Linking Digital Transformation and Sustainable HRM: A Conceptual Framework on the Mediating Role of Digital Competencies

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ABSTRACT

The accelerating pace of digital transformation is fundamentally revolutionizing organizational structures and practices, yet its connection to sustainable Human Resource Management (SHRM) remains unclear. Although many organizations invest heavily in digital technologies, they often struggle to align these innovations with sustainability goals because of uneven digital competencies among employees and leaders. To address this gap, this study proposes a conceptual framework that positions digital competencies such as technological proficiency, digital literacy, cybersecurity, and AI skills as the critical mediators between digital transformation and SHRM. Using a narrative review methodology, the authors reviewed Scopus-indexed literature published between 2019 and 2025 across the fields of HRM, sustainability, and digital innovation, drawing on the Resource-Based View and Dynamic Capabilities Theory. The findings suggest that digital transformation alone cannot drive sustainable HR outcomes; rather, its effectiveness depends on the strategic development of digital competencies at both individual and organizational levels. Specifically, these competencies enable practices such as green recruitment, eco-efficient performance management, and inclusive digital cultures. In the absence of such capabilities, organizations risk underutilizing the sustainability potential of their digital investments. Theoretically, this framework advances SHRM research by integrating digitalization into the sustainability agenda. Practically, it provides HR leaders with an actionable roadmap to prioritize digital upskilling as a means to unlock sustainable value from technology. The study concludes by calling for empirical validation of the proposed model and further investigation into contextual factors, including industry type, organizational size, and national culture, that may shape its implementation. Ultimately, this study lays the groundwork for HR systems that are not only digitally advanced but also environmentally responsible and socially equitable in the era of Industry 5.0, which is a concept denoting human-centric and sustainable technological integration.

Keywords: Digital transformation, Digital competencies, Sustainable human resource management (SHRM), Conceptual framework, Sustainability

INTRODUCTION

In today's volatile, technology-driven business environment, organizations face mounting pressure to reconcile digital innovation with sustainability imperatives. Digital transformation was defined as the strategic integration of digital technologies across all organizational functions, and is no longer optional but a core driver of competitiveness and resilience (Hornungová & Petrová, 2025; Sharma & Kohli, 2023). Simultaneously, sustainable Human Resource Management (HRM) has emerged as a critical lever for embedding environmental, social, and governance (ESG) principles into talent practices (Andestari et al., 2024). Yet, the mechanism through which digital transformation translates into sustainable HRM outcomes remains conceptually underdeveloped. This paper addresses this nexus by proposing a novel conceptual framework that positions digital competencies,

such as technological proficiency, digital literacy, cybersecurity, and AI skills (Cardoso & Gomes, 2025), as key enablers required to effectively leverage digital tools in connecting digital transformation to sustainable HRM.

It is increasingly recognized in the literature that digital transformation reshapes HRM beyond automation, influencing recruitment, learning, performance management, and employee engagement (Zhang & Chen, 2024). When aligned with sustainability goals, such digital HRM practices can foster green behaviors, inclusive cultures, and long-term value creation (Singh et al., 2025; Lou et al., 2024). However, this alignment is not automatic, and it depends on the organization's capacity to cultivate digital competencies at individual and systemic levels. Without such competencies, digital investments could lead to inefficiencies, ethical dilemmas, or even digital stress that undermines well-being and sustainability (Gupta et al., 2025). Thus, while prior studies acknowledge the potential synergy between digitalization and sustainability in HRM, they often treat these domains in isolation or assume a direct causal link without specifying the mediating processes.

This oversight constitutes a significant theoretical and practical problem. Despite growing scholarly interest in both digital HRM and sustainable HRM, there is still a lack of integrative models that explain how digital transformation empowers sustainability-oriented HR practices (Poulose et al., 2024). Organizations struggle to design HR strategies that simultaneously harness digital potential and advance ESG objectives, leading to fragmented initiatives and suboptimal outcomes (Mijatović et al., 2020). The absence of a coherent framework hinders both scholarly progress and managerial action, particularly in contexts where digital maturity and sustainability literacy are still evolving.

To address this gap, this paper proposes a conceptual framework that highlights the mediating role of digital competencies in the relationship between digital transformation and sustainable HRM. In line with the recent calls for process-oriented theorizing in HRM (Poulose et al., 2024; Singh et al., 2025), the proposed conceptual framework goes beyond correlation to articulate a causal pathway whereby digital transformation fosters organizational and employee-level digital competencies, which in turn enable the design and implementation of HRM practices that promote environmental stewardship, social equity, and economic resilience. By synthesizing empirical insights from Scopus-indexed studies on digital HRM, green talent management, and sustainable innovation, this paper offers a structured, theoretically informed model to guide future research and practice.

The significance of this work lies in its dual contribution. Theoretically, it advances the field by integrating the Resource-Based View (Barney, 2001) as applied in digital contexts by Alexandro (2025), and Dynamic Capabilities Theory (Teece, 2007 & Sun et al., 2024) to explain how digital competencies function as strategic reconfigurable resources. Practically, it equips HR leaders with a roadmap to align digital investments with sustainability goals, thereby enhancing organizational legitimacy and long-term performance (Adisa et al., 2024). The remainder of this paper is structured as follows: Section 2 reviews the literature on digital transformation and sustainable HRM; Section 3 presents the proposed conceptual framework; Section 4 outlines methodological considerations for future validation; Section 5 discusses theoretical and managerial implications; and Section 6 concludes with limitations and avenues for future research.

LITERATURE REVIEW

Digital transformation is increasingly recognized not merely as a technological shift but as a strategic enabler of sustainability in human resource management. Recent scholarship underscores that for digital transformation to meaningfully contribute to sustainable HRM, it must be deliberately aligned with ESG objectives from the outset (Hornungová & Petrová, 2025). Central to the alignment between digital transformation and sustainable HRM are digital competencies, which encompass the cognitive, technical, and behavioral capabilities that enable HR professionals and employees to leverage digital tools for sustainable organizational outcomes.

Digital transformation for sustainable HRM

Digital transformation serves as a catalyst for sustainable human resource management (HRM) by embedding advanced technologies such as artificial intelligence (AI), big data analytics, and cloud computing into HR processes. Through HR digitalization, organizations are able to optimize recruitment, performance management, and employee development while aligning these processes with sustainability objectives (Andestari et al., 2024;

Vărzaru, 2022). This transformation extends beyond automation to encompass the redesign of HR strategies that promote efficiency, transparency, and social responsibility. For instance, the integration of digital tools in HR functions enhances workforce analytics and evidence-based decision-making, enabling organizations to address sustainability challenges such as resource optimization and equitable employment practices (Fenech et al., 2019; Cumba et al., 2024). Therefore, digital transformation acts as both an operational and strategic enabler, positioning HRM as a driver of organizational sustainability.

The successful implementation of HR digitalization, however, depends on the development of relevant digital competencies among HR professionals. These competencies include technological proficiency, data analytics literacy, and digital ethics, which together empower HR practitioners to leverage digital systems effectively and responsibly (Cardoso & Gomes, 2025; Al-Tayyar, 2025). Digital competencies also facilitate the integration of green HRM practices by allowing professionals to monitor environmental performance, manage sustainable training initiatives, and cultivate an organizational culture supportive of digital innovation and sustainability (Ali et al., 2025; Singh et al., 2025). Consequently, HR professionals who possess strong digital capabilities are better equipped to align human capital strategies with environmental, social, and governance (ESG) objectives, thereby contributing to long-term organizational resilience and competitiveness (Zhang et al., 2024; Sultanova et al., 2024). In this way, digital competencies serve as the bridge between technological transformation and sustainable HR outcomes.

Ultimately, the convergence of digital transformation and digital competencies produces measurable sustainability outcomes at both organizational and societal levels. When HR digitalization is underpinned by competent digital leaders and a sustainability-oriented workforce, organizations can achieve greater operational efficiency, reduced environmental impact, and enhanced employee well-being (Honglei et al., 2025; Singh et al., 2025). Advanced digital systems, such as Human Resource Information Systems (HRIS) and AI-powered analytics, allow firms to implement performance management systems that are more flexible, inclusive, and environmentally conscious (Zournatzidou et al., 2024; Sharma & Kohli, 2023). Moreover, digital transformation supports the creation of learning organizations that prioritize continuous upskilling, innovation, and sustainable value creation (Sharma & Kohli, 2023; de Pablos et al., 2025). Therefore, when digitalization and competency development are strategically integrated within HRM, they collectively advance sustainability goals—enhancing organizational agility, promoting ethical management, and reinforcing the long-term sustainability of both business and society.

Table 1: Summary of digital transformation for sustainable HRM

Author(s) & Year	**Article Title**	**Key Findings**
Andestari et al. (2024)	*Sustainable HR Management in the Digital Era: A Conceptual Framework*	Highlights how digitalization enhances HR efficiency, transparency, and ethical practices.
Fenech et al. (2019)	*The Changing Role of HRM in an Era of Digital Transformation*	HR shifts from administrative to strategic functions through technology adoption.
Ali et al. (2025)	*AI-Driven Capabilities and Organizational Sustainability*	AI use in HR processes improves environmental and operational performance via digital literacy.
Cardoso & Gomes (2025)	*Advancing Digital Competencies in Public Administration*	Digital literacy and upskilling improve efficiency and service delivery.
Singh et al. (2025)	*Creating Sustainable Workplaces in the Digital Circular Economy*	Emphasizes integrating digital innovation into HR for sustainable work environments.
Zournatzidou et al. (2024)	*Digital Transformation and Sustainable HRM: Eco-Friendly Business Continuity*	Digital HR systems enhance performance management and reduce environmental footprint.
Zhang et al. (2024)	*Developing a Competency Model for HR Directors in Digital Transformation*	HR directors need digital agility, data analytics, and sustainability-oriented leadership.

Sultanova et al. (2024)	*Quality Management through Sustainable HRM Based on Digital Competencies*	Strong correlation between digital skills and HRM quality improvements.
de Pablos et al. (2025)	*Insights into Digital Business, HRM, and Competitiveness*	Digital innovation in HR drives competitiveness and long-term sustainability.

Across the reviewed studies, digital transformation consistently emerges as a strategic enabler of sustainable HRM, promoting efficiency, ethical management, and long-term environmental responsibility. Scholars emphasize that digital competencies, including AI proficiency, data analytics, and digital literacy, are fundamental for HR professionals to lead sustainability transitions effectively. Furthermore, the literature highlights a growing shift from purely technology-driven transformation toward a human-centric sustainability approach, stressing continuous learning, adaptability, and ethical leadership as essential pillars of sustainable HRM.

Digital competencies for sustainable HRM

Technological proficiency is a crucial digital competency that enables HR professionals to navigate the complexities of digital transformation in sustainable HRM. It is increasingly observable that proficiency in artificial intelligence (AI)-based tools and automation systems optimizes recruitment, training, and performance management while enhancing efficiency and transparency in HR processes (Singh et al., 2025; Al-Tayyar, 2025). Expertise in big data analytics and cloud computing provides HR professionals with advanced decision-making capabilities, helping organizations monitor sustainability outcomes and implement workforce strategies (Cardoso & Gomes, 2025). These competencies form the technical foundation in embedding sustainability within HR functions, which allows organizations to respond strategically to digital disruptions while achieving eco-friendly business objectives.

Beyond technical expertise, digital literacy is indispensable for HR professionals to fully leverage technological innovations for sustainable HRM. Foundational digital literacy skills allow HR practitioners to effectively navigate digital tools, while advanced literacy skills, such as cybersecurity and AI application knowledge, ensure organizational data protection and strategic integration of technology (Muzam, 2023; Ali et al., 2025). Equally vital is adaptability in change management, which enables HR leaders to guide organizations through technological shifts while aligning HR practices with broader sustainability goals (Lukita et al., 2024; Zhang et al., 2024). These competencies ensure that HR professionals can manage complex challenges, encourage employee engagement, and balance technological advancement with human-centric sustainability practices.

In rapidly changing organizations, HR directors are further expected to embody roles as strategic partners and change agents who embed sustainability into digital HR architecture (Zhang et al., 2024). Thus, digital competencies function as the critical mediating mechanism through which raw technological potential is converted into purposeful, sustainability-oriented HR practices. Digital HR systems, which are powered by AI, cloud platforms, and people analytics, streamline recruitment, performance management, and learning in ways that promote inclusion, reduce carbon footprints through approaches such as virtual onboarding, and foster employee well-being (Sposato et al., 2025; Arora et al., 2024).

For instance, Espina-Romero et al. (2024) found that SMEs with high digital competency maturity reported stronger organizational cultures centered on sustainability, as digital tools enabled transparent communication, real-time feedback, and data-driven ESG reporting. Similarly, Andestari et al. (2024) argue that digital transformation reshapes HR strategy by enabling dynamic talent development aligned with circular economy principles. However, this positive impact depends on the organization's capacity to cultivate the requisite human capabilities, and in their absence, technology remains underutilized or misaligned with sustainability goals.

Despite these opportunities, the integration of digital competencies into sustainable HRM faces significant barriers. These include managerial skill gaps, limited access to digital resources, and insufficient institutional support for upskilling (Mykhailovska et al., 2025). Moreover, ethical risks such as algorithmic bias in hiring algorithms, data privacy violations, and digital-induced stress pose serious challenges to the "sustainable" promise of digital HRM (Sani & Mandina, 2024; Arora et al., 2024). Addressing these issues requires more than

technical fixes, and it demands a human-centric approach in which digital competencies encompass ethical reasoning, fairness, and environmental consciousness (Boopathi & Gopi, 2024).

Although sustainable HRM has gained traction as a strategic approach that balances organizational performance with employee well-being and social responsibility, the mechanisms through which digital transformation supports its realization remain underexplored. Previous studies have examined digital transformation primarily from a technological or strategic management perspective, but limited research has integrated digital competencies as a mediating factor in achieving sustainable HRM outcomes. This creates a theoretical and practical gap in understanding how organizations can leverage digital transformation effectively to empower sustainable HRM practices. Consequently, there is a pressing need to develop a conceptual framework that explains the dynamic relationship between digital transformation, digital competencies, and sustainable HRM. Such a framework can provide theoretical insights into the integration of digital and human factors while offering practical guidance for HR practitioners and policymakers to establish and foster resilient organizations for a promising future.

Table 2: Summary of digital competencies for sustainable HRM

Competency Domain	**Key Elements**	**Expected Outcomes for Sustainable HRM**	**References**
Technological Proficiency	Mastery of AI, automation tools, big data analytics, and cloud computing.	Enhanced decision-making, operational efficiency, ethical AI use, and eco-efficient HR processes.	Cardoso & Gomes (2025); Singh et al. (2025); Ali et al. (2025)
Digital Literacy	Development of basic and advanced digital skills, including cybersecurity and digital communication.	Improved HR data protection, informed decision-making, and ethical technology adoption.	Muzam (2023); Ali et al. (2025)
Sustainability-Oriented Digital Skills	Integration of green HRM practices, sustainability innovation, and environmental management training.	Promotion of sustainable practices, green culture, and contribution to UN SDGs.	Kushnareva et al. (2023); Sultanova et al. (2024); Singh et al. (2025)
Change Management and Adaptability	Flexibility in managing digital transformation, redesigning HR workflows, and supporting workforce transitions.	Increased organizational resilience, agile HRM systems, and improved adaptability to digital disruption.	Lukita et al. (2024); Zhang et al. (2024);
Interpersonal and Emotional Intelligence Skills	Effective communication, collaboration, empathy, and critical thinking in digital contexts.	Strengthened employee engagement, ethical HR leadership, and human-centric digital transformation.	Muzam (2023); Zournatzidou et al. (2024)

Research Gap

Although digital transformation has become a key focus in sustainable HRM research, existing studies often overemphasize technology while neglecting the human-centric aspects of sustainability. Many scholars highlight the benefits of digital tools such as AI, automation, and big data analytics for improving efficiency and performance. However, fewer studies address how these technologies can also support employee well-being, ethical practices, and long-term social sustainability. This imbalance creates a theoretical gap where digital transformation is viewed mainly as a technological process, rather than as a human-driven change that integrates social, environmental, and moral considerations into HRM practices.

Furthermore, current frameworks on digital competencies tend to focus on technical and analytical skills, while paying limited attention to sustainability-related capabilities such as ethical decision-making, inclusivity, and adaptability. Research in this area also remains fragmented, often drawing from separate theories in HRM, sustainability, and digital transformation without integrating them into a unified framework. As a result, there is a lack of understanding of how digital competencies can function as strategic enablers of both technological advancement and sustainable human resource practices.

METHODOLOGY

Research Design: Narrative Review Methodology

This study adopts a narrative review methodology to develop a theoretically grounded conceptual framework that explains the mediating role of digital competencies in the relationship between digital transformation and sustainable Human Resource Management (SHRM). Unlike systematic reviews that prioritize statistical aggregation, narrative reviews are particularly well-suited for synthesizing complex, emerging, and interdisciplinary phenomena where theoretical integration is needed more than empirical meta-analysis (Greenhalgh et al., 2022). Given that the intersection of digital transformation, digital competencies, and SHRM is still in its conceptual infancy and that insights remain fragmented across HRM, information systems, and sustainability literature, a narrative approach allows for critical interpretation, thematic synthesis, and the construction of a coherent explanatory model (Snyder, 2019). This design enables the authors to identify underlying mechanisms, reconcile contradictory findings, and propose a novel theoretical pathway that can guide future empirical inquiry.

The narrative review method is selected instead of the systematic review method because it provides greater flexibility and is more suitable for addressing complex, interdisciplinary topics that involve conceptual linkages rather than strictly empirical relationships. While systematic reviews are recognized for their rigor, objectivity, and replicability, they are primarily designed to address narrowly defined research questions through pre-specified inclusion criteria and often focus on quantitative evidence synthesis (Lefaivre & Slobogean, 2013; Garritty et al., 2019). In contrast, the present study seeks to develop a conceptual framework by synthesizing diverse sources, including conceptual papers and theoretical discussions. Consequently, the narrative synthesis approach aligns more closely with the exploratory nature of this research.

Although systematic reviews provide precise and replicable results, they are often constrained by their narrow scope, which makes them less suitable for topics that require a broad exploration and theoretical integration (Cook, 2019; Melendez-Torres et al., 2017). In addition, systematic reviews demand extensive quality appraisal and frequently exclude studies that do not meet strict methodological standards, thereby overlooking critical theoretical or contextual insights (Melendez-Torres et al., 2018). Given that the field of digital transformation in HRM is still evolving and its conceptual boundaries are continuously expanding, such restrictions may hinder a comprehensive understanding of the topic. Therefore, a narrative approach allows for greater conceptual flexibility and inclusivity. In contrast to systematic reviews, narrative synthesis allows for the inclusion of diverse forms of evidence, including qualitative insights, theoretical reflections, and conceptual arguments (Pittman, 2023; Skelly et al., 2019). This flexibility supports the integration of complex constructs such as digital competencies, sustainability, and HRM practices, each of which involves contextual variability and multidimensional interactions.

Key Steps in Conducting the Narrative Review

The narrative review process involves three key steps, namely: planning, data collection, and thematic synthesis. During the planning stage, the research scope was defined to focus on studies connecting digital transformation with sustainable HRM outcomes. For data collection, the Scopus database was selected due to its extensive coverage of high-impact peer-reviewed journals across business, management, and social sciences. The review strategy emphasizes inclusivity, by incorporating articles that encompass conceptual, empirical, and theoretical research. Finally, the collected literature was reviewed using an integrative thematic approach, which facilitated the identification of recurring patterns, key concepts, and theoretical underpinnings that informed the development of the proposed conceptual framework (Snyder, 2019).

The selection process for this literature review followed a transparent and systematic approach to ensure the inclusion of high-quality and relevant studies. A total of 48 journal articles were carefully selected through an extensive search conducted exclusively using the Scopus AI database, which is recognized for its comprehensive and peer-reviewed academic coverage. To maintain the relevance and currency of the findings, the time frame was limited to studies published between 2019 and 2025, reflecting the period when digital transformation, digital competencies and sustainable HRM gained significant scholarly and practical attention, particularly in response to global technological and environmental changes. Following the identification of potential sources, a rigorous screening process was applied to include only studies that directly addressed the intersection of digital transformation, digital competencies and sustainability within HRM, while excluding irrelevant or non-empirical papers.

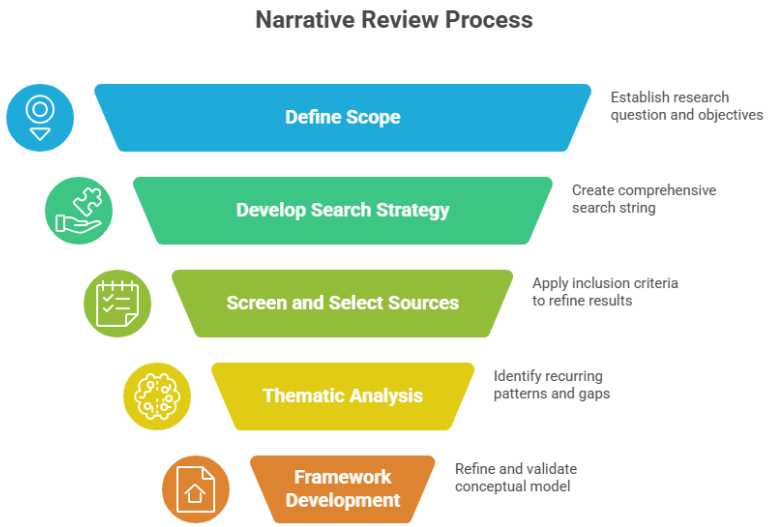

Figure 1: Narrative Review Process

Data Collection and Review Strategy

Data collection was conducted through the Scopus database using a carefully constructed search string: “digital transformation” or “digital change” or “digital shift” or “technology adoption”; AND “sustainable” or “eco-friendly” or “green” or “environmental”; AND “human resource” or “HR” or “workforce” or “personnel”; AND “management” or “administration” or “oversight” or “governance”; AND “employee engagement” or “talent management” or performance” or “development”; AND “organizational change” or “business strategy” or “innovation” or “process improvement”. This search string ensures comprehensive coverage of relevant literature while filtering out unrelated studies. Articles were screened based on relevance, publication quality, and conceptual alignment with the study’s objectives. The final selection included peer-reviewed journal articles published between 2013 and 2024, ensuring both foundational and contemporary perspectives. To synthesize findings, an integrative thematic analysis approach was employed, which enabled the clustering of themes around digital transformation, digital competencies, and sustainable HRM (Thomas & Harden, 2008).

Key Findings from the Narrative Review

The narrative review reveals that digital transformation alone is insufficient to drive sustainable HRM; its impact is fully realized only when mediated by well-developed digital competencies across the organization. These competencies, which are technological proficiency, digital literacy, cybersecurity, and AI skills act as the operational bridge that transforms digital infrastructure into sustainability-oriented HR practices such as green talent acquisition, eco-efficient performance systems, and inclusive digital cultures. However, this pathway is fraught with challenges, including skill gaps, resource inequities, and ethical dilemmas related to AI bias and data privacy. Critically, the literature confirms that organizations that strategically invest in building digital competencies while embedding sustainability into their digital HR architecture achieve superior outcomes in innovation, employee well-being, and environmental regulations. These synthesized insights directly inform the proposed conceptual framework by positioning digital competencies as the central mediating variable that

explains how digital transformation empowers sustainable HRM, thereby addressing a significant theoretical gap in the current literature.

Table 3. Key Findings from the Narrative Review

Theme	Key Findings	Description	REFERENCES
Role of Digital Transformation in Sustainable HRM	Strategic Instrument for Sustainability	Digital transformation enhances operational efficiency, fosters innovation, and supports sustainability goals when aligned with sustainability strategies.	Hornungová & Petrová (2025); Sharma & Kohli (2023)
	Impact on HR Practices	HR processes (recruitment, training, development, maintenance, separation) are significantly reshaped by digital technologies, requiring sustainability integration.	Andestari, Sabellah, & Muafi (2024); Singh et al. (2025)
	Enhancing Competitiveness & Innovation	Digital tools and HR information systems foster competitiveness, streamline HR operations, and improve decision-making.	Fenech, Baguant, & Ivanov (2019); Alqarni et al. (2023)
Digital Competencies and HRM	Development of Digital Skills	Digital skills (AI literacy, data analytics, technological adaptability, and change management) are critical for HR sustainability.	Singh et al. (2025); Mykhailovska et al. (2025)
	Role of HR in Digital Transformation	HR managers are pivotal in shaping digital skill sets, fostering a learning culture, and enabling sustainability-driven innovation.	Sharma & Kohli (2023); Singh et al. (2025)
Framework for Sustainable HRM	Integration of Digital & Sustainable Practices	Aligning digital HRM practices with sustainability strategies enhances performance, innovation, and organizational resilience.	Andestari et al. (2024); Singh et al. (2025); Ma, Zhang, & Dong (2023)
	Challenges & Opportunities	Key barriers include resistance to change, skills gaps, budget constraints, and lack of institutional support. Overcoming these requires digital literacy initiatives and supportive leadership.	Mykhailovska et al. (2025); Enaifoghe et al. (2024)
Ethical Considerations	Human-Centric and Ethical Concerns	Digital HR raises issues such as privacy, data security, AI bias, employee well-being, and environmental impact, requiring transparent and accountable HR practices.	Arora et al. (2024); Sani & Mandina (2024)

The narrative review highlights that digital transformation functions as both a strategic enabler and a disruptor of HRM practices, with significant implications for sustainability. As a strategic instrument, digital

transformation drives efficiency, innovation, and sustainability integration, provided that digital initiatives are aligned with broader organizational sustainability goals (Hornungová & Petrová, 2025; Sharma & Kohli, 2023). Beyond improving HR functions such as recruitment, training, and employee engagement, digital technologies encourage competitiveness and organizational agility through tools like HR information systems and AI-based decision-making platforms (Fenech et al., 2019).

Central to this transformation is the development of digital competencies, which are vital for HR professionals and employees to thrive in the digital era. Competencies such as data literacy, AI proficiency, continuous learning, and adaptability not only enable digital adoption but also foster a culture of innovation and sustainability (Singh et al., 2025; Mykhailovska et al., 2025). HR professionals play a significant role in implementing these skills, hence positioning themselves as the key players of digital change and sustainability-oriented organizational cultures (Sharma & Kohli, 2023).

The review further demonstrates that sustainable HRM is best achieved when digital practices are fully integrated with sustainability objectives, thereby aligning workforce strategies with the ESG principles (Andestari et al., 2024; Ma et al., 2023). However, this integration is not without challenges. Organizations often face barriers such as limited resources, digital resistance, and competency gaps, which necessitate strong leadership, ongoing training, and supportive infrastructures to overcome (Mykhailovska et al., 2025; Enaifoghe et al., 2024). Finally, the adoption of digital competencies in HRM raises important ethical considerations. Issues such as employee privacy, AI bias, data governance, job security, and well-being demand careful oversight and transparent policies to ensure that digital transformation supports not only organizational goals but also human dignity and fairness (Arora et al., 2024; Sani & Mandina, 2024).

Overall, the findings reinforce that digital transformation empowers sustainable HRM when it is mediated by robust digital competencies, thereby empowering sustainable HRM by enhancing innovation, resilience, and competitiveness while ensuring ethical and socially responsible practices. This synthesis provides the foundation for developing the proposed conceptual framework that integrates digital transformation, digital competencies, and sustainable HRM.

DEVELOPMENT OF CONCEPTUAL FRAMEWORK

The theoretical framework of this study is grounded in the Resource-Based View (RBV) and the Dynamic Capabilities Theory**,** both of which provide comprehensive explanations of how organizations leverage internal capabilities to achieve sustainable competitive advantage. The RBV emphasizes that organizational resources, when valuable, rare, inimitable, and non-substitutable (VRIN), can yield long-term advantages, particularly when directed toward strategic goals such as sustainability (Barney, 1991; Hart, 1995).

Resource-Based View (RBV) Theory

The Resource-Based View (RBV) provides a valuable theoretical foundation for understanding the strategic importance of digital competencies in achieving sustainable competitive advantage. Rooted in the idea that unique, inimitable, and non-substitutable resources drive organizational success, the RBV highlights how digital capabilities serve as critical strategic assets in the digital economy. Specifically, digital competencies encompassing IT knowledge, IT operations, and IT objects are instrumental in enabling firms to leverage technology for enhanced market and developmental performance (Gibb & Haar, 2007). In public sector contexts, such as Indonesia's Ministry of Agrarian and Spatial Planning, the integration of digital competencies has been shown to catalyze organizational transformation and improve operational efficiency (Mulianto et al., 2024). These findings underscore that digital capabilities, when effectively cultivated, not only support process innovation but also strengthen an organization's ability to respond adaptively to changing environments.

Moreover, RBV emphasizes that digital transformation initiatives must align digital capabilities with broader strategic objectives to yield performance benefits. For example, in small and medium-sized enterprises (SMEs), the development of digital competencies plays a decisive role in building resilience and competitiveness, particularly through the integration of digital technologies such as big data analytics, cloud computing, and the Internet of Things (Inan, 2024; Edu et al., 2020). However, while digital transformation offers substantial

opportunities for value creation, a significant number of initiatives fail due to the absence of coherent capability development strategies. This gap highlights the necessity for firms to establish comprehensive and adaptive digital transformation systems that ensure technology adoption is strategically aligned with business goals (Mulianto et al., 2024). Within this framework, human capital emerges as a key mediating factor, as the acquisition and application of digital skills among employees enhance the firm's ability to exploit technological innovations for improved organizational performance (Kampoowale et al., 2025; Alharthi & Soomro, 2025).

Ultimately, the RBV theory positions digital competencies as vital resources that contribute to long-term sustainability and competitive differentiation. Organizations that invest in digital skills and capabilities can effectively bridge technological potential with human-centered innovation, enabling the creation of value through improved decision-making, productivity, and strategic agility. Consequently, digital competencies not only reinforce the firm's internal resource base but also drive the successful implementation of digital transformation and sustainable HRM practices. By emphasizing the strategic integration of technological proficiency, data literacy, and adaptive learning, RBV highlights that the true source of advantage in the digital age lies not merely in technology itself, but in the distinctive capabilities of people and processes that harness it effectively.

Dynamic Capabilities Theory

Meanwhile, Dynamic Capabilities Theory (DCT) highlights an organization's ability to adapt, integrate, and reconfigure resources in response to changing environments, making it especially relevant to digital transformation and sustainable human resource management (Teece et al., 1997). Together, these theories provide the foundation for understanding how digital competencies serve as critical resources that empower sustainable HRM in the era of digital transformation.

Dynamic Capabilities Theory (DCT) offers a powerful lens for understanding how organizations continuously adapt their internal resources to thrive in volatile digital and sustainability-driven landscapes. At its core, DCT posits that competitive advantage stems not from static resources but from an organization's ability to sense emerging opportunities, seize them through reconfiguration, and transform its capabilities in response to environmental shifts (Teece, 2007, Öztürk, 2024; de la Torre & De la Vega, 2025). In the context of Human Resource Management (HRM), this translates into the deliberate cultivation and evolution of digital competencies, such as data literacy, AI fluency, and digital change agility, which function as dynamic, reconfigurable assets that enable HR functions to innovate sustainably. Rather than treating digital tools as isolated inputs, DCT frames digital transformation as an ongoing process of capability building, wherein HR systems are continuously reshaped to align with strategic sustainability goals and technological disruptions (Demeter et al., 2021; Starke & Ludviga, 2025).

The operationalization of DCT in digital HRM unfolds through four interrelated capabilities. First, sensing capability allows organizations to scan the external environment for digital trends and sustainability imperatives, thereby informing proactive HR strategies (Demeter et al., 2021). Second, absorptive capacity enables firms to assimilate new digital knowledge and integrate it into HR practices. For example, by using people analytics for green talent forecasting and thus convert digital transformation into intellectual capital (Ardda et al., 2025; Chaubey, 2025). Third, integrative capability ensures that digital infrastructure, HR processes, and employee skills are cohesively aligned; for instance, digital transformation teams must coordinate data literacy with business process redesign to drive HR innovation (Li, 2023). Finally, relational capability leverages internal and external networks, including cross-functional collaboration and industry partnerships, to co-create sustainable HR solutions and amplify innovation impact (Demeter et al., 2021). Together, these capabilities form a dynamic ecosystem in which digital competencies are not fixed traits but evolving organizational routines.

This adaptive process directly fuels HR innovation through strategic digital HRM (Alexandro, 2025) and Human Resource Digital Transformation (HRDT), which is a multidimensional construct that blends digital infrastructure with individual creativity to enhance organizational resilience in turbulent times (Bansal et al., 2023). Empirical evidence shows that when Sustainable HRM leverages dynamic capabilities, it triggers a chain mediation of organizational learning and resilience, which synergistically boosts innovation in areas such as eco-efficient performance management and inclusive digital recruitment (Wang et al., 2025). Critically, this process

is amplified by leadership that champions digital competency development and embeds it within broader sustainability strategies (Khanh & Cuong, 2025). Thus, DCT not only explains how digital competencies evolve but also clarifies why they are indispensable for sustaining HR innovation in the digital-sustainability nexus, positioning HR not as a passive adopter of technology but as an active architect of adaptive, future-ready, and responsible people practices.

In this study, these theoretical perspectives clarify the role of digital competencies as mediating mechanisms linking digital transformation to sustainable HRM. RBV highlights the strategic value of digital skills, technological know-how, and innovative HR practices as resources that strengthen organizational sustainability outcomes (Sharma & Kohli, 2023; Singh et al., 2025). Dynamic capabilities, on the other hand, emphasize how HR professionals and organizations must continuously sense, seize, and transform digital opportunities to embed sustainability into HRM practices (Ma et al., 2023). This conceptualization allows the framework to move beyond static resource possession toward adaptive resource orchestration, where digital competencies act as enablers of innovation, employee resilience, and ethical HR practices (Fenech et al., 2019; Mykhailovska et al., 2025).

From a theoretical standpoint, the integration of RBV and Dynamic Capabilities Theory provides a nuanced understanding of how digital transformation fosters sustainable HRM, while also contributing to the literature on HR digitalization and sustainability. Conceptually, this framework positions digital competencies as a mediating construct, connecting the technological and human aspects of organizational sustainability. Practically, it offers guidance for HR practitioners and policymakers to design interventions that not only build digital literacy but also embed sustainability in HR strategies, thereby enhancing organizational resilience, innovation, and ethical responsibility (Enaifoghe et al., 2024; Arora et al., 2024). In conclusion, this conceptual framework provides a comprehensive lens to examine the interconnectedness of digital transformation, digital competencies, and sustainable HRM, offering both scholarly insights and actionable implications for future research and practice.

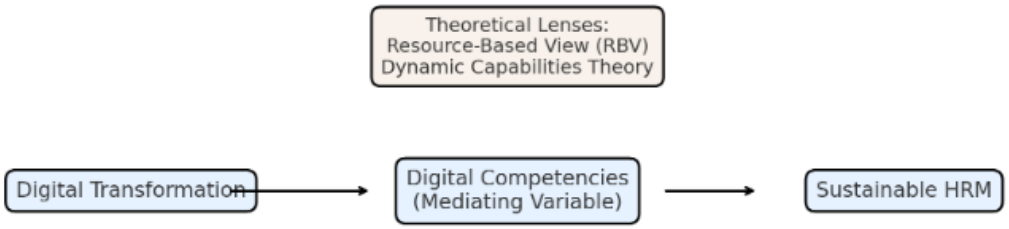

Figure 2: Proposed Conceptual Framework

Proposition Development

Digital transformation affects digital competencies

Digital transformation significantly shapes the development of digital competencies by driving organizations to adapt their workforce capabilities to meet emerging technological demands. As digital technologies redefine HRM processes, such as recruitment, performance management, and learning, employees are required to acquire new skills in data analysis, artificial intelligence, and digital collaboration to remain effective contributors (Lukita et al., 2024; van den Berg et al., 2020). Studies emphasize that digital transformation not only necessitates technical proficiency but also promotes adaptive competencies, such as resilience, change management, and continuous learning, which enhance organizational agility (Zhang et al., 2024; Espina-Romero et al., 2024). Moreover, HR professionals are tasked with fostering digital literacy across the workforce to ensure alignment with strategic digital initiatives and sustainability goals (Hornungová & Petrová, 2025; Andestari et al., 2024). Thus, digital transformation acts as a catalyst that encourages employees and organizations alike to develop and enhance digital competencies essential for competitiveness and sustainable HRM.

Proposition 1: Digital transformation positively influences the development of digital competencies within organizations

Digital competencies affect sustainable HRM

Digital competencies are increasingly recognized as essential enablers of sustainable HRM because they enhance both the strategic and operational capacities of organizations to align digital transformation with sustainability goals. Employees equipped with digital skills, such as data-driven decision-making, AI-based HR analytics, and technology-enabled collaboration, are more capable of fostering HR practices that support long-term organizational resilience and sustainability (van den Berg et al., 2020; Zhang et al., 2024). Furthermore, the development of digital competencies encourages continuous learning, adaptability, and innovation, which are critical for embedding sustainable practices within HRM functions, including talent management, training, and employee engagement (Andestari et al., 2024; Espina-Romero et al., 2024). HR professionals play a pivotal role in this process by cultivating digital literacy across the workforce, thereby promoting inclusive, ethical, and environmentally responsible HR strategies (Hornungová & Petrová, 2025; Lukita et al., 2024). As organizations navigate the challenges of the digital era, such as rapid technological change and sustainability pressures, digital competencies serve as a bridge linking digital transformation to sustainable HRM practices.

Proposition 2: Digital competencies positively influence sustainable human resource management by enabling organizations to integrate technological advancement with sustainability-driven HR practices

Digital transformation affects sustainable HRM

Digital transformation has become a critical driver in reshaping sustainable human resource management (HRM) by fundamentally altering how organizations design, implement, and monitor HR practices to align with long-term sustainability objectives. Through the integration of digital technologies such as e-HRM systems, artificial intelligence, and data analytics, organizations can enhance recruitment, training, performance evaluation, and employee engagement processes while embedding sustainability principles within these functions (Fenech et al., 2019; Alqarni et al., 2023). Furthermore, digital transformation strengthens organizational agility, enabling HRM to respond proactively to ESG requirements, while promoting inclusivity, efficiency, and innovation in workforce management (Lou et al., 2024; Hornungová & Petrová, 2025). By leveraging digital tools, HR departments can reduce resource consumption, foster green practices, and create future-ready workplaces that balance technological progress with human and environmental well-being (Sharma & Kohli, 2023; Singh et al., 2025). Therefore, digital transformation not only modernize HR systems but also acts as a strategic enabler of sustainable HRM by integrating digital and sustainability imperatives into organizational strategy.

Proposition 3: Digital transformation positively influences sustainable human resource management by embedding digital technologies into HR practices that drive organizational efficiency, innovation, and sustainability

Mediating Role of digital competencies on the relationship between digital transformation and sustainable HRM

Digital competencies are widely recognized as the essential mediating mechanism through which digital transformation initiatives translate into sustainable HRM practices. While digital transformation introduces advanced technologies and reshapes HR processes, its effectiveness largely depends on the workforce's ability to acquire, apply, and adapt digital skills to support long-term sustainability goals (Lukita et al., 2024; van den Berg et al., 2020). Competencies in areas such as data analysis, change management, and digital literacy enable HR professionals to strategically align technological adoption with green and sustainable practices (Zhang et al., 2024). Without the development of digital competencies, digital transformation risks being a superficial technological upgrade rather than a driver of sustainable value creation (Espina-Romero et al., 2024). Moreover, digital competencies empower employees and HR leaders to integrate ethical and sustainability considerations, ensuring that digital tools foster innovation, inclusivity, and resilience within the workforce (Mykhailovska et al., 2025; Arora et al., 2024). Therefore, digital competencies act as the bridge that connects digital transformation with the realization of sustainable HRM outcomes by ensuring that technological advancements are effectively implemented as part of HR strategies and practices.

Proposition 4: Digital competencies mediate the relationship between digital transformation and sustainable HRM, such that higher digital competencies strengthen the positive effect of digital transformation on sustainable HRM

CONCLUSION

This study develops a conceptual framework that positions digital competencies as a mediating factor linking digital transformation and sustainable HRM. The framework highlights that while digital transformation establishes the technological foundation for sustainability, the realization of this potential in practice depends largely on the development of relevant digital skills and competencies. Through the integration of these dimensions, the study demonstrates how organizations can effectively align technological innovation with sustainability-oriented HRM objectives. From a theoretical standpoint, this research extends existing HRM and sustainability literature by introducing digital competencies as a bridging construct that connects technological advancement with human-centered sustainability outcomes. Furthermore, it enriches traditional HRM theories by conceptualizing digital competencies not merely as operational tools but as strategic assets that enhance organizational adaptability, innovation, and long-term sustainability.

In addition, this framework offers valuable practical implications for HR professionals and organizational leaders. It emphasizes the importance of developing digital competencies through structured training programs, continuous learning opportunities, and adaptive talent management strategies. Organizations that integrate digital literacy and adaptability into their HR practices are more likely to achieve workforce sustainability, promote environmental responsibility, and secure a lasting competitive advantage. However, as a conceptual paper, this study is inherently limited by the absence of empirical testing, which may restrict the generalizability of its propositions.

Therefore, future research should focus on empirically validating the proposed model using a combination of quantitative approaches, such as structural equation modelling, and qualitative methods, such as case studies, to examine its relevance across different industries and cultural contexts. Moreover, longitudinal investigations could provide further insights into how the relationship between digital transformation, digital competencies, and sustainable HRM evolves over time. Future studies should also consider ethical dimensions, including digital inclusion, employee well-being, and data privacy, to enhance the comprehensiveness and practical relevance of the framework. Overall, this study not only advances the theoretical discourse on sustainable HRM but also raises new questions about how digital competencies can serve as the key link connecting technological innovation to human-centered sustainability in organizational practice.

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