor Market

Strategy	Definition	Practical Example	Reference
Reskilling	Training for entirely new roles	Service workers learning data analysis or digital marketing	Marguerit (2025)
Upskilling	Enhancing existing skills	Accountants using AI for strategic analysis	Brynjolfsson et al. (2025)

Impacts of AI on Employment

1. Routine, Manual, and Data-Processing Jobs Are Most Susceptible to Displacement

AI and automation systems have increasingly replaced jobs characterized by routine, rule-based tasks, such as manufacturing work, warehouse operations, and basic customer service roles (Frey & Osborne, 2017). These occupations face a high risk of displacement because algorithms and robots can perform repetitive tasks with greater accuracy, speed, and lower cost compared to human labor (Brynjolfsson et al., 2025). Additionally, data-processing tasks—such as data verification, form entry, and

certain types of financial transaction management—are being substituted by AI equipped with natural language processing and machine learning capabilities, enabling the rapid processing of large volumes of information.

2. Job Categories in Which AI Enhances Human Productivity

Conversely, AI also plays a critical role in augmenting human labor by serving as a tool that enhances decision-making and improves the efficiency and accuracy of complex tasks (Agrawal et al., 2018). For example, physicians can use AI to analyze medical images, reducing diagnostic time while increasing precision. In the business sector, AI assists in analyzing consumer behavior, forecasting market demand, and supporting strategic decision-making, thereby enabling employees in marketing, finance, and supply chain management to work more efficiently and accurately (Tang, 2025). Thus, occupations that require analytical thinking, creativity, and social intelligence—such as critical thinking, creative problem-solving, and interpersonal communication—are more likely to be augmented by AI rather than replaced (Brynjolfsson & McAfee, 2014).

Table 3: Comparative Analysis of AI Impacts across Occupational Groups

Impact Type	Occupational Group	Key Characteristics	Outcome
Substitution	Manufacturing, Warehouse, Data Entry	Routine, rule-based, repetitive	High displacement risk
Augmentation	Healthcare, Marketing, Finance	Analytical, creative, strategic	Productivity and precision gain
Creation	AI Trainers, Ethicists, Specialists	Human-AI collaboration, ethics	New labor economy emergence

3. Emergence of New Data- and AI-Related Occupations

Although AI displaces certain types of work, it simultaneously generates new occupations that did not previously exist in the labor market. For example, AI trainers are specialists responsible for improving model quality by preparing and cleaning datasets to ensure that AI systems operate accurately (Olson, 2024). Data ethicists oversee the ethical use of AI, ensuring transparency, fairness, and non-discrimination (Marguerit, 2025). Human–AI interaction specialists design systems that enable seamless collaboration between humans and AI, including both user interfaces and business processes. Geoffrey Hinton further notes that the emergence of these new roles not only compensates for some of the jobs lost but also indicates the formation of a new labor economy in which humans and machines must work together.

Impacts of AI on Workforce Skills

1. Skills That Are Becoming Less Important

AI and automation have reduced the importance of skills associated with routine tasks and work processes that follow fixed, rule-based procedures such as data entry, document verification, basic calculations, and manual labor in production lines (Brynjolfsson et al., 2025). These types of work are particularly vulnerable to technological substitution because AI can perform such tasks more rapidly, accurately, and at lower long-term cost than human labor (Agrawal et al., 2018). In many cases, organizations adopting AI have also been able to reduce human errors and significantly increase efficiency in large-scale data processing. For example, the finance and banking industries now use AI instead of human staff to review transactions, screen for risks, and detect fraud automatically. Similarly, the manufacturing sector has shifted from manual labor to AI-powered robotic systems and automated arms. These trends indicate that skills centered on repetition and strict procedural compliance are becoming increasingly devalued. Consequently, workers must shift toward developing new skills that are more difficult for AI to replicate or replace.

Table 4: Shift in Workforce Skill Demands (Part 1: Devalued Skills)

Category	Skills Becoming Less Important	Industry Examples	Primary Driver
Administrative	Data entry, document verification	Finance and Banking	AI-driven automated review
Technical/Manual	Manual labor, basic calculations	Manufacturing	Robotic systems & automated arms
Process-Oriented	Strict procedural compliance	Large-scale data processing	High speed & lower long-term cost

2. Skills Increasing in Demand

While AI replaces routine tasks, human skills that are difficult to replicate have become increasingly important. In particular, analytical skills—the ability to interpret and evaluate complex data—play a crucial role in strategic decision-making within environments characterized by high complexity (Tang, 2025). Creativity is another essential skill that current AI systems cannot fully emulate, especially in areas such as innovation design, product development, and critical thinking for solving novel problems (Brynjolfsson & McAfee, 2014). At the same time, digital literacy—the ability to understand and use digital tools and AI platforms—has become indispensable across all sectors of the workforce to enhance effectiveness when working alongside intelligent technologies. Another key competency is collaboration with AI, which refers to the ability to work efficiently with AI systems, including controlling, monitoring, and refining AI outputs to ensure that the technology supports human work appropriately and responsibly (Marguerit, 2025). Collectively, these skills not only enable

workers to adapt more rapidly to new tasks but also empower individuals to create added value for their organizations and contribute to sustainable competitive advantage.

Table 5: Summary of Skills Increasing in Demand in the AI Era

Skill Category	Key Competencies	Strategic Importance
Cognitive Skills	Analytical thinking, Data evaluation, Creativity	Strategic decision-making and innovation design
Digital Proficiency	Digital literacy, AI platform usage	Enhancing effectiveness in the digital workforce
Human-AI Synergy	Collaboration with AI, System monitoring	Ensuring responsible and appropriate AI support

3. Examples from Various Industries

The adaptation of workforce skills to AI is evident across several key industries, each demonstrating distinct demands for new competencies. The first example is the healthcare sector, where physicians and nurses have begun using AI to analyze medical images such as X-rays, MRIs, and CT scans to detect abnormalities that might be overlooked by the human eye. The application of AI in this context does not imply a direct replacement of healthcare professionals ; rather, it increases the need for personnel to possess skills in interpreting complex data and collaborating effectively with AI systems, enabling precise and responsible medical decision-making that safeguards patient outcomes.

In the finance sector, these changes are even more pronounced as organizations employ AI to forecast risks, build financial models, and detect anomalies in transactions to prevent fraud or economic crises. Such applications have made analytical skills and digital literacy essential competencies for all financial analysts. Without these skills, even the most advanced AI systems cannot be effectively interpreted or leveraged to make appropriate strategic decisions.

In the manufacturing industry, AI has been applied both in real-time quality inspection and in controlling complex production processes to reduce waste and enhance efficiency (Brynjolfsson et al., 2025). This shift requires production-line workers to develop higher-level technical skills, particularly the ability to adapt to automated systems and to use digital tools in conjunction with AI, ensuring that manufacturing processes are conducted safely and maintain high quality. Consequently, positions that previously relied on repetitive manual labor are being replaced by roles that are more complex and demand advanced skill sets.

In the education sector, AI has been employed to develop personalized learning systems that tailor instructional content to the needs of individual students (Marguerit, 2025). This transformation requires teachers and instructors to move beyond the traditional role of knowledge transmission and

to develop skills in learning experience design as well as in coordinating with AI systems to ensure that students receive effective, individualized learning experiences.

Table 6: Comparative Analysis of AI Applications and Skill Demands Across Industries

Industry	AI Application	New Skill Demands
Healthcare	Medical image analysis (X-ray, MRI, CT)	Data interpretation & Human-AI collaboration
Finance	Risk forecasting & fraud detection	Analytical skills & digital literacy
Manufacturing	Quality inspection & process control	High-level technical & automated system adaptation
Education	Personalized learning systems	Learning experience design & AI coordination

Overall, examples from these four industries indicate that AI not only diminishes the importance of certain skills but also generates new demands that emphasize creativity, analytical thinking, and effective collaboration with intelligent technologies. In other words, this transformation represents an opportunity for workers who are prepared to develop their skills in alignment with the new context, enabling them to enhance their value in the labor market in a sustainable manner.

Applied Case Studies

The multinational corporation Microsoft employs AI across various organizational functions, ranging from enhancing employee productivity to developing platforms like Microsoft 365 Copilot and Azure AI (Castrillon, 2025). The workforce impact is multifaceted, requiring employees to acquire AI-collaboration skills—such as using Copilot for data synthesis and analytical reporting. At the organizational level, AI adoption optimizes productivity and decision-making while fostering a broader business ecosystem (Olson, 2024). This case illustrates that AI generates opportunities for creative and analytical skill development rather than merely replacing human tasks.

In Thailand, Siam Commercial Bank (SCB) exemplifies local AI integration for customer service and financial analysis (Bangkok Post, 2025). By deploying intelligent chatbots and real-time credit assessment systems, SCB requires its workforce to enhance digital literacy and human-AI collaboration to oversee complex outputs. The organizational benefits include mitigating repetitive tasks and increasing service efficiency. This case demonstrates that non-tech-centric organizations can successfully leverage AI, provided that workforce skill adaptation is prioritized to maximize technological effectiveness.

Management and Policy Approaches

1. The Role of Organizations in Reskilling, Upskilling, and Workforce Transition

Organizations play a central role in mitigating AI's impacts by concretely guiding adaptation through reskilling and upskilling to align capabilities with market demands (Agrawal et al., 2018). Training programs should integrate technical competencies such as AI platform usage and data management with analytical skills for strategic decision-making. Moreover, workforce transition programs are essential for roles at high risk of automation, enabling personnel to shift toward sectors with growing labor demand (Brynjolfsson et al., 2025). Implementing these initiatives minimizes business risks related to skill shortages and fosters a lifelong learning culture (Agrawal et al., 2018). Beyond competitiveness, such strategies enhance employee engagement and job security (Brynjolfsson et al., 2025). Ultimately, managing workforce transitions is a decisive long-term strategy for establishing a human-AI equilibrium and ensuring organizational success.

2. The Role of the Government in Labor Policy, AI Regulation, and Social Safety Nets

The government plays a crucial role in shaping labor markets amid AI-driven transformations. A primary responsibility is establishing policy frameworks that support skill development, enabling workers to remain competitive (Green, 2024). Additionally, critical regulatory functions must promote responsible AI use—addressing fairness, transparency, and data protection. Regarding worker protection, robust social safety nets—including expanded social security, basic income schemes, and job-matching initiatives—are essential to alleviate economic pressures on displaced workers (Green, 2024). Furthermore, the government should facilitate tri-sector collaboration (private sector and educational institutions) to align reskilling programs with market demands. Ultimately, balanced labor policies and flexible legal frameworks can ensure a smooth transition, reducing inequality and fostering stable working environments (Green, 2024).

3. The Role of Educational Institutions in Curriculum and Skills Adaptation

Educational institutions play a critical role in preparing the workforce for the AI era through curriculum enhancement aligned with labor market demands. Courses must integrate digital literacy, data analytics, and AI ethics emphasizing transparency, fairness, and responsible usage alongside human-AI collaboration. Furthermore, promoting lifelong learning is essential for continuous skill upgrades in response to evolving technology. Institutions should also strengthen partnerships with the private sector and government agencies such as through internships or applied research to ensure curricula remain responsive to industry needs. Ultimately, educational institutions serve as a vital link between the workforce and the modern economy, enabling workers to leverage AI as a tool for generating real value.

Discussion

The findings of this study and the applied case examples clearly indicate that AI is a technology with dual impacts on the workforce, encompassing both “risks” and “opportunities”

(Brynjolfsson et al., 2025; Agrawal et al., 2018). Routine and manual tasks, such as data entry or repetitive production-line work, are particularly susceptible to replacement by automation and AI (Brynjolfsson et al., 2025). Conversely, roles that require creativity, deep analytical thinking, and complex decision-making are becoming increasingly important, as AI is not yet able to replicate human judgment, contextual understanding, and value-based reasoning (Agrawal et al., 2018). This reinforces the "augmentation" thesis over pure "substitution," suggesting that the human element remains indispensable in high-complexity environments.

The Microsoft case study demonstrates that global organizations can use AI not merely as a replacement mechanism but as an augmenting tool to enhance overall organizational capabilities (Castrillon, 2025). The integration of AI in routine functions, such as large-scale data analysis and support system management, allows employees to devote more time and resources to strategic and high-value tasks (Olson, 2024). This example highlights how systematic AI adoption can foster a sustainable business ecosystem, where human labor remains crucial but requires reskilling and upskilling to adapt to new job requirements (Castrillon, 2025; Olson, 2024).

Similarly, the case of SCB in Thailand illustrates that AI implementation in customer service and financial analytics not only improves operational efficiency but also creates opportunities for employees to learn and develop new skills, including digital literacy and human-AI collaboration. As a result, employees' roles are not diminished; rather, their capabilities are enhanced to handle more complex tasks that generate higher value within the organizational value chain (Bangkok Post, 2025). These localized findings bridge a critical research gap, showing that AI exposure in emerging markets like Thailand follows a similar augmentation pattern to that seen in developed economies.

The study also demonstrates that the adoption of AI reduces the relevance of certain skills, such as manual or routine work, while increasing the demand for analytical thinking, creativity, digital literacy, and collaboration with AI in the labor market (Marguerit, 2025). These changes reflect a major restructuring of the workforce, requiring continuous learning and skill development.

From a management and policy perspective, organizations must implement systematic reskilling and upskilling programs (Agrawal et al., 2018). Investment in skill development is not only a human resource strategy but also a source of competitive advantage in the AI era (Brynjolfsson et al., 2025). Governments have a critical role in establishing AI legislation that aligns with labor contexts, emphasizing transparency, fairness, and worker protection, as well as instituting social safety nets to mitigate negative impacts, such as workforce training funds or job transition support (Green, 2024; Brynjolfsson & McAfee, 2014). Specifically, policy interventions should focus on "Human-AI Synergy" regulations to ensure that the transition remains equitable.

Educational institutions are equally important in adapting curricula to meet the demand for new skills through industry partnerships. AI should be viewed not simply as a labor-replacing technology but as a strategic factor that reshapes the balance of labor and generates opportunities for

skill development (Castrillon, 2025; Bangkok Post, 2025). When workers adapt, organizations invest in development, and governments establish appropriate frameworks, AI becomes a reinforcing factor that enhances sustainability and strategic advantage in the labor market (Brynjolfsson & McAfee, 2014; Agrawal et al., 2018).

Conclusion and Recommendations

1. Overview of AI's Impact on the Workforce

The study finds that AI is transforming the workforce structure across multiple dimensions, creating both opportunities and challenges simultaneously. Routine tasks, such as data entry, document verification, and basic calculations, are highly susceptible to automation, as AI can perform these tasks faster and more accurately than humans (Brynjolfsson et al., 2025). In the manufacturing sector, repetitive manual labor is similarly being replaced, placing these workers at elevated risk (Agrawal et al., 2018).

However, AI does not solely produce negative impacts; it also generates new opportunities for workers with skills in creativity and analytical thinking, which AI cannot yet fully replicate (Brynjolfsson et al., 2025). Moreover, effective collaboration with AI has become a critical skill that enhances employees' value to organizations (Marguerit, 2025). Emerging competencies, such as digital literacy, are increasingly important, as workers must understand and utilize digital tools and AI systems in daily tasks.

Workers who develop these skills in a timely manner will gain the most from the transformation not only retaining their existing roles but also advancing to higher-value positions (Agrawal et al., 2018). Therefore, the overall impact of AI on the workforce should transcend the narrow "job-replacement" narrative. Instead, it should be understood as establishing a new labor market equilibrium: while some jobs decrease in importance, many others increase in significance. Workers who can learn and align their skills with the demands of the digital economy can strategically convert displacement risks into career development opportunities. (Marguerit, 2025).

2. The New Balance Between Human Labor and AI

AI should not be viewed merely as a "labor-replacing machine" but rather as a strategic partner that enhances human productivity and performance (Castrillon, 2025). Case studies show that integrating AI does not render human labor redundant; instead, it facilitates synergistic work processes that combine the unique strengths of both humans and technology (Bangkok Post, 2025). For instance, tasks requiring complex decision-making and social communication still primarily rely on humans, while AI provides rapid data processing and analytical support, enabling more accurate and effective decisions (Castrillon, 2025). This new balance reflects a shift in the labor market, no longer characterized by a separation of "human work" versus "AI work," but by integrated human-AI collaboration where both complement each other's strengths (Bangkok Post, 2025).

Workers who understand how to use AI appropriately and can oversee system operations gain increased value within the organization (Castrillon, 2025). At the organizational and policy levels, this paradigm shift requires structural adaptation. Organizations must invest in reskilling programs and foster a culture of continuous learning, while governments must enact laws that support fair and sustainable human–AI coexistence. Thus, the new labor balance is not about complete replacement; rather, it represents an integration of human creativity and decision-making with AI’s speed and precision, leading to sustainable business ecosystems and long-term competitive advantage. (Castrillon, 2025; Bangkok Post, 2025)

3. Strategies to Transform “Risk” into “Opportunity”

Adaptation to the AI era cannot rely solely on workers; it demands a multi-stakeholder strategic alliance involving organizations, governments, educational institutions, and the workforce (Agrawal et al., 2018). For organizations, the priority is investing in reskilling and upskilling, coupled with robust workforce transition programs to assist employees whose roles are displaced, ensuring smooth career adjustments (Agrawal et al., 2018). At the government level, it is essential to establish clear and modern labor policies and AI regulations that ensure fair, transparent, and rights-respecting AI use in the labor market (Green, 2024). This is particularly crucial given the inherent risks of algorithmic bias and data privacy vulnerabilities—often referred to as the 'dark side' of AI—which can lead to unethical labor practices and systemic discrimination if left unaddressed (Watcharodomprasert, 2025). Additionally, robust social safety nets such as basic income schemes, retraining programs, or financial support for workers seeking further education—serve as critical mechanisms to mitigate the impact of labor displacement (Green, 2024).

Educational institutions must update curricula to include digital literacy, data analytics, AI ethics, and human–AI collaboration, thereby preparing a future-ready workforce. Promoting lifelong learning is equally vital to enable workers to adapt to evolving market demands. For workers, an effective strategy is to proactively embrace technological shifts, viewing AI as a tool for strategic advantage rather than a threat (Agrawal et al., 2018). Flexibility and proactive skill development are key to maintaining job security and advancing to higher-value roles.

In summary, workforce management in the AI era must adopt an integrated ecosystem approach that links organizational initiatives, government policy, and educational programs (Green, 2024). When implemented effectively, the risk of AI-driven displacement is transformed into a strategic opportunity for skill development, career advancement, and the creation of long-term competitive advantages (Agrawal et al., 2018).

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