Job Redesign, Automation, and Digital Workforce Competencies in the Twenty-First Century

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ABSTRACT–This study investigates the future of work in the era of artificial intelligence and automation, focusing on implications for job design and digital labor management within human resource management (HRM). Using a qualitative literature review from the past two decades, it synthesizes insights on job redesign, hybrid arrangements, gig work, and remote work. Thematic analysis reveals two central areas, the restructuring of work under AI adoption and the development of future competency frameworks. Findings indicate that automation must be integrated with job design, as task allocation between humans and AI affects workload, learning, and work relationship quality. HRM should act as a strategic partner from the early design stage, utilizing analytics, communication strategies, and manager development to effectively manage a hybrid workforce. The study underscores the need for hybrid competency profiles combining digital proficiency, analytical skills, socioemotional intelligence, and self-management. Employability and dynamic capabilities highlight the necessity of lifelong learning and adaptability. Theoretically, this research contributes to understanding how AI shapes work structures and competency demands. Practically, it guides organizations in redesigning jobs, developing digital workforce competencies, and fostering adaptive learning ecosystems. Collaboration among HR, business leaders, and technology developers is essential to reduce competency gaps and mitigate resistance to technological change.

Keywords: future of work, artificial intelligence, automation, human resource management, hybrid workforce, digital labor, future competencies.

A. INTRODUCTION

Advancements in digital technologies, particularly artificial intelligence and advanced automation, have transformed the ways organizations conduct business processes and manage their workforce. Work that once relied heavily on routine procedures and manual activities is increasingly performed by algorithmic systems, collaborative robots, and machine learning based software. These developments have given rise to new forms of job design that are more fragmented, digitalized, and highly dependent on data (Kitanovikj & Eftimov, 2025). In this context, human resource management cannot be viewed merely as an administrative function, because the quality of workforce management will determine an organization's capacity for adaptation. Questions regarding how work will be defined, who will perform it, and how work relationships will be reconstructed have become crucial themes in management and labor policy discussions.

Labor economics studies show that automation does not simply eliminate all types of work but instead alters the composition of tasks and competencies required (Medina Sotelo et al., 2025). Autor (2015) explains that technology tends to replace work characterized by high routinization and standardization, whereas jobs requiring complex problem solving, rich social interaction, and creativity are more likely to persist or even expand. This shift has led to a growing polarization of job design between high wage, knowledge-based occupations and low wage work that remains difficult to automate. Within this dynamic, the roles of job design and HR policies become increasingly critical in preventing the marginalization of specific worker groups and in facilitating competency transitions (Onnen, 2025).

In line with this development, discussions on the future of work highlight the potential disruption to organizational structures and patterns of employment relationships (Khan et al., 2025). Frey and Osborne (2017) estimate that a significant proportion of occupations in several advanced economies carry a high probability of automation, although the extent of implementation depends on economic,

regulatory, and social factors. Organizations are responding by adopting more agile structural forms, utilizing gig workers, and expanding remote work arrangements through digital platforms. This rapid transition extends beyond mere operational changes, deeply influencing workplace culture and social dynamics. It necessitates a parallel transformation in how cultural values, communication norms, and collaborative practices are adapted for digital and hybrid contexts to maintain social cohesion and organizational identity (Al Hakim, Rojak, & Triono, 2021). This shift also impacts individual workers at a foundational level, reshaping how professional self-identity is formed and how individuals perceive their roles within digitally-mediated teams and networks (Costa, Darmawan, & Isaac, 2022). The combination of human labor and intelligent systems within a single workflow generates what is commonly referred to as a hybrid workforce, a configuration in which humans and AI complement each other in task execution. This transformation requires new approaches to designing roles, workflows, and performance management systems that are not only culturally intelligent and socially sustainable, but also supportive of the evolving processes of professional identity construction in an increasingly digital and fluid work environment.

Changes in job design and employment relations involve substantial psychological and social dimensions. Workers face pressures to continuously update their competencies, recalibrate professional identities, and manage career uncertainties (Jewel & Mouli, 2025). For human resource practitioners, the challenge extends beyond simply filling vacancies. It encompasses redirecting job design, formulating future oriented competency development policies, and maintaining the quality of employment relationships within increasingly distributed work arrangements (Arifin & Darmawan, 2021; Yıldız & Nur, 2024). Thus, discussions on the future of work, automation, and the role of HRM cannot be separated from efforts to understand how organizations integrate technology, people, and new work structures in a sustainable manner.

The first issue concerns the gap between the pace of automation adoption and the preparedness of job design in many organizations. Parker and Grote (2020) emphasize that automation is often implemented with a primary focus on technical efficiency, while job design aspects such as

autonomy, task variety, and learning opportunities receive insufficient attention. As a result, workers encounter highly monitored work, diminished task meaning, or demands for new competencies without adequate development support. This narrow, efficiency-driven approach mirrors challenges observed in other sectors undergoing digital transformation, such as healthcare, where the implementation of artificial intelligence can risk prioritizing system optimization over the enhancement of human-centered care and professional practice if not carefully managed (Khayru, 2022). Within HRM, this is reflected in strategies that prioritize labor cost reduction rather than the establishment of a healthy work ecosystem for human-AI collaboration.

The second issue arises from the growing prevalence of precarious forms of work, particularly in gig and digital platform environments. Kalleberg and Vallas (2018) demonstrate that the expansion of nonstandard work, short term contracts, and platform-based jobs raises serious questions about job security, social protection, and long-term career quality. In hybrid workforce configurations, many workers are only loosely connected to organizations and fall outside the coverage of formal HRM policies. This situation complicates efforts to pursue sustainable competency development and weakens social cohesion within the workplace, thereby directly conflicting with the objectives of strategic, digital-based HR development policies aimed at fostering sustainable collaborative innovation through a stable and engaged talent pool (Mardikaningsih et al., 2024).

The third issue relates to the strategic role of HRM, which is often insufficiently consolidated within discussions on digital transformation. Many decisions concerning automation, AI system design, and organizational restructuring are driven by information technology or finance functions, while HRM enters at the final stage as an administrative executor. Yet Boxall and Purcell (2016) argue that a strong HRM strategy is a prerequisite for building sustainable competitive advantage, particularly through job design, reward systems, and competency development. This late or marginal involvement of HRM can exacerbate internal inequities and erode trust within the workforce, a dynamic akin to how broader societal digital divides and the spread of misinformation can undermine participation and cohesion in local communities (Issalillah &

Hardyansah, 2022). Without early HR involvement in the design of automation and job redesign processes, there is a heightened risk that technological solutions will generate worker resistance, perceptions of injustice, and declining organizational commitment.

The topic of the future of work, automation, and the role of HRM becomes increasingly relevant as organizations across sectors undergo large scale digital transformations. Decisions regarding the implementation of AI and automation are no longer exploratory but have entered operational phases that directly influence the structure of employment opportunities and task distribution. Structured scholarly discussions on how work should be redesigned, how hybrid workforce configurations should be managed, and how new forms of employment relationships should be constructed must be strengthened with theoretical foundations and contemporary empirical evidence. Without systematic inquiry, policy interventions risk replicating older patterns narrowly oriented toward efficiency while overlooking the quality of work experiences and the sustainability of workers' careers.

Moreover, the post COVID 19 period has accelerated the acceptance of remote work and flexible work models, thereby expanding the array of combinations between technology, physical workspaces, and temporal arrangements. In this context, HRM holds a strategic position in formulating policies that align organizational needs, technological capacities, and worker aspirations. Scholarly examinations of these themes provide a foundation for researchers and practitioners to comprehend emerging patterns of change, identify gaps in the literature, and formulate conceptual frameworks to guide future HRM interventions.

This study aims to develop a systematic literature review on the future of work with an emphasis on job redesign, automation, and the strategic role of HRM in managing hybrid workforces, gig work, and remote work arrangements. Theoretically, the study seeks to articulate the relationships among AI, job design, and future competencies within a strategic HRM framework. Practically, the findings are expected to serve as a reference for policymakers and HR practitioners in designing job structures, competency development programs, and employment relationship arrangements that align with the demands of the digital era.

B. METHOD

This scholarly inquiry begins by outlining the urgency of developing a conceptual mapping that can elucidate the relationships among the future of work, automation, and the role of human resource management (HRM) in managing the dynamics of the modern workforce. The study employs a qualitative literature review to construct a comprehensive synthesis of these three domains through the formulation of a clearly structured analytical focus. This focus integrates discussions on job design, the application of artificial intelligence and automation, and the orientation of strategic HRM policies in the management of digital labor. The literature search was conducted in accordance with the principles of systematic literature reviews, which emphasize clarity of research questions, transparency in selection procedures, and standardized reporting, as recommended by Booth et al. (2016) and Snyder (2019). The search process was carried out using several major databases, including Scopus, Web of Science, and Google Scholar, with keywords such as "future of work", "job design and automation", "AI in HRM", "hybrid workforce", "gig work", and "remote work HRM", applied both individually and in combination through Boolean operators. The publication period was restricted to the last two decades to ensure alignment with the trajectory of contemporary digital technological developments relevant to the topic.

Source selection was guided by inclusion criteria designed to safeguard the relevance and credibility of the literature used. Eligible publications consisted of scholarly works appearing in reputable academic journals or books, written in English or Indonesian, and providing explicit discussion of the relationship between artificial intelligence or automation and job design, organizational structure, or HRM practices. Sources that addressed technology in isolation from human work dynamics, or HRM studies that did not incorporate technological transformation, were excluded from the corpus. The screening process was conducted in stages, beginning with an assessment of titles and abstracts, followed by full text review to confirm substantive relevance. This multi stage selection procedure adheres to the principles of transparency and methodological justification

in literature studies as advocated by Booth et al. (2016); Snyder (2019).

The data obtained from the selected publications were analyzed using a thematic synthesis approach. The initial stage involved open coding of text segments related to the central themes of the study, including patterns of job redesign, forms of hybrid workforce, the implications of gig work and remote work, the contribution of HRM to digital transformation, and future competency frameworks. Thematic analysis techniques as described by Braun and Clarke (2006) were employed to identify recurring patterns, cluster codes into higher order themes, and construct a coherent conceptual narrative. All processes of coding and theme development were documented systematically in order to maintain consistency and traceability of the analysis. Furthermore, the principles of thematic synthesis as articulated by Thomas and Harden (2008) were applied to integrate findings across studies, transforming descriptive themes into more abstract analytical themes and thereby building a new interpretive framework that is pertinent to the role of HRM and the future of work.

By integrating these stages, the study is expected to broaden academic understanding of how the relevant body of literature can be synthesized systematically to produce a meaningful conceptual mapping that informs the development of job design and HRM strategies in the era of automation.

C. RESULTS AND DISCUSSION

The Strategic Role of HRM in Job Redesign in the Era of AI and Automation

The profound shifts introduced by artificial intelligence and automation in task structures require HRM to transition from an administrative orientation to a role that is explicitly strategic. Within the framework of strategic human resource management, Becker and Huselid (2006) assert that HRM contributes to organizational performance when human resource policies and practices are aligned with long term business priorities. In the digital era, such priorities encompass the organization's capability to redesign work in ways that correspond with the application of intelligent technologies and the readiness of the workforce. This implies that decisions regarding the types of tasks delegated to AI systems, the forms of human machine collaboration, and emerging reporting

structures cannot be determined solely from a technological perspective (Khan et al., 2025). HRM must ensure that these decisions take into account the quality of job design, feasibility of workload distribution, opportunities for learning, and perceptions of fairness among workers directly affected. The integration of technology strategies and job design thus becomes a central arena in which HRM functions as a strategic managerial partner (Kitanovikj & Eftimov, 2025).

Lepak and Snell (2002) explain that HRM functions may assume several roles, ranging from administrative service provision to strategic advisorship involved in corporate level decision making. In the context of digital transformation, the advisory role becomes particularly salient because line managers and senior leaders require a clear understanding of the implications of automation decisions for job structures and competency portfolios (Medina Sotelo et al., 2025). This strategic understanding must also extend to emerging legal and contractual dimensions of digital work, such as the validity and implications of agreements facilitated or generated by AI systems issues that are now subject to juridical scrutiny (Maulani et al., 2023; Khuan, 2025). HRM must therefore provide scenario analyses illustrating how combinations of human labor and AI will influence workforce size, contract types, and career pathways. At the same time, HRM must formulate transparent change communication policies that help employees understand the rationale for job redesign and prepare themselves for role adjustments (Jewel & Mouli, 2025). Without HRM involvement during the design phase, organizations risk creating work configurations that are difficult to implement, heighten anxiety, weaken the quality of employment relationships, and potentially expose the firm to unanticipated legal risks.

Research on technology and organizations shows that digitalization reshapes work structures fundamentally. Cascio and Montealegre (2016) demonstrate that advanced information technologies alter coordination, communication, and monitoring processes, thereby shifting spatial and temporal boundaries of work. HRM must respond to these changes with job designs that leverage technological flexibility while preserving clarity of roles and accountability. In remote work environments supported by digital collaboration systems, HRM must revise job descriptions, performance indicators, and

feedback mechanisms to reflect distributed work patterns. In a hybrid workforce comprising permanent employees, gig workers, and AI agents, HRM must delineate roles and responsibilities clearly to support smooth collaboration, reduce ambiguity, and facilitate achievement of organizational goals (Kim et al., 2024).

Developments in e-HRM illustrate how technology can strengthen HRM functions in job redesign processes. Strohmeier (2009) categorizes the consequences of e HRM into dimensions of efficiency, service quality, and transformational potential. In relation to the future of work, the transformational dimension is critical because it concerns the ability of e HRM and analytical systems to provide data on workload, collaboration patterns, and emerging competency requirements triggered by automation (Onnen, 2025). This data-driven approach mirrors broader trends in digital transformation, where the integration of advanced technologies such as Big Data and Artificial Intelligence is fundamental for optimizing complex systems and decision-making processes (Putra & Arifin, 2021). Using such data, HRM can identify work areas suitable for human–AI hybridization, assess risks of overload or underutilization, and design relevant training interventions (Soliani et al., 2024). Well designed e HRM systems enable HRM to shift from administrative processing to evidence-based decision making in job design (Kitanovikj & Eftimov, 2025), thereby applying a principle of systemic optimization that is central to modern, technology-driven management paradigm.

Research on e HRM also reveals that organizational outcomes often diverge from the original intentions underlying technology implementation. Parry and Tyson (2011) identify gaps between managerial objectives and realized e HRM outcomes, largely due to the absence of clear strategy and limited stakeholder involvement. In the context of job redesign during the AI era, this finding underscores the need for HR technology initiatives to be grounded in a coherent vision of how these systems will support task realignment. This strategic alignment is crucial not only for operational success but also for safeguarding broader organizational assets, as poorly implemented technological changes can impact stakeholder perceptions and corporate reputation in an interconnected digital landscape (Darmawan, Mendonca, & Isaac,

2022). HRM cannot simply adopt new applications for recruitment, assessment, or performance management; it must employ these systems to map work structures, identify automatable tasks, and construct redesigned workflows. Without clearly articulated strategic aims, technology adoption risks adding administrative complexity rather than enhancing job design quality, and may inadvertently introduce reputational risks by creating negative employee experiences that can easily spill over into the public domain through social media and digital networks.

In the HRM architecture literature, Lepak and Snell (2002) emphasize that organizations should differentiate their treatment of workforce segments according to the value and uniqueness of their competencies. In the AI era, this approach can be extended to guide decisions about task allocation between humans and intelligent systems. Workers possessing unique and high value competencies, such as innovation capability, nonroutine problem solving, or collaborative leadership, must be placed in job designs that allow these strengths to be fully utilized, while automation assumes responsibility for routine and repetitive tasks (Darmawan & Gardi, 2024). HRM must formulate job portfolios that explicitly assign specific responsibilities to AI systems while ensuring that human workers retain access to value creating activities. This strategic allocation is not merely an operational task but a core element of sustainable human resource development, as it leverages digital innovation to enhance both organizational efficiency and long-term human capital vitality (Mardikaningsih & Wardoyo, 2024). Through this approach, job design is not simply driven by technological possibilities but aligned with strategic decisions regarding the deployment of competencies (Onnen, 2025) in a manner that supports organizational sustainability.

Advances in HR analytics further enhance HRM's decision making capacity in job redesign. Marler and Boudreau (2017) highlight that data-based HR analytics can improve decision quality when implemented systematically and accompanied by adequate interpretive capability. In job design under AI conditions, HR analytics can be used to monitor the effects of automation on workload, productivity, and indicators of employee well-being (Medina Sotelo et al., 2025). This focus on well-being is critical, as research by Darmawan (2020) underscores that the health and psychological

welfare of employees, particularly in an AI-integrated environment, are directly linked to sustained productivity and organizational performance. Furthermore, the effective use of such analytical capabilities aligns with a broader policy imperative to strategically develop human resources that are resilient and adaptive to technological change (Rojak, 2024). Data on turnover, absenteeism, engagement, and work experience surveys provide insight into whether hybrid workforce configurations are balanced or generating excessive strain. HRM professionals proficient in analytics can leverage such data to propose evidence-based job design adjustments, creation of new roles, or targeted support programs. This ensures that job structures evolve in alignment with organizational dynamics while proactively safeguarding employee well-being, a crucial factor for maintaining a productive and resilient hybrid workforce (Darmawan, 2020; Medina Sotelo et al., 2025), thereby operationalizing a key objective of contemporary human resource development policy in the digital age.

Another challenge in job redesign concerns the translation of strategic policies into daily practice. Purcell and Hutchinson (2007) argue that line managers are pivotal agents who operationalize HRM practices and influence how policies are experienced by employees. In digital transformation contexts, line managers often supervise direct interactions between workers and AI systems within their units. Their effectiveness in this role is a critical determinant of overall organizational effectiveness, acting as a key distribution point for factors such as clear communication, change management, and role clarity within the workforce (Darmawan, 2024). HRM must therefore implement development programs that equip line managers with the ability to understand principles of sound job design, manage change processes, and communicate emerging role expectations. Without such capacity, strategically designed job structures may fail to materialize consistently, undermining effective management of the hybrid workforce and hindering the organization's ability to distribute and embed the essential factors that drive overall performance.

Global scale disruptions triggered by the COVID 19 pandemic provide a clear illustration of HRM's role in reconfiguring work. Caligiuri et al. (2020) show that international HRM practices had to adapt rapidly to remote work, mobility restrictions, and global supply chain changes. Under these conditions, HRM was tasked with redesigning work arrangements that previously relied heavily on physical presence into digitally mediated collaboration while maintaining productivity and employee well being across locations. This experience underscores that disruptive events can accelerate technology adoption and prompt extensive job redesign. HRM becomes central in coordinating flexible work policies, providing technological support, and adjusting performance indicators to align with new work patterns.

Behavioral dimensions of strategic HRM strengthen the argument for HRM's involvement at every stage of job redesign. Wright and Nishii (2013) emphasize distinctions between intended, interpreted, and actual HRM practices experienced by employees. In the context of AI and automation, these gaps may widen as workers confront uncertainty about job stability and shifting role expectations. HRM must ensure that job redesign efforts extend beyond policy documentation to include communication, training, and psychological support (Soliani et al., 2024). The goal is to minimize discrepancies between the organization's strategic intentions for technology utilization and employees' lived experiences in their redesigned roles, thereby preserving the quality of employment relationships.

Across these developments, HRM's role in job redesign during the AI and automation era can be understood as an integrative activity that reconciles technological logic, business strategy, and human work experience. HRM must interpret technological possibilities, evaluate their implications for job portfolios, and translate them into coherent task structures, roles, and reporting arrangements. On one hand, HRM must prevent automation from diminishing the meaning of work and oversimplifying roles. On the other, HRM must help organizations leverage AI effectively to reduce routine burdens and create opportunities for value generating activities.

Managerial implications arising from this discussion indicate the need for new capacities within HRM units that integrate business strategy, job design, and digital technologies. HRM professionals must strengthen data literacy, develop the ability to engage in dialogue with AI system developers, and cultivate sensitivity to workers' psychological dynamics. Organizations seeking to deploy AI and automation in a sustainable manner must position HRM as a principal partner in job redesign rather than limit its role to

administrative execution at later stages. Without such repositing, the introduction of advanced technologies risks producing work configurations that are difficult to operationalize, diminishing employee engagement, and ultimately constraining the achievement of long-term organizational objectives.

Future Competency Frameworks for the Digital Workforce

The development of competency frameworks for digital labor must begin with an understanding of the structural shifts driven by industrial transformations grounded in cyber physical systems and AI. Hecklau et al. (2016) demonstrate that workforce demands in the industry 4.0 era comprise a combination of technical, methodological, social, and personal competencies that reinforce one another within highly digitalized work environments. Technical competencies encompass knowledge of automation systems, data analytics, and interaction with intelligent interfaces, whereas methodological competencies involve problem solving skills, systemic thinking, and innovation capability. At the same time, social and personal competencies are essential for maintaining collaborative effectiveness within dispersed teams and for navigating ongoing change (Soliani et al., 2024). Consequently, future competency frameworks cannot rely on rigid distinctions between hard skills and soft skills but must instead integrate them into a unified profile that supports work within digital ecosystems. This shift necessitates an inclusive approach to competency development that acknowledges and addresses foundational disparities in technology access and digital literacy, which form the critical substrate for acquiring more advanced, hybrid skill sets in the modern workplace (Arifin & Darmawan, 2021).

The dimension of digital competence constitutes a foundational element of the future workforce profile. Van Laar et al. (2017) propose a set of twenty first century skills closely linked to the use of information technologies, including information literacy, digital communication, online collaboration, creativity, critical thinking, and problem solving. They emphasize that digital skills extend beyond the technical ability to operate tools and include reflective capacities such as evaluating information quality, managing online presence, and upholding ethical standards in digital interaction. Within hybrid workforce arrangements, workers with mature digital competencies are better equipped to collaborate with AI systems, leverage data for daily decision making, and adapt to rapid transitions across work platforms (Onnen, 2025). HRM must therefore incorporate digital competence as a central pillar within organizational competency models.

Shifts in labor demand patterns highlight the rising value of social and emotional skills amid increasing automation (Medina Sotelo et al., 2025). Deming (2017) shows that occupations requiring a combination of cognitive abilities and social skills tend to grow more rapidly and command higher wages than those dependent on routine cognitive tasks. This trend reflects the susceptibility of procedurally definable tasks to automation, whereas face to face interactions, negotiation, persuasion, and team coordination remain difficult to replicate algorithmically (Kim et al., 2024). The heightened importance of these interpersonal and relational competencies marks a significant evolution in the nature of work, one that is also reshaping the dynamics of management and collaboration within modern organizational structures, including in multinational settings (Darmawan et al., 2023). In future competency frameworks, the ability to build constructive work relationships, demonstrate empathy, and communicate persuasively constitutes a critical foundation, particularly when humans and AI systems work side by side in service delivery, decision making, or complex problem solving (Chalaemwongwan et al., 2025).

In the HRM architecture literature, Lepak and Snell (2002) emphasize that organizations should differentiate their treatment of workforce segments according to the value and uniqueness of their competencies. In the AI era, this approach can be extended to guide decisions about task allocation between humans and intelligent systems. Workers possessing unique and high value competencies, such as innovation capability, nonroutine problem solving, or collaborative leadership, must be placed in job designs that allow these strengths to be fully utilized, while automation assumes responsibility for routine and repetitive tasks. This fundamental reconfiguration of labor and task architecture, which is already being observed in sectors like manufacturing, necessitates a parallel evolution in how human capabilities are defined and developed (Triono et al., 2025). HRM must formulate job portfolios that explicitly assign

specific responsibilities to AI systems while ensuring that human workers retain access to value creating activities. This strategic allocation is not merely an operational task but a core element of sustainable human resource development, as it leverages digital innovation to enhance both organizational efficiency and long-term human capital vitality (Mardikaningsih & Wardoyo, 2024). Through this approach, job design is not simply driven by technological possibilities but aligned with strategic decisions regarding the deployment of competencies (Onnen, 2025) in a manner that supports organizational sustainability.

The literature on digital labor emphasizes that technological transformation reshapes how individuals interact with organizations and their work. Colbert et al. (2016) observe that digital workers operate within environments characterized by high connectivity, accelerated information flow, and blurred boundaries between work and personal life. In such conditions, competencies related to self management, including attention regulation, self discipline, and boundary setting, become essential for maintaining productivity and well being. Future competency frameworks for digital labor must therefore incorporate self management dimensions alongside technical and social competencies to support long term functioning in fast paced and frequently asynchronous work rhythms.

From the perspective of dynamic capabilities theory, workforce competencies can be understood as integral to an organization's capacity to sense opportunities, seize them, and reconfigure resources continuously. Teece (2007) explains that dynamic capabilities enable organizations to adapt to rapidly changing environments through processes of learning, knowledge integration, and structural transformation. Within this framework, individual competencies play a vital role in supporting dynamic capabilities, particularly when workers are encouraged to experiment with new technologies, propose process improvements, and adjust work practices. HRM units that design future competency frameworks must consider how individual competencies contribute to organizational capacity for managing technological change rather than merely satisfying current role requirements (Chalaemwongwan et al., 2025).

The concept of employability offers another lens for understanding future competencies within the digital workforce. Van der Heijde and Van der Heijden (2006) propose a competency-based model of employability comprising expertise, anticipation and optimization, personal flexibility, balance, and corporate identity. They assert that employability concerns not only the ability to secure new employment but also the capacity to sustain and advance one's career amid change. In work environments characterized by gig work, remote arrangements, and intensive interaction with AI, future competency frameworks must incorporate dimensions of sustainable career readiness (Khan et al., 2025). These dimensions include the ability to anticipate shifts in work demands, willingness to relearn, and capacity to renegotiate professional identity as roles undergo redefinition.

Discussions on competency development inevitably intersect with the role of work experience and workplace learning. Tynjälä (2008) demonstrates that workplace learning emerges through the interplay of practical experience, reflection, and social interaction, resulting in the integration of theoretical, procedural, and reflective knowledge. In digital environments, such learning opportunities arise through involvement in cross functional projects, the use of digital collaboration platforms, and interaction with intelligent systems that provide continuous performance feedback. Future competency frameworks must be designed to accommodate workplace-based learning by encouraging workers to explore new technologies and align them with their work objectives and career development trajectories (Jewel and Mouli, 2025).

Emotional and social intelligence constitutes another central dimension within modern competency research. Boyatzis (2008) emphasizes that success in many professional roles depends on individuals' ability to recognize emotions in themselves and others, manage relationships, and maintain enduring motivation. In digital work settings characterized by virtual interaction, pronounced cultural differences, and uncertainty generated by automation, these emotional competencies become crucial for team effectiveness and leadership practice (Medina Sotelo et al., 2025). Future competency frameworks for digital labor should therefore encompass emotional intelligence, as it equips individuals to manage technological change anxiety, build trust within virtual teams, and

sustain commitment to shared goals (Chalaemwongwan et al., 2025).

The transformation of professional work brought about by digitalization has significant implications for the content and orientation of competency frameworks. Susskind and Susskind (2015) illustrate how traditional professions such as law, accounting, and medicine are undergoing substantial change through the adoption of knowledge-based systems and artificial intelligence. They argue that future professional practice will shift from models grounded in individual expertise toward system-based modes of practice in which knowledge is embedded within digital platforms and disseminated broadly. This shift indicates the need for professional workers to develop competencies oriented toward interpreting system generated outputs, collaborating with digital platforms in the delivery of services, and continuously updating their knowledge as databases and algorithms evolve (Kim et al., 2024). Competency frameworks for digital labor in such professions must therefore reflect these transformations.

Work environments characterized by volatility, uncertainty, complexity, and ambiguity require adaptable competency profiles (Warin and Darmawan, 2024). Bennett and Lemoine (2014) describe the VUCA concept as a general portrayal of contemporary business environments and emphasize the importance of situational sensemaking, risk governance, and decision making under limited information. For digital workers, the ability to navigate ambiguity and make judgments amid evolving streams of information constitutes a core element of professional competence. Future oriented competency frameworks must explicitly incorporate reflective thinking, psychological resilience, and cognitive flexibility to ensure that workers are prepared to confront disruptions and unpredictable changes, including those driven by advances in AI and automation.

From these ideas emerges a broader portrayal of the hybrid and dynamic nature of future competencies for digital labor. Such competency profiles encompass digital technology mastery, analytical capability, socioemotional skills, self management capacity, and readiness for lifelong learning. In practice, organizations must translate these broad concepts into operational competency descriptions for each role while maintaining

mechanisms for periodic review so that competency models remain relevant in the face of technological shifts. For workers, these frameworks serve as a guide for structuring personal development efforts and assessing their readiness for evolving job demands shaped by AI and automation.

The implications for HRM include the need to reposition competency management from the creation of static lists of required skills to the stewardship of a forward-looking learning ecosystem. Future oriented competency frameworks should function as dynamic instruments that inform core HR processes ranging from recruitment to career development while allowing space for worker driven learning initiatives. Through this approach, organizations can cultivate a digital workforce capable of operating advanced technologies, engaging in critical thinking, collaborating across boundaries, and sustaining career trajectories amid rapid changes in work.

D. CONCLUSIONS

The development of digital technology, particularly artificial intelligence and automation, has fundamentally changed the landscape of work, driving transformation in job design, working relationships, and the competency profiles required. This research highlights that the integration of technology into the world of work must be approached strategically and humanely, balancing technical efficiency with considerations for quality of working life, career sustainability, and organisational fairness.

The research findings identify the central role of Human Resource Management (HRM), which must evolve from an administrative function to a strategic partner. HR involvement from the automation design phase is crucial to ensure that the allocation of tasks between humans and intelligent systems not only increases productivity but also maintains autonomy, meaning of work, and opportunities for self-development for employees. Without strategic guidance from HR, the application of technology risks creating fragmented job designs, marginalising certain groups of workers, and causing anxiety and a decline in organisational commitment.

On the other hand, the workforce in the digital era requires a new competency framework that is hybrid, dynamic, and integrated. Future competencies no longer rigidly separate technical

skills (hard skills) and soft skills, but rather combine the two into a single, comprehensive profile. This profile includes: (1) Digital Proficiency, which encompasses information literacy and the ability to collaborate on digital platforms; (2) Analytical and Problem-Solving Skills to interpret data and make system-based decisions; (3) Socio-Emotional Intelligence, such as empathy, persuasive communication, and the ability to build trust in virtual teams; (4) Self-Management Skills, including attention regulation, discipline, and maintaining boundaries between work and personal life; and (5) Lifelong Learning Mindset and adaptability in facing VUCA (Volatility, Uncertainty, Complexity, Ambiguity) environments.

The practical implications of these findings emphasise the need for organisations to build an adaptive learning ecosystem. HR must manage competencies not as a static list, but as a dynamic system that informs all core HR processes from recruitment and training to career development. In addition, strengthening HR analytical capabilities, developing line managers as agents of change, and transparent transformational communication are key to successfully managing this transition.

Finally, the sustainability of work transformation in the digital age requires solid tripartite collaboration between HR functions, business leaders, and technology developers. Only through this strategic partnership can organisations bridge competency gaps, reduce resistance, and create hybrid work configurations that are not only technologically savvy, but also inclusive, human-centred, and ready for the ever-changing future of work. In this way, organisations can achieve sustainable competitive advantage while empowering every individual in an increasingly digital work environment.

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