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# RETHINKING THE DEFINITION OF WORKFORCE IN THE AGE OF AI INTEGRATION

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## Abstract

Artificial Intelligence (AI) has transitioned from a peripheral productivity tool to a core organizational actor, reshaping how work is performed, managed, and governed. Organizations increasingly deploy algorithmic systems to conduct tasks traditionally undertaken by human employees, including recruitment screening, performance monitoring, decision support, and workflow optimization. This shift has given rise to a non-human yet operationally embedded actor that performs employee-like cognitive and managerial functions. Drawing on secondary data—including peer-reviewed literature and industry reports from the OECD and European Commission—this paper investigates how AI integration is redefining workforce composition and organizational strategy. The findings reveal three key insights: (1) AI adoption restructures work around human-algorithm collaboration rather than total replacement; (2) algorithmic management systems increasingly function as organizational actors, often impacting employee autonomy and trust; and (3) ethical governance and transparency are essential for operational resilience. The study concludes that organizations must formally recognize algorithmic systems as part of the workforce architecture. Strategic recommendations include integrating algorithmic entities into workforce planning, implementing accountability audits, and establishing robust reskilling programs.

## Keywords

Artificial Intelligence, AI Integration, Human-AI Collaboration, Workforce Architecture

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## 1. Introduction

Artificial Intelligence (AI) has emerged as one of the most disruptive factors influencing the future of employment in an era characterized by fast technological innovation. Organizations are progressively incorporating AI into their workforce, from generative AI systems that support creative and administrative tasks to machine learning algorithms that manage logistics and predictive analytics that guide strategic decisions. Businesses are forced to rethink the definition of workforce itself and management paradigms and reassess operational, ethical and legal frameworks because of the blurring of the lines between artificial and human intelligence.

Traditional ideas of labor and productivity have been transformed by the increasing adoption of AI into business operations. From mechanization during the industrial revolution to digitalization during the information age, advancement in technology has consistently changed industries throughout history. The rise of Human-AI cooperation, however, signifies a fundamentally different change. AI systems may currently do cognitive tasks like language processing, prediction and decision making in addition to automating repetitive tasks. This raises a fundamental question about what qualifies as an ‘employee’, ‘skill’ or even ‘work’. According to the OECD (2023), over 27% of jobs in OECD economies are exposed to significantly AI-driven task transformation, particularly in professional and managerial roles.

Businesses all over the world are implementing AI to boost productivity, cut costs and obtain a competitive advantage (Climent et al, 2024; Nikzat and Noorymotlagh, 2025). But this change has also

brought about new challenges in worker identification, ethical governance and human resource management. AI powered solutions are essential components of corporate ecosystems, whether they are chatbots managing customer support or algorithms assessing worker performance. The worker must therefore adjust to living and working alongside these artificial rivals. The World Economic Forum (2025) estimates that 39% of core workforce skills will change or become outdated by 2030 due to AI adoption. Therefore, this research is important because it highlights that hybrid workforces will become increasingly prevalent in the business world, where both humans and algorithms work together to promote creativity and productivity.

The question of how to redefine the workforce in the AI era is strategically important for several reasons. Firstly, the dynamics of competition are being radically changed by the worldwide trend toward automation and digital transformation. By successfully integrating AI technologies into their workforce, organizations may improve decision-making speed, accuracy, and adaptability, all of which are critical components of sustainable advantage. Second, human resource management functions are being transformed by algorithmic processes, such as AI-powered performance management systems and predictive recruiting analytics. To ensure accountability, transparency and equity in these systems, businesses need to establish new governance frameworks. Lastly, integrating human and AI raises issues with social inclusion, ethics, and employment at the societal level. For both organizational leaders and lawmakers, the ethical ramifications of algorithmic decision-making, the displacement of specific job categories, and the growth of digital labor have become pressing issues.

The purpose of this study is to critically explore the implications of these changes for workforce identity, HRM, organizational strategy and management practices. More specifically, it aims to (a) examine how AI technologies are being integrated into organizational structures and functions traditionally occupied by human employees, (b) analyze the implications of Human-AI collaboration on ethical governance, management and workforce identity, and (c) evaluate strategic approaches that organizations can adopt to properly and successfully manage algorithms.

## 2. Theoretical Frameworks and Literature Review

### *Socio-Technical Systems Theory (STS)*

Socio-Technical systems Theory was introduced by Trist and Bamforth (1951). The theory explains that organizations are made up of both social elements (people, culture, roles) and technical elements (tools, processes, technologies). For an organization to work effectively, these two elements must fit together. Bostrom and Yudkowsky (2014) build on this idea by explaining how AI creates new interactions between humans and machines. This helps to analyze how AI changes work processes and how humans adapt to working with algorithmic systems.

### *Actor-Network Theory (ANT)*

Actor-Network Theory, presented by Latour (2005), suggests that both humans and non-humans, including algorithms, function as 'actors' in a network. They influence decisions, shape processes and create outcomes. This theory is useful because the algorithms behave like an organizational actor. It shapes workflows, influences performance evaluations and affects human behavior. This theory helps explain how AI becomes part of organizational systems and relationships.

### *Collaborative Intelligence*

Daugherty and Wilson (2018) describe collaborative intelligence as a model where humans and AI enhance each other's strengths. This supports the design of work systems in which people and algorithms operate in a complementary and balanced way, aligning with the study's focus on strategic integration and future workforce design. However, limited research treats AI as an organizational actor within workforce identity frameworks. Overall, the literature suggests organizations must adapt by redesigning workflows, strengthening governance, and preparing employees for hybrid environments.

Researchers widely agree that AI is transforming work. Brynjolfsson and McAfee (2014) call this the 'second machine age', where digital technologies reshape how value is created. Unlike earlier automation, AI supports or replaces cognitive tasks such as decision making and prediction. Autor (2015) shows that while routine tasks decline, demand for human judgment increases. Similarly, Davenport and Kirby (2016) emphasize augmentation, where AI enhances rather than replaces human work, and Jarrahi (2018) frames AI as a 'cognitive partner'. Together, these perspectives highlight that AI is restructuring

jobs, skills, and organizations, leading to hybrid work systems.

### ***Algorithmic Management and Workforce Identity***

Algorithmic management refers to the use of algorithms to supervise and coordinate tasks. Lee et al. (2015) show how companies like Uber use algorithms to assign tasks, monitor performance and guide workers' actions. This challenges traditional management structures where human managers and supervisors make most decisions. As algorithmic management expands, employees begin to question what makes their work 'human'. Schwartz et al. (2019) explain that when AI performs tasks such as evaluating performance or making recommendations, workers may struggle to understand their changing role and identity in the organization.

As already mentioned, Daugherty and Wilson (2018) describe this new relationship as collaborative intelligence, in which humans and algorithms rely on each other to produce value. Humans bring judgement, empathy and creativity, while algorithms bring speed, pattern recognition and reliability. This reinforces the idea that AI is not just a tool but a new type of organizational actor which is part tool, part colleague. This study supports the need to explore how human identity, job expectations and work relationships shift when AI becomes part of the workforce.

### ***Ethical and Governance Challenges in Human-AI Integration***

As AI becomes more common in organizations, ethical and governance questions become more urgent. Crawford and Paglen (2019) show that AI can contain hidden biases due to recruitment, promotions or performance reviews. Floridi and Cowls (2019) introduce an ethical framework that includes principles such as fairness, justice, autonomy and transparency. They argue that organizations must use these principles to guide responsible use of AI and reduce harm.

Leicht-Deobald et al. (2019) focus specifically on HRM systems and warn that algorithmic HR tools can create problems related to privacy, surveillance and discrimination. Workers may feel unfairly assessed or monitored since algorithms gather huge amounts of employee data. Organizations run the risk of perpetuating inequality when they depend on opaque algorithms. The necessity for robust governance systems that make AI use transparent, accountable and fair is generally highlighted by ethical literature and policy frameworks, such as the European Commission's Ethics (2019) guidelines for trustworthy AI.

### ***Human-AI Collaboration and Strategic Organizational Approaches***

Another theme in this literature review focuses on how organizations can use AI strategically. Porter and Heppelmann (2015) argue that AI improves organizations' ability to make better decisions, anticipate risks and manage resources effectively. These technologies help managers understand data patterns and respond quickly to changes. Raisch and Krakowski (2021) explain that successful human-AI collaboration requires balancing human judgment with algorithmic accuracy. They argue that neither humans nor AI should dominate decision-making, instead both should complement each other. Companies must adjust their culture, leadership and training systems to support AI adoption. Without these changes, even the best technologies fail to create value.

Amershi et al. (2019) emphasize the importance of designing AI systems that strengthen human creativity rather than limit it. In the same line, Shrestha et al. (2019) argue that organizations need strong 'dynamic capabilities' to continuously adapt to new technologies. These studies support the idea that AI is a strategic tool. Organizations that use AI responsibly can improve performance, creativity and competitive advantage, while those that fail to adopt risk falling behind.

## **3. Methodology**

Secondary data were drawn from open-access and publicly available sources. These include Academic databases like Google scholar, JSTOR, ResearchGate, Institutional repositories and others. These platforms provide peer-reviewed studies such as Brynjolfsson & McAfee (2014), Autor (2015) and Leicht-Deobald et al. (2019). These sources were prioritized for conceptual clarity, methodological transparency and analytical depth. Other secondary data sources include organizational and industry Reports such as Data and Society research reports, OECD and World Economic Forum Publications. These offered insights into workforce transformation, AI Governance and algorithmic management. Furthermore, online media and policy documents have been used in this research, such as Newspaper articles documenting AI adoption, Government AI ethics guidelines, and Public Policy frameworks on AI use.

### ***Data Collection Procedures***

In line with Taherdoost (2021), data collection followed a systematic and transparent process. Keywords were developed based on the research questions, including: ‘algorithmic management’, ‘AI workforce’, ‘Human-AI collaboration’, ‘AI in HRM’, ‘AI ethics’, ‘future of work’. Relevant literature was then sourced from databases including Google Scholar, JSTOR, Deloitte insights, and government policy archives. Inclusion criteria required sources to address AI within organizational contexts, engage with workforce identity, ethics or strategy, be published between 2014 and 2025, be publicly accessible. Sources were excluded if they required subscription-only access, focused on unrelated forms of automation or lacked author or intuitional credibility, thereby ensuring methodological rigor, transparency and replicability in line with Dayarathna (2019) and Creswell and Creswell (2018).

## **4. Findings**

### ***AI integration and the Redefinition of Work***

This section addresses how AI integration has shaped the context and structure of work. Jarrahi (2021) and Raisch and Krakowski (2021) find that AI increasingly performs analytical and predictive tasks, while humans retain responsibility for judgement, ethical reasoning and contextual decision making. AI is not replacing employees wholesale but is altering job design and skill requirements.

OECD (2023) reports that AI adoption has accelerated task automation in analytics, forecasting, customer service and administrative functions, while simultaneously increasing demand for human skills such as judgment, creativity and ethical reasoning. OECD conducted a representative survey of employers in six OECD countries (France, Germany, Italy, Japan, Spain and the United States) between June and August 2024, covering 6047 firms with 20 or more employees, across all sectors of the economy. The data indicated a shift from direct task execution toward task supervision and AI collaboration. This data also highlighted increased demand for skills related to judgement, creativity and ethical decision-making.

### ***Algorithmic Management and Workforce Identity***

This section addresses how algorithmic management systems influence workforce identity, authority structures and autonomy. Evidence across multiple studies such as Kellogg et al. (2020) and Meijerink et al. (2021) indicate that algorithms increasingly mediate scheduling, performance evaluation and promotion decisions, reducing direct human supervision. Studies highlight the expansion of algorithmic management beyond gig-economy platforms into traditional organizations. Workers increasingly interact with systems rather than supervisors, which affects perceptions of autonomy and identity. Evidence from Leicht-Deobald et al. (2021) also shows that employees often struggle to understand how algorithmic decisions are made, leading to reduced trust and role ambiguity. These findings reinforce the view that algorithms are no longer neutral tools but active organizational actors shaping human behavior and workflows.

### ***Ethical and Governance Challenges***

Floridi et al. (2022) identify bias and opacity as persistent challenges in AI-driven HR systems, particularly when algorithms are trained on historically skewed data. Policy frameworks such as the EU Artificial Intelligence Act (2024) reinforce these concerns by mandating human oversight and risk classification for workplace AI applications. The analysis reveals a recurring gap between the pace of AI deployment and the development of governance mechanisms, indicating that many organizations adopt algorithmic systems without adequate ethical safeguards.

### ***Strategic Organizational Responses***

Addressing the issue of strategic organizational responses, the findings indicate that organizations adopting structured human-AI collaboration frameworks experience more sustainable outcomes. Firms investing in AI literacy and ethical governance models report higher workforce acceptance and operational resilience (Deloitte, 2023; Shrestha et al. 2021). These findings underscore the strategic necessity of recognizing algorithms as integral components of workforce design rather than purely technical assets.

## 5. Analysis and Interpretation

This section interprets the findings through theoretical frameworks to address the study's research aims. First, AI is clearly reshaping workforce composition by introducing algorithmic systems that perform employee-like functions. Second, managing these systems introduces ethical and identity-related challenges. Third, organizations require new strategic frameworks to govern human-AI collaboration responsibly.

### *Interpretation through the Theoretical Frameworks*

Using socio-technical systems theory, the findings show that many organizations optimize technical efficiency at the expense of social wellbeing. Algorithmic management tools prioritize performance metrics and surveillance while organizational safeguards for autonomy, mental health and accountability remain underdeveloped. This misalignment reinforces Trist and Bamforth's (1951) argument that failure to jointly optimize social and technical systems results in organizational dysfunction.

Evidence from the ILO (2023) highlights increased psychosocial risks associated with algorithmic monitoring, including stress, burnout and diminished autonomy. From an Actor-Network theory (Latour, 2005) perspective, these outcomes reflect the growing agency of algorithms within organizational networks, where decision authority is partially displaced by human managers. Strategically, these findings suggest that without governance intervention, algorithms may undermine long-term organizational legitimacy despite short-term productivity gains. Furthermore, the displacement of decision authority from human managers to systems contributes to trust erosion and role ambiguity.

### *Patterns, Contradictions and Insights*

A dominant pattern emerging from the analysis is the shift toward hybrid decision making structures, in which algorithmic systems provide analytical input while humans retain responsibility for contextuality judgement and ethical reasoning. This pattern aligns with the collaborative intelligence model proposed by Daugherty and Wilson (2018) and reinforces the empirical findings that AI predominantly augments rather than replaces human decision-making. Across organizational contexts, algorithms increasingly function as cognitive partners, reshaping managerial workflows and redistributing decision authority.

However, a significant contradiction is evident between operational efficiency gains and declining levels of employee trust. While AI-driven systems enhance speed, consistency and predictive accuracy, their opaque and non-transparent nature often undermines workforce engagement and perceived fairness. This tension suggests that technological effectiveness alone is insufficient to secure organizational legitimacy. From a socio-technical perspective, improved performance without corresponding social alignment generates systemic imbalance, ultimately constraining sustainable value creation.

### *Strategic and Policy Implications*

The findings carry significant strategic implications for organizational leaders. Workforce planning models must be reconceptualized to explicitly account for algorithms as embedded organizational actors rather than peripheral technological tools. HRM practices should therefore evolve to incorporate algorithmic accountability audits, transparency protocols and clearly defined human oversight responsibilities. Such measures are critical for maintaining decision integrity, safeguarding employee trust and ensuring alignment between human and algorithmic contributions.

From a policy perspective, the results underscore the importance of enforceable ethical standards and institutional support mechanisms to guide organizational AI adoption. Policymakers play a central role in establishing regulatory frameworks that mandate explainability, accountability and worker protection, while simultaneously promoting AI literacy across industries. These interventions help address ambiguity surrounding responsibility when algorithmic decisions or recommendations result in adverse outcomes and reduce the risk of governance gaps.

At a theoretical level, the findings extend existing workforce and organizational theory by empirically supporting the recognition of algorithms as organizational actors within socio-technical systems. This contributes to emerging debates on digital labor, organizational identity, and the redistribution of agency in AI-mediated workplaces, reinforcing the need for management frameworks that reflect the evolving realities of human-AI integration.

## 6. Conclusion

This study concludes that AI has evolved from a supportive productivity tool into an embedded organizational actor that fundamentally reshapes work, workforce composition and strategic management. Rather than causing widespread job displacement, AI restructures work around human-algorithm collaboration, with algorithms handling analytical and monitoring tasks while humans retain judgement, ethical reasoning and contextual decision-making roles. However, the findings reveal a critical tension between efficiency gains and declining workforce trust and autonomy. Importantly, this research study demonstrates that organizations which embed ethical governance, transparency and human oversight into AI deployment achieve higher workforce acceptance and greater operational resilience, confirming that ethical governance enables rather than constrain innovation. Consequently, organizations must formally recognize algorithmic systems as organizational actors and integrate them into workforce design, governance and strategic decision-making frameworks.

## References

- Amershi, S., Weld, D., Vorvoreanu, M., Fourney, A., Nushi, B., Collisson, P., Suh, J., Iqbal, S., Bennett, P., Inkpen, K., Teevan, J., Kikin-Gil, R. and Horvitz, E. (2019). Guidelines for human–AI interaction. *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*, 1–13.
- Autor, D.H. (2015). Why are there still so many jobs? The history and future of workplace automation. *Journal of Economic Perspectives*, 29(3), 3–30.
- Bostrom, N. and Yudkowsky, E. (2014). The ethics of artificial intelligence, in Frankish, K. and Ramsey, W.M. (eds.) *The Cambridge Handbook of Artificial Intelligence*. Cambridge: Cambridge University Press, 316–334.
- Brynjolfsson, E. and McAfee, A. (2014). *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*. New York: W.W. Norton & Company.
- Crawford, K. and Paglen, T. (2019). Excavating AI: The politics of images in machine learning training sets. *International Journal of Communication*, 13, 1–21.
- Climent, R.S., Haftor, D.M., and Staniewski, M.W. (2024). AI-enabled business models for competitive advantage. *Journal of Business Research*, 9(3), 100532.
- Creswell, J.W. and Creswell, J.D. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. 5th edn. Thousand Oaks, CA: Sage.
- Daugherty, P.R. and Wilson, H.J. (2018). *Human + Machine: Reimagining Work in the Age of AI*. Boston: Harvard Business Review Press.
- Dayarathna, N. (2019). Validity and reliability of secondary data. *International Journal of Research*, 6(1), 1–10.
- Davenport, T.H. and Kirby, J. (2016). Just how smart are smart machines?. *MIT Sloan Management Review*, 57(3), 21–25.
- Deloitte (2023). *AI governance and workforce transformation report*. Deloitte Insights.
- European Commission (2019). *Ethics Guidelines for Trustworthy AI*. Brussels: European Commission.
- European Union (2024) *Artificial Intelligence Act*. Brussels: European Union.
- Floridi, L. and Cowls, J. (2019). A unified framework of five principles for AI in society. *Harvard Data Science Review*, 1(1).
- Floridi, L., Cowls, J., King, T.C. and Taddeo, M. (2022). Governing AI ethics: Foundations, frameworks and practice. *Philosophy & Technology*, 35(1), 1–26.
- ILO (2023). *World Employment and Social Outlook: The role of AI at work*. Geneva: International Labour Organization.
- Jarrahi, M.H. (2018). Artificial intelligence and the future of work: Human–AI symbiosis in organizational decision making. *Business Horizons*, 61(4), 577–586.
- Jarrahi, M.H. (2021). Algorithmic management and the future of work. *Journal of Management Studies*, 58(6), 1–14.
- Jinbao, Z., Liu, Y. and Wang, H. (2025). Reflexivity and bias management in qualitative AI research. *Qualitative Research in Organizations and Management*, 20(1), 45–60.

- Kellogg, K.C., Valentine, M.A. and Christin, A. (2020). Algorithms at work: The new contested terrain of control. *Academy of Management Annals*, 14(1), 366–410.
- Latour, B. (2005). *Reassembling the Social: An Introduction to Actor–Network–Theory*. Oxford: Oxford University Press.
- Lee, M.K., Kusbit, D., Metsky, E. and Dabbish, L. (2015). Working with machines: The impact of algorithmic management on human workers. *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems*, 1603–1612.
- Leicht-Deobald, U., Busch, T., Schank, C., Weibel, A., Schafheitle, S., Wildhaber, I. and Kasper, G. (2019). The challenges of algorithm-based HR decision-making. *Journal of Business Ethics*, 160(2), 377–392.
- Leicht-Deobald, U. et al. (2021). Transparency and trust in algorithmic HRM. *Human Resource Management Journal*, 31(3), 1–15.
- Meijerink, J., Bondarouk, T. and Lepak, D. (2021). Algorithmic management and HRM. *Human Resource Management Review*, 31(1), 100790.
- Nikzat, P., & Noorymotlagh, M. (2025). Artificial Intelligence in Business: Driving Innovation and Competitive Advantage. *International Journal of Industrial Engineering and Operational Research*, 7, 50-62.
- OECD (2023) *Artificial Intelligence and the Labour Market*. Paris: OECD Publishing.
- Porter, M.E. and Heppelmann, J.E. (2015). How smart, connected products are transforming companies. *Harvard Business Review*, 93(10), 96–114.
- Raisch, S. and Krakowski, S. (2021). Artificial intelligence and management: The automation–augmentation paradox. *Academy of Management Review*, 46(1), 192–210.
- Schwartz, R., Vassileva, J. and Lampe, C. (2019). Worker identity and algorithmic evaluation. *Organization Studies*, 40(5), 1–23.
- Shrestha, Y.R., Ben-Menahem, S.M. and von Krogh, G. (2019). Organizational decision- making structures in the age of AI. *California Management Review*, 61(4), 66–83.
- Taherdoost, H. (2021). Data collection methods and tools for research. *International Journal of Academic Research in Management*. 10(1), 10–38.
- Trist, E.L. and Bamforth, K.W. (1951). Some social and psychological consequences of the longwall method of coal-getting. *Human Relations*, 4(1), 3–38.
- World Economic Forum (2025). *The Future of Jobs Report 2025*. Geneva: World Economic Forum.