

The Future of Work: How Technology is Reshaping the Workforce

Masa Depan Pekerjaan: Bagaimana Teknologi Membentuk Kembali Tenaga Kerja

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ABSTRACT

This research investigates the impact of technology on the workplace, human factors, human-computer interaction, as well as the characteristics of the future workplace, by considering various related theories such as Technology Dependency Theory, Technology Acceptance Theory, Activity-Information-Decision-Support Theory, and Ergonomics Theory Cognitive. The results show that technology, including automation and artificial intelligence, is having a significant impact on the way work is done, although it also raises concerns about job replacement and worker well-being. The importance of integrating human factors in digital workplace design as well as worker adaptation to technological changes were highlighted. The implications of this research highlight the importance of organizations paying attention to the balance between technological efficiency and worker well-being, while considering the involvement of technology in supporting decision making and information flow to effectively adapt to technological change. However, this research has limitations related to its focus on limited literature in leading journals, as well as limitations in the analysis of the literature available to date. For future research, a holistic and interdisciplinary approach is recommended as well as further empirical research to deepen understanding of the dynamics of interaction between humans and technology in the workplace.

Keywords: technology in the workplace, human factors, human-computer interaction, future workplace, Technology Dependency Theory, Technology Acceptance Theory, Activity-Information-Decision-Support Theory, Cognitive Ergonomics Theory.

ABSTRAK

Penelitian ini menginvestigasi dampak teknologi di tempat kerja, faktor manusia, interaksi manusia-komputer, serta karakteristik tempat kerja masa depan, dengan mempertimbangkan berbagai teori terkait seperti Teori Ketergantungan Teknologi, Teori Penerimaan Teknologi, Teori Aktivitas-Informasi-Keputusan-Dukungan, dan Teori Ergonomi Kognitif. Hasil pembahasan menunjukkan bahwa teknologi, termasuk otomatisasi dan kecerdasan buatan, memiliki dampak signifikan pada cara kerja, meskipun juga memunculkan keprihatinan tentang penggantian pekerjaan dan kesejahteraan pekerja. Pentingnya integrasi faktor manusia dalam desain tempat kerja digital serta adaptasi pekerja terhadap perubahan teknologi menjadi sorotan utama. Implikasi penelitian ini menyoroti pentingnya organisasi memperhatikan keseimbangan antara efisiensi teknologi dan kesejahteraan pekerja, sambil mempertimbangkan keterlibatan teknologi dalam mendukung pengambilan keputusan dan aliran informasi untuk beradaptasi dengan perubahan teknologi secara efektif. Namun, penelitian ini memiliki keterbatasan terkait fokus pada literatur yang terbatas pada jurnal-jurnal terkemuka, serta pembatasan pada analisis literatur yang tersedia hingga saat ini. Untuk penelitian mendatang, disarankan pendekatan holistik dan interdisipliner serta penelitian empiris lebih lanjut untuk memperdalam pemahaman tentang dinamika interaksi antara manusia dan teknologi di tempat kerja.

Kata Kunci: teknologi di tempat kerja, faktor manusia, interaksi manusia-komputer, tempat kerja masa depan, Teori Ketergantungan Teknologi, Teori Penerimaan Teknologi, Teori Aktivitas-Informasi-Keputusan-Dukungan, Teori Ergonomi Kognitif.

1. Introduction

Technology has been a key driver in transforming the work landscape, influencing how jobs are performed, and impacting the need for new skills in the workplace. A study by Johnson et al. (2021) highlighted that the use of Big Data and Artificial Intelligence (AI) has significantly impacted various industries, necessitating the development of a workforce roadmap to gain a competitive advantage. Furthermore, research by Schulte et al. (2019) emphasized the need for an expanded focus on Occupational Safety and Health (OSH) to address changes in the workforce that will challenge traditional OSH systems. This aligns with findings by (Ramsden et al., 2022), indicating that digital solutions can enhance the capabilities of health workers in rural areas.

On the other hand, Getha-Taylor (2019) discussed efforts to revitalize public services to enhance the middle class, while also facing challenges in public workforce management. Meanwhile, Långstedt (2021) highlighted how core values and susceptibility to automation will play a role in future jobs. Therefore, through technology integration, skill adaptation, and changes in work values, the future of work influenced by technology will require rapid and sustainable workforce adaptation to remain relevant and productive in an ever-changing work environment. Technological advances, particularly in artificial intelligence (AI), automation, and robotics, have significantly impacted the world of work. These advancements have not only revolutionized the nature of work by automating tasks but have also created new opportunities, enhanced creativity, and improved efficiency (Masriadi et al., 2023). The interaction between technology and humans in the workplace has become increasingly complex, necessitating a reevaluation of the relationship between emerging technologies and human workers (Cheon et al., 2021). As communication technologies advance, the future workforce is expected to be more productive and capable than ever before (Attaran et al., 2019).

The rapid pace of technological innovation is transforming workplaces, presenting both opportunities and challenges. While technology offers benefits such as increased productivity and efficiency, it also introduces complexities that organizations need to navigate for harmonious and productive interactions between humans and technology (Moats, 2021). Workplace design has become a strategic resource in the face of global competition and technological advancements, emphasizing the importance of firm resources in the evolving workplace landscape (Schmid, 2020).

Moreover, the impact of technology overload on employees has been a subject of study, highlighting the ubiquitous work environment created by information and communication technologies (Rasool et al., 2022). The digital workplace presents advantages and challenges for organizations, impacting not only individual employees but entire organizational structures (Raković et al., 2022). As technology continues to evolve, the dark side of technology overload on salespeople has been examined, emphasizing the need for understanding and managing the implications of rapid technological change in the workplace (Delpechitre et al., 2019). In conclusion, the evolving landscape of work driven by technological advances necessitates a nuanced understanding of the interactions between humans and technology. While technology offers immense potential for enhancing work processes and outcomes, organizations must address challenges such as information overload, digital transformation, and the impact of technology on employee well-being to ensure a productive and harmonious work environment.

In this complex context, an emerging research question is how the interaction between technology and human factors in the workplace influences the dynamics of the modern work environment. This question not only seeks to explore these interactions, but also aims to deepen the understanding of how humans and technology influence each other in the workplace context. This research aims to examine and analyze previous research findings regarding the interaction between technology and human factors in the workplace. Thus, the

aim of this research is to provide deeper insight into how technology can act as a tool for humans in the workplace, as well as identify obstacles that may arise in efforts to ensure effective collaboration between humans and machines.

This research has significant implications in contemporary developments in the world of work. Through analysis of previous findings, this research is expected to provide a more comprehensive understanding of how technology can be applied optimally to increase human productivity and well-being in the work environment. Additionally, by identifying the barriers that may arise in collaboration between humans and machines, this research is expected to provide a strong foundation for the development of more adaptive workplace designs and more inclusive management practices. Thus, it is hoped that the results of this research can provide a significant contribution in efforts to understand and optimize the relationship between technology and human factors in the workplace in this modern era.

2. Research Methods

This research adopts a systematic literature review method, an approach that has proven effective in summarizing important findings from previous studies related to the research topic. This method provides a systematic framework for collecting, evaluating, and synthesizing relevant literature, thereby enabling researchers to gain a more comprehensive understanding of the interactions between technology and human factors in the work environment. By taking this approach, research can present a more detailed and comprehensive picture of how technology influences human behavior and performance in the workplace, as well as how human factors influence the acceptance and application of technology.

This systematic literature review approach also allows identification and critical assessment of the weaknesses and strengths of existing studies, thereby enabling researchers to make more accurate and reliable conclusions. Thus, this research can make a valuable contribution to our understanding of the complexity of interactions between humans and technology in the workplace. In addition, by presenting a comprehensive overview of previous findings, this research can also provide a strong basis for further research development and the development of best practices in utilizing technology to improve human performance and welfare in the work environment.

This research relies on primary data sources originating from academic databases, which include but are not limited to platforms such as Scopus, Web of Science, and online research repositories such as Google Scholar. The selection of data sources is based on the aim of ensuring accessibility to various scientific articles, journals, conferences and academic literature that are relevant to the research topic. This decision reflects an effort to gain a comprehensive understanding of the interaction between technology and human factors in the workplace by relying on quality and reliable data.

The use of academic databases allows researchers to carry out structured and detailed searches of relevant literature, as well as to carry out in-depth analysis of existing findings. In addition, this data source also facilitates efforts to verify the validity and reliability of the information found, thereby ensuring that the conclusions resulting from this research are based on strong and justifiable evidence. Thus, the use of academic databases as the main data source in this research reflects a commitment to maintaining high scientific standards and producing valuable contributions in the field of interaction between humans and technology in the work environment.

In the process of this research, strict inclusion and exclusion criteria have been established to filter literature relevant to the research topic. The included literature should clearly focus on the interaction between technology and human factors in the work environment. Predetermined inclusion criteria include publications in leading international journals, empirical studies that have a strong methodology, and a thorough literature review

that is relevant to the research topic. Thus, the selected literature must meet certain predetermined quality standards.

Meanwhile, literature that is not directly related to the research topic or does not meet the predetermined inclusion criteria will be excluded from the analysis. This screening process aims to ensure that only the most relevant and high-quality literature is used in this research, thereby ensuring the accuracy and reliability of the findings produced. Thus, these strict inclusion and exclusion criteria are an important foundation in ensuring that this research can make a meaningful contribution to deepening understanding of interactions between humans and technology in the workplace.

This data analysis procedure begins with a literature filtering and selection stage, which is carried out based on predetermined inclusion and exclusion criteria. Once the relevant literature has been selected, important information such as the main findings, research methodology used, and practical implications of each study will be systematically extracted. The extracted data will then be synthesized and thoroughly analyzed to identify patterns, trends and conclusions relevant to the research questions asked.

Through this approach, researchers can present a more comprehensive understanding of the interaction between technology and human factors in the work environment. By analyzing findings from various relevant studies, this research can reveal various perspectives and points of view that can provide deeper insight into the complex dynamics between humans and technology in the workplace. In addition, this approach also allows researchers to identify practical implications that can be applied in the context of policy development, workplace design, and more effective management practices. Thus, this systematic data analysis procedure is key in ensuring that research results can make a meaningful contribution to the understanding and development of interactions between humans and technology in the modern work environment.

3. Results and Discussions

3.1. Definition of Technology in the Workplace

Technology in the workplace encompasses a wide array of advancements such as automation, artificial intelligence (AI), and virtual reality (VR). These technologies have been transforming traditional work environments significantly. Automation, a key aspect of workplace technology, aims to reduce human intervention ("Opportunities and Challenges for Implementing Automation among Selected SMEs of Food Manufacturing Industry", 2019). It has been a feature of workplaces since the industrial revolution (Danaher & Nyholm, 2020). The advent of AI has further revolutionized workplaces, with its ability to recognize performance patterns and estimate employee morale (Bibi, 2019). AI-driven workplace automation explicitly aims to replace human labor with artificial labor (Burley & Eisikovits, 2022).

The impact of these technologies on workplaces is profound. They have led to concerns about job automation and the potential displacement of human workers (Dahlin, 2019). The 4th Industrial Revolution has introduced technologies that blur the boundaries between work and personal life, leading to employees being constantly connected to work responsibilities (Coldwell, 2019). Workplace automation has been associated with social and political upheavals (Tigard, 2021). Moreover, the implementation of AI technologies in workplaces has implications for business communication (Getchell et al., 2022).

As workplaces evolve with technology, there is a growing need for employees to upskill to adapt to these changes (Jaiswal et al., 2021). The shift towards automation has prompted research interest in understanding its impact on workplace behavior and contexts (Qi, 2023). Workplace automation is not just about technology; it also involves psychosocial hazards that can affect workers' health and well-being (Cheng et al., 2020). Additionally, the governance of AI-induced risks at work is crucial for ensuring decent work conditions and fair remuneration

(Hassel & Özkiziltan, 2023). In conclusion, technology in the workplace, including automation and AI, is reshaping how work is done. While these advancements bring efficiency and innovation, they also raise concerns about job displacement, worker well-being, and the need for upskilling. Understanding the implications of these technologies on workplace dynamics is essential for organizations to navigate the changing landscape of work effectively.

3.2. Definition of Human Factors in the Workplace

Human factors in the workplace encompass the critical elements of human behavior, capabilities, limitations, and interactions within the work environment. As technology continues to reshape the workforce, the integration of human factors becomes increasingly vital. Studies have highlighted the importance of incorporating human factors into digitized workplaces to address the challenges posed by Industry 4.0 (Obermayer-Kovács, 2022). This integration involves understanding how well-prepared both employees and organizations are for the digitization challenges that come with technological advancements (Obermayer-Kovács, 2022).

At an individual level, factors such as technology adoption, attitudes towards technological change, skills development, workplace resilience, and well-being play a crucial role in facilitating effective digital transformation among employees (Trenerry et al., 2021). Organizations need to consider these factors to ensure a smooth transition towards digitalization and to enhance workforce readiness for the future of work.

The future of work is closely tied to the ability of workforces to adapt and be flexible in the face of technological advancements. Adaptive and flexible minds are becoming essential skills for employability in the era of the Fourth Industrial Revolution (Singaram & Mayer, 2022). As automation and intelligent technologies like AI reshape the workforce, discussions around the impact of these changes on values, skills, and susceptibility to automation are gaining prominence (Långstedt, 2021).

Moreover, the concept of a metaverse in the virtual workplace is emerging, emphasizing the influence of individual, team, and organizational factors alongside contextual moderators on its implementation (Šímová et al., 2023). This shift towards virtual environments necessitates a deep understanding of human-computer interactions and the factors that influence successful integration. In conclusion, as technology continues to advance and reshape the workforce, understanding and integrating human factors into the workplace are crucial for ensuring successful digital transformation and preparing employees for the future of work.

3.3. Definition of Human-Computer Interaction

Human-Computer Interaction (HCI) in the context of the future of work is a critical area that is evolving with technological advancements. HCI involves the study of how people interact with computers and to what extent technology can be designed to facilitate seamless interactions. The future of work, influenced by factors such as automation, artificial intelligence, and digitalization, is reshaping the workforce landscape (Ahmad, 2019; Långstedt, 2021). As technology continues to advance, the integration of HCI principles becomes increasingly important to ensure that human workers can effectively collaborate with machines and systems (Paidakula, 2021; Madakam et al., 2019).

The concept of implicit HCI, as described by , highlights a user-friendly approach where users do not need to focus extensively on the interaction process itself, indicating a seamless and intuitive interaction experience (Ou et al., 2022). This aligns with the future direction of work, where technology is expected to be more intuitive and user-centric to enhance productivity and efficiency in various industries (Fotis, 2022; Singaram & Mayer, 2022).

Moreover, the impact of new technologies, such as Robotic Process Automation (RPA), is transforming traditional work processes by automating tasks like payroll, recruitment, and

data management (Madakam et al., 2019). This shift towards automation underscores the importance of HCI in designing interfaces that are not only efficient but also user-friendly to accommodate the changing nature of work environments.

As organizations navigate the challenges posed by digitalization and Industry 4.0, the role of HCI in ensuring usability and seamless human-machine interactions becomes paramount (Obermayer-Kovács, 2022; Rey et al., 2020). By integrating human factors into digitized workplaces, companies can better prepare their workforce for the challenges and opportunities presented by technological advancements (Obermayer-Kovács, 2022). In conclusion, the future of work is intricately linked with advancements in technology and the evolution of HCI. As organizations strive to optimize workforce capabilities and adapt to digital transformations, the principles of HCI will play a pivotal role in shaping the interactions between humans and machines in the workplace.

3.4. Definition and Characteristics of the Future Workplace

The future workplace is anticipated to be a dynamic environment influenced by factors such as changing business needs, the integration of new technologies, sustainability concerns, and resource optimization (Bröchner et al., 2019). To excel in this evolving landscape, workplaces must address issues like absenteeism and presenteeism by effectively managing job demands and ensuring job security (Idris et al., 2023). Additionally, seminal works like Zuboff's "In the Age of the Smart Machine" have significantly impacted perspectives on work organization and technology (Torraco & Lundgren, 2019).

In managing future workplaces, a transdisciplinary approach is crucial to address complex challenges related to productivity, office dynamics, and strategic management (Appel-Meulenbroek & Danivska, 2021). Employability plays a vital role in shaping the workforce, emphasizing individuals' capacity to contribute to workplace collectives and adapt to changing demands (Kahn & Lundgren-Resentera, 2021). Education, environmental considerations, and entrepreneurial skills are highlighted as key elements in defining the modern workplace (Dinning, 2023).

Technological advancements are expected to reshape labor market needs, influencing the skills and knowledge required in various sectors (Bachari-Lafteh & Harati-Mokhtari, 2021). Workplace democracy is suggested to have spillover effects, fostering democratic attitudes and enhancing political participation through self-efficacy (Rybnikova, 2022). Organizational citizenship behavior and resilience are identified as factors that positively influence workplace functioning and employee well-being (Wen-yi, 2020; Mann et al., 2021).

Furthermore, workplace challenges such as cyberbullying, ostracism, and gender disparities continue to present obstacles that require attention for a more inclusive and supportive work environment (D'Souza et al., 2019; Manninen et al., 2022; Hanek & Garcia, 2022). Workplace well-being is associated with factors like techno-stress, workplace spirituality, and the management of workplace gossip, underscoring the importance of addressing psychological states and social dynamics in future workplaces (Popescu et al., 2020; Freer & Robertson, 2020; Begemann et al., 2021). In conclusion, the future workplace is a complex ecosystem where adaptability, technology integration, sustainability, and human factors intersect. By comprehending and addressing these multifaceted aspects, organizations can establish environments that foster productivity, well-being, and inclusivity among employees.

3.5. Technology Dependency theory

Trust in Technology Theory, also known as Technology Dependency Theory, examines the relationship between individuals and their reliance on technology (Semnani-Azad et al., 2019). This theory is particularly relevant in understanding how technology is reshaping the workforce (Ahmad, 2019). With the continuous advancement of technology, the future of work is being significantly influenced by automation, digitization, and the demand for new skill sets

(Krishnamoorthy & Keating, 2021; Långstedt, 2021; Cummins et al., 2019). The overuse of electronic platforms has been observed to diminish face-to-face interactions, potentially affecting the development of soft skills among the future workforce (Ahmad, 2019).

The workforce is encountering challenges related to readiness for technological changes, with estimates indicating that a substantial number of employees may require retraining or replacement due to automation and digitization (Krishnamoorthy & Keating, 2021). Organizations are increasingly acknowledging the significance of ensuring that their employees are digitally proficient and investing in technologies that can adapt to the evolving digital landscape (Madzimure & Baloyi, 2022). Success in future work settings is progressively reliant on the workforce's capacity to acquire new skills and competencies (Frady, 2021).

As the workforce evolves, the necessity for adaptable and flexible minds is becoming essential for employability (Singaram & Mayer, 2022). Nevertheless, challenges emerge from the lack of comprehension regarding how technologies like Robotic Process Automation (RPA) and the workforce can effectively collaborate (Lakay & Mlambo, 2022). Engineers' intentions to utilize data exchange methods are influenced by perceptions of risk and trustworthiness (Avşar et al., 2022).

In conclusion, Technology Dependency Theory plays a crucial role in elucidating how trust in technology impacts the future of work. As organizations navigate the transformations brought about by automation and digitization, ensuring workforce readiness and addressing skill gaps are becoming increasingly critical. Trust in technology, coupled with the ability to adapt to new technologies, will be pivotal factors in shaping the future workforce.

3.6. Technology Acceptance Theory

Technology Acceptance Theory, particularly the Technology Acceptance Model (TAM), plays a crucial role in understanding how individuals perceive and adopt new technologies. The model has been extensively used to assess the acceptance of various technologies, including online purchasing (Kandambi & Wijayanayaka, 2020), technologies in agriculture (Bilali et al., 2021), IoT in different regions (Albeshir, 2019), and online learning environments (Gunasinghe et al., 2019). These studies highlight the importance of theoretical models like TAM, Unified Theory of Acceptance and Use of Technology (UTAUT), and others in explaining technology acceptance among different user groups.

The future of work is being significantly influenced by technological advancements, as seen in the increasing acceptance of technology applications in various fields such as financial research (Shuhidan et al., 2019), human resources management (Wisseemann et al., 2022), and healthcare innovation (Fotis, 2022). Organizations are recognizing the need to adapt to technological changes to remain competitive and efficient, as highlighted in studies focusing on the impact of digital workforce on organizational performance Madzimure & Baloyi (2022) and the need for middle-skill workers to develop new skills for career sustainability (Frady, 2021).

As the workforce evolves, there is a growing emphasis on preparing individuals for the future of work through education and skill development (Ahmad, 2019), including problem-solving skills Cummins et al. (2019) and digital literacy (Madzimure & Baloyi, 2022). The Fourth Industrial Revolution is reshaping organizational cultures and work environments, presenting both opportunities and challenges for economies and societies (Singaram & Mayer, 2022). Additionally, the mining industry is experiencing transformations through new technologies that enhance productivity and workplace environments (Lööv et al., 2019).

The integration of new technologies like mixed reality and sensing technologies in industries such as construction Ogunseiju et al. (2021) is driving the demand for a technically skilled workforce capable of leveraging these innovations effectively. However, these changes also raise concerns about occupational safety and health, emphasizing the need for an expanded focus on ensuring worker well-being in the face of technological advancements (Schulte et al., 2019).

In conclusion, the intersection of Technology Acceptance Theory and the future of work underscores the importance of understanding how individuals and organizations perceive and adopt technology to navigate the evolving landscape of work effectively. By leveraging theoretical models and empirical research, stakeholders can better prepare for the challenges and opportunities presented by technological advancements in the workforce.

3.7. Activity-Information-Decision-Support Theory

Activity Theory-Information-Decision-Support (ATIDS) is a framework that examines how information influences decision-making processes within organizations. In the context of the future of work and how technology is reshaping the workforce, ATIDS becomes crucial in understanding how technological advancements impact decision support systems and information flow within organizations (Hosseini, 2020; Elyyani et al., 2022; Madzimure & Baloyi, 2022; Liu et al., 2021).

As organizations transition towards automation and digitalization to enhance performance and adapt to changing workforce dynamics, decision support systems play a vital role in facilitating efficient decision-making processes (Milov, 2019; Elyyani et al., 2022; Madzimure & Baloyi, 2022). These systems leverage technologies like artificial intelligence, microservices, and rough set analysis to provide middle managers with the necessary information for problem-solving and decision-making (Elyyani et al., 2022; Zhu et al., 2022). Additionally, the integration of cloud services in decision-making processes is highlighted as a strategic move for enterprises embracing the digital era (Liu et al., 2021).

Moreover, the impact of big data and artificial intelligence on industries necessitates the development of a workforce roadmap to ensure businesses can leverage these technologies effectively (Johnson et al., 2021). This roadmap involves forecasting technological changes, identifying necessary workforce skills, and providing recommendations for workforce development to gain a competitive advantage (Johnson et al., 2021).

Furthermore, as the workforce undergoes significant transformations due to technological advancements, reskilling becomes imperative to meet the demands of the evolving job market (Drake & Kauppinen, 2021). The World Economic Forum predicts that new technologies will revolutionize over a billion jobs globally in the next decade, emphasizing the need for workforce reskilling initiatives (Drake & Kauppinen, 2021). In conclusion, the convergence of technology and the workforce necessitates a deep understanding of decision support systems, information flow, and the role of technology in shaping the future of work. ATIDS provides a valuable framework to analyze these dynamics and adapt organizational decision-making processes to the changing technological landscape.

3.8. Cognitive Ergonomics Theory

Cognitive Ergonomics Theory is a critical component in shaping the future of work, particularly in the context of how technology is transforming the workforce. Cognitive ergonomics involves the application of knowledge about mental behavior to ensure that human-product interactions are in line with human cognitive abilities and limitations (Chen et al., 2021). This field falls under the broader discipline of ergonomics, which encompasses cognitive, organizational, and physical aspects. Cognitive ergonomics specifically focuses on mental processes such as mental workload, work stress, decision-making, and communication, all of which have a significant impact on employee well-being (Maharjan, 2024).

In work environments, cognitive ergonomics is essential for optimizing human performance and well-being. It involves understanding the interactions between humans and systems to improve overall system performance and human well-being (Sudiajeng et al., 2022). By adhering to cognitive ergonomics principles, organizations can develop tasks, jobs, products, and environments that promote worker safety, health, and productivity (Dennerlein et al., 2020).

Furthermore, cognitive ergonomics is closely linked to fields like computer science and artificial intelligence. It influences the design and assessment of human-computer interaction systems to ensure that interfaces are user-friendly and effective (Chen et al., 2019). Additionally, cognitive ergonomics contributes to collision investigation methodologies by focusing on end-user cognition and behavior to analyze incidents (Hamim et al., 2022).

As the workforce evolves with the integration of big data, artificial intelligence, and new technologies, the significance of cognitive ergonomics becomes even more pronounced. Organizations must adapt to these changes by reshaping skills and competencies, as emphasized in discussions on vocational training and workforce development (Drake & Kauppinen, 2021; Johnson et al., 2021). Embracing cognitive ergonomics principles enables businesses to navigate the challenges posed by technological advancements and create environments that support both worker well-being and organizational performance.

4. Conclusions

In studying technology in the workplace, human factors, human-computer interaction, definition and characteristics of the future workplace, as well as related theories such as Technology Dependency Theory, Technology Acceptance Model, Activity-Information-Decision-Support Theory, and Cognitive Ergonomics Theory, this research has revealed a variety of important findings. From the results of the discussion, it can be concluded that technology in the workplace, including automation and artificial intelligence (AI), has a significant impact on the way work is done. Although technology brings efficiency and innovation, there are also concerns about job replacement and worker well-being. The importance of integrating human factors in digital workplace design and worker adaptation to technological changes are also highlighted in this research.

The implication of these findings is the importance for organizations to pay attention to the balance between technological efficiency and worker welfare. Organizations need to take into account factors such as workers' digital skills and readiness, as well as the psychosocial impact of automation and AI in the workplace. The involvement of technology in supporting decision making and information flow is also key in ensuring organizations can adapt to technological changes effectively.

However, this research also has limitations. For example, research focuses only on literature published in leading journals, which can ignore alternative perspectives. In addition, this research is limited to an analysis of the literature available to date, so the possibility of new findings in the future cannot be ignored.

For future research, a more holistic and interdisciplinary approach is needed in understanding interactions between humans and technology in the workplace. Further empirical research is also needed to test the validity and generalisability of the theoretical findings revealed in this literature review. In this way, a deeper understanding of the complex dynamics between technology and human factors in the workplace can be achieved, enabling organizations to plan and manage change more effectively in this digital era.

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