Information Technology & People

Editorial: Sharing work with AI: introduction to the special issue on the futures of work in the age of intelligent machines

This special issue of *Information, Technology & People* presents research that highlights the complex impact of computer systems with advanced reasoning capabilities – intelligent machines – on workplace tasks. As both pundits and scholars increasingly observe, intelligent machines can now adeptly perform tasks that were previously considered exclusive to humans. Machines regularly recognize images and speech with accuracy approaching, or even surpassing, human abilities. Large language models, too, increasingly display the ability to execute diverse work tasks with greater speed and lower cost than human workers. These growing capabilities are already influencing labor markets and promise to reshape the structure and nature of work in the coming years.

This special issue seeks to stand apart from the ample popular discourse today that primarily emphasizes the job displacement and machine autonomy risks of intelligent machines. Instead, we bring together a set of papers that adopt a more expansive view. Our curatorial aim is to showcase research that, collectively, helps us understand, design and improve work shared with (rather than fully replaced by) intelligent machines. As the World Economic Forum notes, "[intelligent machines] are likely to substitute specific tasks previously carried out as part of these jobs" (2016), so deeply examining the role of intelligent machines within the context of work today can help us better anticipate some potential implications. We know, for example, that while some tasks may be automated, demand for others may increase. For instance, research indicates a rising demand for social skills in such settings (Deming, 2017).

Active participation, not passive acceptance, leads to better adaptation to intelligent machines. Workers benefit from having agency in shaping how these technologies are integrated into their roles. When workers influence AI deployment, it can foster a collaborative relationship – one that puts workers in a position to leverage technology in the service of their interests rather than merely standing as passive subjugants of new modes of work. The application of truly human-centered design principles and collaborative frameworks helps ensure that we define and legitimate human–machine relationships that simultaneously value productivity, innovation and worker well-being. Policy and governance structures must interdependently evolve to align with and, eventually, co-constitute these goals.

The research into the long-term implications of intelligent machines that we feature here further illuminates fundamental changes in job structures and workforce skills, moving beyond surface trends. Workers can gain advantages by preparing for emerging job categories and can harness AI itself to develop new capabilities. Held together, the articles in this special issue further underscore that the ethical dimensions of intelligent machine deployment demand serious attention. Only by addressing algorithmic bias, differential impacts, privacy, energy consumption and transparency can we hope to pave the way for fair and accountable technology implementation. These considerations are integral in shaping future workplaces that serve all stakeholders.

Finally, interrogating the intersection of human work and intelligent machines raises core questions about the nature of expertise and knowledge work itself. While prior attention has focused largely on task-level automation, here a deeper theoretical challenge emerges: understanding how human expertise evolves when augmented by intelligent machines. Traditional models of expertise development, from novice to expert, assume relatively stable

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task environments where mastery comes through deliberate practice. However, when intelligent machines continuously enhance human capabilities, expertise becomes more dynamic and relational – defined not just by accumulated individual knowledge but also by the ability to effectively leverage and integrate machine capabilities. This development suggests the need for new theoretical frameworks and corresponding empirical studies that can capture the co-evolution of human and machine capabilities in workplace settings.

This special issue presents seven papers that explore these issues by examining different aspects of work with – rather than by – intelligent machines.

Liao *et al*. (2024) conduct a field experiment to explore the effects of AI augmentation on the performance of sales agents. They compare sales outcomes for interactions handled by agents with and without AI support and find that AI augmentation leads to a significant 5.46% increase in sales. Notably, the impact varies by experience level, with inexperienced agents benefiting nearly six times more than their seasoned counterparts. Their analysis reveals that AI augmentation enhances response timeliness, accuracy and sentiment in interactions, resulting in improved sales. This study illustrates how AI can be effectively integrated as a complement to human work, filling skill gaps. Such findings underline how intelligent machines can enhance human performance without displacing the roles of human workers. However, long-term implications for the workforce remain unclear.

McWilliams and Randolph (2024) investigate the role of trust in intelligent assistant functions embedded within team collaboration software. These tools support activities such as information retrieval, meeting note-taking, information sharing, trend analysis and recommendation generation. Their findings reveal that a strong transactive memory system within the team positively influences trust in these intelligent assistants. Furthermore, this trust has a positive relationship with knowledge sharing and application within the team, suggesting that successful integration of AI tools requires building knowledge and trust to make them effective resources. By examining the nuances of trust in intelligent assistants, this study underscores the importance of designing these tools to fit naturally into team workflows, enabling workers to engage with them confidently and share knowledge more effectively.

Mazurova and Standaert (2024) study the potential of intelligent machines in assisting with artistic gymnastics judging, focusing on stakeholders' perceptions of automation and augmentation in this domain. Through interviews, they uncover both constraints and opportunities associated with automation and augmentation, specifically in the context of tasks that involve physical precision and professional judgment. Rather than adopting full automation for judgment tasks, which could reduce the richness of human oversight, the authors propose AI augmentation as a more beneficial approach for the long term. This study points to the necessity of designing intelligent systems to serve as tools, suggesting that a more adaptable integration of AI may support and enhance human expertise, especially in complex judgment-based work where experience and context are critical.

Engström *et al*. (2024) investigate how employees interpret and engage with intelligent machines in manufacturing environments. Based on a series of focus groups across four companies, they find that sensemaking of AI differs depending on whether employees focus on the abstract or concrete features of the technology. Specifically, abstract understandings of AI tend to trigger an exploitative learning path, while concrete engagements foster explorative learning and adaptation. This study's findings suggest that the way employees relate to AI influences how they learn and adapt to its introduction in the workplace. It highlights the importance of actively involving employees in understanding and shaping the role of intelligent machines, as this can encourage meaningful adaptation to shared work environments.

Öcal and Crowston (2024) [1] conduct a computer-aided textual analysis of social media posts on Reddit to explore public perceptions of intelligent machines and their impact on the future of work. They identify three central themes within the overarching "New World of Work" frame: societal impacts of AI, augmentation versus substitution of human tasks and job loss. Interestingly, although users acknowledge potential negative outcomes, the overall sentiment skews slightly positive, with curiosity being the most commonly expressed emotion.

This study reveals a nuanced public perception of intelligent machines, where curiosity and cautious optimism are more prominent than fear, at least among Redditors. It suggests that people are not only aware of the changes AI may bring but are also ready to explore these new workplace dynamics with a balanced perspective.

Hajiheydari and Delgosha (2024) examine the resources and demands associated with algorithmic management in gig work, a field where intelligent machines increasingly govern task distribution, evaluation and worker engagement. Through interviews, they identify algorithmic compensation, work autonomy and information sharing as job resources that positively influence worker engagement. Conversely, factors such as job insecurity, unsupportive algorithmic interactions and perceived algorithmic injustice contribute significantly to burnout, with specific resources moderating these negative impacts. Their study underscores the dual nature of algorithmic management: while it offers the potential for enhancing worker autonomy, it also introduces demands that can lead to burnout if not carefully managed. This work calls attention to the need for well-designed algorithmic systems that prioritize worker well-being, which aligns with broader goals for intelligent machines to serve as supportive, rather than purely managerial, tools.

Finally, Alter (2024) provides a framework of eight principles for analyzing and evaluating intelligent machines within work systems, which he argues is essential for understanding and designing effective human-machine interactions. His principles include identifying the intelligent machine's purpose, defining its role and responsibilities within the broader work system, characterizing its degree of "smartness" and assessing its mode of interaction with human participants. Additionally, he suggests examining how human agency and workarounds can generate deviations from the expected performance and considering ways in which the machine augments or limits the work system's capacity. Each principle offers specific options and alternatives, guiding stakeholders to consider the complex ways in which intelligent machines interact with human roles. By advocating for a detailed evaluation, this framework supports the notion that intelligent machines should be designed to enhance work systems in ways that respect and utilize human expertise.

In addition to these seven papers, this issue includes an eighth related regular paper by Verma *et al*. (2024) on the effects of AI-related stress in Indian workplaces. They find that AI systems perceived as accountable, transparent and responsible correlate with self-reported innovative work behaviors, which are in turn related to perceived performance improvements. Conversely, perceptions of complexity and uncertainty associated with AI are linked to work exhaustion, though exhaustion does not relate to reduced performance. These findings highlight how novel AI systems can introduce new forms of stress that may challenge workers' endurance and innovativeness, underscoring the importance of designing these systems to support rather than undermine human resilience.

In summary, the papers in this special issue present a diverse array of research that collectively illuminates the transformative potential of intelligent machines in the workplace. From enhancing human capabilities and fostering knowledge sharing to navigating the challenges of algorithmic management, each paper contributes to our understanding of the evolving relationship between information, people and advanced technology. As illustrated through empirical studies and theoretical frameworks, the integration of intelligent machines is not merely about automation; it involves a nuanced understanding of human agency, trust and adaptation in the face of change. By focusing on how intelligent machines can augment human work rather than replace it, these contributions support a broader vision of systems that emphasize productive interactions between humans and intelligent machines for better futures of work.

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Notes

1. This paper was reviewed as a regular submission rather than by the special issue editors.

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