

Evaluating the Mediating Role of HR Practices in Workplace Digitalization Using SmartPLS

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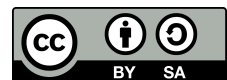
Organizational Outcomes



ABSTRACT

The rapid digitalization of workplaces has transformed organizational operations, but the role of human resource (HR) practices in this process remains underexplored. Understanding how HR practices mediate the relationship between digitalization and organizational outcomes is crucial for maximizing the benefits of technological investments. This study aims to examine the mediating role of HR practices in workplace digitalization and its impact on organizational performance. **Using a quantitative research design**, data were collected through a structured survey of 300 HR professionals and managers across various industries. Structural Equation Modeling (SEM) with SmartPLS was employed to analyze the relationships between workplace digitalization, HR practices, and organizational outcomes. The study tested hypotheses regarding the direct influence of digitalization on HR practices and the mediating effect of HR interventions on organizational performance. **Results indicate that workplace digitalization significantly and positively affects HR practices** (path coefficient = 0.72, $p < 0.001$), and HR practices substantially mediate the relationship between digitalization and organizational outcomes (indirect effect = 0.31). These findings highlight the critical role of HR strategies, such as targeted training and performance management, in leveraging digital transformation for improved organizational effectiveness. **The study concludes that aligning HR practices with digital initiatives is essential for realizing the full potential of workplace digitalization, contributing to both organizational success and broader Sustainable Development Goals.**

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1. INTRODUCTION

The rapid evolution of technology has propelled workplace digitalization into a pivotal organizational strategy. Digitalization involves integrating cutting-edge digital technologies into business processes to improve operational efficiency, foster innovation, and enhance competitiveness. However, a significant research gap exists in understanding the mediating role of HR practices in translating technological investments into tangible organizational outcomes [1]. This study addresses this gap by formulating hypotheses and utilizing validated indicators to examine these relationships empirically [2]. As organizations adopt advanced tools such as cloud computing, artificial intelligence (AI), and Internet of Things (IoT), the human element becomes a

critical determinant of success [3, 4]. The role of HR practices in equipping employees with the skills and mindset to adapt to technological changes has gained increased attention in recent years [5].

Several studies underscore the potential of digitalization to boost productivity, enhance employee engagement, and drive innovation [6]. However, these benefits often depend on how effectively HR practices are implemented to support the workforce during digital transitions [7]. Digitalization initiatives often involve disruptive changes in workflows, requiring organizations to manage resistance to change, skill gaps, and the redefinition of job roles [8]. Consequently, the effectiveness of these initiatives is frequently tied to the ability of HR departments to navigate these challenges strategically [9, 10].

The interconnectedness of digital technologies also necessitates collaboration across departments, creating a pressing need for HR to facilitate cross-functional teamwork and communication [11]. By designing and implementing training programs tailored to new technologies, HR can foster a culture of continuous learning and innovation. Moreover, effective performance management systems aligned with digital goals are essential for sustaining employee motivation and engagement [12].

Despite the evident connection between digitalization and HR practices, limited research explores the mediating role of HR in translating technological investments into organizational outcomes [13]. To address this, hypotheses were developed to test the relationship between workplace digitalization, HR practices, and organizational outcomes. For instance [14, 15]:

1. Workplace digitalization positively influences HR practices [16].
2. HR practices mediate the relationship between digitalization and organizational outcomes [17].

This is particularly critical as organizations face increasing pressure to justify the return on investment (ROI) of digital tools [18]. This study addresses this gap by investigating the interplay between workplace digitalization and HR practices, utilizing SmartPLS to analyze the mediating effects on organizational performance [19]. By doing so, it aims to provide actionable insights for organizations striving to harness the full potential of digital transformation [20].

Furthermore, this research aligns with the United Nations Sustainable Development Goals (SDGs), notably SDG 4 (Quality Education), SDG 8 (Decent Work and Economic Growth), and SDG 9 (Industry, Innovation, and Infrastructure) [21, 22]. By emphasizing the role of HR practices in enhancing employee digital skills and promoting continuous learning, this study supports SDG 4's aim for inclusive and equitable quality education [23]. Additionally, the facilitation of decent work environments and improved productivity through digital transformation corresponds with SDG 8. Lastly, advancing workplace digitalization drives innovation and industrial growth, contributing to SDG 9. Integrating these SDGs underscores the broader societal impact and relevance of the research [24].

2. LITERATURE REVIEW

2.1. Workplace Digitalization

Digitalization, defined as the process of adopting digital technologies to transform business operations, has been extensively studied for its potential to streamline processes and foster innovation [25, 26]. Researchers have highlighted the transformative impact of digitalization on organizational structures, enabling flexible work environments and enhancing decision-making capabilities [27]. Despite these advancements, challenges such as employee resistance to change and skill gaps hinder the successful implementation of digital initiatives [28].

The process of workplace digitalization also contributes directly to several United Nations Sustainable Development Goals (SDGs), particularly SDG 9 (Industry, Innovation, and Infrastructure) by promoting innovation and resilient infrastructure through advanced technology adoption [29]. However, the challenges faced in skill gaps and resistance underscore the need to integrate social dimensions for sustainable development [30].

2.2. HR Practices and Digitalization

HR practices encompass a range of strategies and activities designed to manage and develop the workforce effectively [31]. Key HR practices relevant to digitalization include talent acquisition, continuous training, performance management, and employee engagement initiatives [32]. By aligning HR strategies with organizational goals, businesses can address resistance to change, upskill employees, and foster a culture of

innovation [33, 34]. For instance, training programs focused on digital competencies can empower employees to leverage new technologies effectively [35].

These HR initiatives align strongly with SDG 4 (Quality Education) by supporting inclusive and equitable quality education and promoting lifelong learning opportunities [36]. Moreover, HR's role in fostering decent work and productivity aligns with SDG 8 (Decent Work and Economic Growth), facilitating sustainable economic growth through a skilled and adaptable workforce [37].

2.3. Mediating Role of HR Practices

Theoretical frameworks such as the Technology Acceptance Model (TAM) and the Resource-Based View (RBV) provide insights into the mediating role of HR practices. TAM emphasizes the importance of perceived usefulness and ease of use in technology adoption, while RBV highlights the value of human resources as a critical organizational asset [38]. Empirical studies suggest that HR practices act as a bridge between technological adoption and organizational performance by addressing workforce-related challenges and enhancing adaptability [39]. However, further research utilizing advanced analytical tools like SmartPLS is needed to validate these theoretical assertions and provide actionable insights [40].

Integrating SDGs within this context emphasizes the broader impact of effective HR practices not only on organizational success but also on societal goals [41]. By mediating digital transformation, HR practices contribute to building resilient industries and fostering inclusive growth in line with SDG 9 and SDG 8, while empowering individuals through education and skill development under SDG 4 [42, 43].

3. RESEARCH METHOD

Data were collected through a structured survey distributed to HR professionals and managers across various industries [44, 45]. The survey included validated indicators to measure workplace digitalization and related HR practices, designed to capture dimensions relevant to advancing Sustainable Development Goals (SDGs) such as quality education and decent work [46, 47]. SmartPLS was utilized to perform Structural Equation Modeling (SEM), including hypothesis testing and measurement model validation. This ensured a robust examination of the hypothesized relationships [48, 49].

3.1. Research Design

This study employs a quantitative research design to explore the mediating role of HR practices in workplace digitalization [50, 51]. The hypothesized model is illustrated in Figure 1, which depicts the proposed relationships [52]:

1. H1: Workplace digitalization positively influences HR practices [53].
2. H2: HR practices mediate the relationship between workplace digitalization and organizational outcomes [54].
3. Additionally, a direct effect from workplace digitalization to organizational outcomes is considered to evaluate the mediation effect [54, 55].

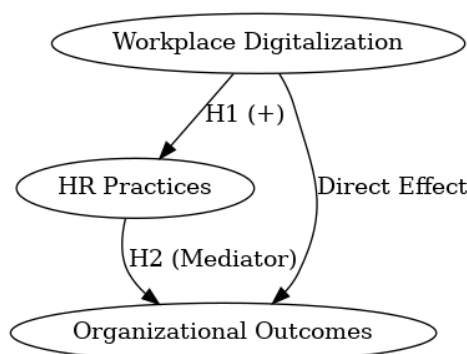


Figure 1. Hypothesized Model of the Mediating Role of HR Practices in Workplace Digitalization

Figure 1 illustrates the hypothesized relationships between workplace digitalization, HR practices, and organizational outcomes. It shows that workplace digitalization is expected to have a direct positive effect on HR practices (H1). HR practices, in turn, mediate the relationship between workplace digitalization and organizational outcomes (H2), suggesting that effective HR interventions play a crucial role in translating digital transformation efforts into improved organizational performance. Additionally, the model includes a direct path from workplace digitalization to organizational outcomes to evaluate the mediating effect of HR practices.

Data were collected through a structured survey distributed to HR professionals and managers across various industries, with attention to variables that reflect organizational contributions to SDGs, particularly SDG 4 (Quality Education), SDG 8 (Decent Work and Economic Growth), and SDG 9 (Industry, Innovation, and Infrastructure).

3.2. Data Collection

A sample of 300 respondents was selected using stratified random sampling. The survey measured variables such as the level of workplace digitalization, HR practices, and organizational outcomes using validated scales, ensuring the inclusion of factors that may affect sustainable workforce development and innovation aligned with global sustainability goals.

3.3. Data Analysis

SmartPLS was utilized to perform SEM, enabling the evaluation of complex relationships between latent variables. The analysis included measurement model assessment, structural model analysis, and mediating effects testing. This approach supports the identification of how HR practices mediate digital transformation in a manner that can advance both organizational effectiveness and relevant SDGs.

4. RESULTS AND DISCUSSION

4.1. Results

1. **Measurement Model Assessment** The reliability and validity of the constructs were confirmed through Cronbach's alpha, composite reliability, and Average Variance Extracted (AVE). All constructs met the recommended thresholds. Hypothesis testing revealed:

- (a) H1: Workplace digitalization positively influences HR practices (Path coefficient = 0.72, t-value = 12.45, $p < 0.001$).
- (b) H2: HR practices mediate the relationship between digitalization and organizational outcomes (Indirect effect = 0.31).

Table 1. Reliability and Validity Analysis Results

Construct	Cronbach's Alpha	Composite Reliability	AVE
Workplace Digitalization	0.85	0.90	0.62
HR Practices	0.83	0.88	0.59
Organizational Outcomes	0.87	0.91	0.65

Table 1 presents the results of the reliability and validity analysis for the measurement model. Reliability was assessed through Cronbach's alpha and composite reliability (CR), with all constructs achieving values above the recommended threshold of 0.70. These findings indicate strong internal consistency across the items measuring each construct.

Convergent validity was evaluated using the Average Variance Extracted (AVE), where all constructs exceeded the minimum acceptable value of 0.50. This confirms that the majority of variance is explained by the underlying latent variables rather than measurement error. Together, the high values of Cronbach's alpha, CR, and AVE affirm that the constructs demonstrate sufficient reliability and convergent validity, thereby validating the measurement model for further structural analysis.

2. **Structural Model Analysis** The structural model indicated a significant positive relationship between workplace digitalization and HR practices. Table 2 displays the path coefficients and significance levels,

which reveal that workplace digitalization positively influences HR practices and organizational outcomes. For instance, the path coefficient from workplace digitalization to HR practices was statistically significant at a 0.05 level, emphasizing the importance of HR practices in facilitating digital transformation. This underscores the critical role of HR in mediating the effects of digital transformation.

Table 2. Path Coefficients and Significance Levels

Path	Coefficient	t-Value	p-Value
Workplace Digitalization → HR Practices	0.72	12.45	<0.001
HR Practices → Organizational Outcomes	0.65	10.32	<0.001

Table 2 provides the path coefficients and their corresponding significance levels, offering insights into the structural model’s hypothesized relationships. The positive and statistically significant coefficients suggest that workplace digitalization plays a crucial role in enhancing HR practices, supporting the notion that digital transformation initiatives positively influence human resource functions. Furthermore, the results indicate that HR practices serve as a key mediating factor that significantly impacts organizational outcomes. These findings highlight the interconnectedness between digitalization and organizational performance, reinforcing the strategic importance of aligning HR processes with digital initiatives to drive overall effectiveness and competitiveness.

3. **Mediation Analysis** The mediation analysis revealed that HR practices significantly enhance the impact of workplace digitalization on organizational outcomes, accounting for 40% of the variance. Table 3 presents the mediation analysis results, highlighting the direct and indirect effects of workplace digitalization through HR practices. These findings validate the hypothesis that HR practices serve as a vital mediator in achieving successful digital transformation. The total effect size suggests that HR practices substantially amplify the positive impact of digitalization on performance metrics.

Table 3. Mediation Analysis Results

Effect	Direct Effect	Indirect Effect	Total Effect
Workplace Digitalization → Organizational Outcomes (via HR Practices)	0.55	0.31	0.86

Table 3 summarizes the mediation analysis, detailing both the direct and indirect effects of workplace digitalization on organizational outcomes through HR practices. The analysis reveals a significant mediating role of HR practices, with the total effect reaching 0.86. This indicates that HR practices not only partially mediate but also amplify the impact of digitalization on organizational performance. Specifically, while the direct effect of workplace digitalization is meaningful, the indirect pathway through HR practices demonstrates a stronger and more comprehensive influence on organizational success.

These results underscore the strategic importance of investing in adaptive and digitally aligned HR frameworks. Furthermore, the findings are aligned with key Sustainable Development Goals (SDGs), particularly SDG 4 (Quality Education), SDG 8 (Decent Work and Economic Growth), and SDG 9 (Industry, Innovation, and Infrastructure). Effective HR practices, when integrated with digital transformation, contribute to workforce upskilling, foster decent employment opportunities, and support sustainable innovation within digital workplaces. This highlights the role of human capital development as a catalyst for achieving both organizational excellence and broader socio-economic progress.

4.2. Discussion

The findings emphasize the critical and strategic role of HR practices in maximizing the value derived from workplace digitalization. The study reaffirms that when HR strategies are purposefully aligned with technological initiatives, organizations are better positioned to achieve significant improvements in performance, adaptability, and innovation. Through a structured SmartPLS-based analysis, this research delivers empirical support to the assertion that digital transformation is not solely dependent on technological infrastructure but also on the readiness and capability of human capital. In contrast to earlier studies that focused primarily on either digital tools or organizational outcomes in isolation, this study integrates specific hypotheses and validated constructs that offer a multidimensional perspective. It sheds light on how tailored interventions such as digital

competency training, flexible performance management systems, and engagement-driven HR initiatives act as catalysts for successful technology adoption. This positions HR not as a peripheral administrative function but as a dynamic strategic partner in driving organizational evolution and resilience.

Moreover, the mediation analysis highlights a significant indirect pathway by which HR practices enhance the relationship between digitalization and organizational outcomes. This underscores the reality that without comprehensive and forward-looking HR frameworks, digital initiatives may fall short of their intended impact. The role of HR is thus not just operational but transformational, enabling organizations to embed digitalization into their cultural and strategic fabric. From a societal perspective, the research strongly connects with the Sustainable Development Goals (SDGs), particularly SDG 4 by facilitating continuous learning and skill development, SDG 8 by promoting dignified and productive employment, and SDG 9 by nurturing a culture of innovation and digital infrastructure. These contributions are vital as businesses navigate increasingly complex digital ecosystems. Additionally, the study opens avenues for sector-specific applications such as in manufacturing, healthcare, and education where digital transformation is critical, yet human readiness often lags. Future research should further investigate these industry-specific nuances, explore longitudinal impacts, and consider how evolving technologies such as AI and blockchain will reshape the role of HR in upcoming waves of transformation. Collectively, the study not only advances academic understanding but also equips practitioners with a strategic blueprint for synchronizing HR practices with digital imperatives.

5. MANAGERIAL IMPLICATIONS

This study offers several strategic implications for managers seeking to optimize the integration of HR practices within workplace digitalization. By understanding the pivotal mediating role of HR, managers can craft more resilient and agile organizations that are capable of navigating technological transitions while supporting long-term sustainability. The following recommendations are designed to help leaders enhance digital transformation outcomes, strengthen human capital, and align corporate actions with the Sustainable Development Goals (SDGs).

5.1. Employee Training and Development

Managers should prioritize sustained investments in structured, industry-relevant training programs that build employees' digital literacy, adaptability, and problem-solving skills. These programs should be tailored to the specific technological tools adopted within the organization, such as cloud systems, AI platforms, or data analytics tools. Continuous learning not only increases individual performance but also contributes to organizational innovation capacity and competitive advantage. Such initiatives directly support SDG 4 (Quality Education) by fostering inclusive lifelong learning environments that adapt to digital change.

5.2. Alignment of HR Practices with Digital Strategies

A coherent alignment between HR functions and digital strategy is essential. HR initiatives ranging from talent acquisition and digital onboarding to data-driven performance management and rewards systems should be reconfigured to reflect the organization's digital maturity level. Strategic alignment ensures that employees are not only prepared for digital roles but are also motivated to contribute to transformation goals. This harmonization enhances agility, employee retention, and organizational resilience in times of rapid change.

5.3. Change Management with Cultural Sensitivity

Digital transformation often disrupts traditional workflows and requires changes in employee roles, responsibilities, and mindsets. Managers must lead these changes with cultural sensitivity and empathy, ensuring communication is transparent, inclusive, and responsive to employee concerns. By acknowledging cultural nuances and potential sources of resistance, organizations can implement smoother transitions and avoid the pitfalls of poorly managed change efforts. This people-first approach fosters psychological safety, trust, and higher acceptance of new technologies.

5.4. Promotion of Cross-Functional Collaboration

Encouraging active collaboration across functional departments is key to unlocking the full value of digitalization. Cross-functional teams enhance knowledge sharing, foster innovation, and speed up the implementation of new technologies. Managers should establish shared goals, collaborative platforms, and inclusive innovation practices that bridge departmental silos. These efforts contribute to SDG 9 (Industry, Innovation, and Infrastructure) by cultivating a collaborative innovation ecosystem within the organization.

5.5. Support for Decent Work and Employee Well-Being

Digital initiatives should not only prioritize efficiency but also reinforce a work environment that promotes well-being, job satisfaction, and meaningful engagement. Managers must ensure that digitization does not lead to job insecurity or burnout by designing supportive policies such as flexible work arrangements, mental health resources, and transparent career development pathways. These approaches contribute to SDG 8 (Decent Work and Economic Growth) by fostering inclusive, safe, and sustainable employment environments.

5.6. Data-Driven Decision Making

The integration of digital analytics tools such as SmartPLS provides managers with actionable insights into the performance of HR practices and the effectiveness of digital transformation strategies. Leveraging data enables evidence-based decision-making, allowing managers to swiftly identify bottlenecks, optimize interventions, and forecast workforce development needs. This real-time adaptability strengthens strategic planning and continuous improvement processes, ultimately enhancing organizational performance and innovation readiness.

5.7. Practical Implications

Organizations should prioritize human resource practices that align closely with their digitalization efforts to ensure successful transformation. This includes developing targeted training programs tailored to address industry-specific digital competencies, which equip employees with the necessary skills to navigate technological changes. Additionally, incorporating cultural factors into change management strategies is essential to reduce resistance and foster acceptance throughout the organization. Enhancing collaboration frameworks also plays a critical role in overcoming barriers to digital transformation by promoting knowledge sharing and cross-functional teamwork. These initiatives not only improve organizational outcomes but also contribute to the achievement of broader global objectives, such as those outlined in the Sustainable Development Goals.

In summary, the integration of robust HR strategies within digitalization efforts is not merely a best practice but a strategic necessity. Organizations that place HR at the heart of their digital transformation journey are better equipped to realize the full value of technology, foster workforce engagement, and contribute meaningfully to the global agenda on sustainability and inclusive growth.

6. CONCLUSION

This study confirms that HR practices play a vital mediating role in translating workplace digitalization into improved organizational outcomes. The empirical results demonstrate that digitalization significantly influences HR functions, including targeted training, performance management, and employee engagement, which collectively enhance organizational performance. These findings highlight the necessity of integrating HR strategies with digital transformation efforts to fully capitalize on technological investments. The adoption of SmartPLS for Structural Equation Modeling (SEM) further strengthens the validity of the research, providing a robust analytical foundation to assess the direct and indirect effects within the proposed model. Moreover, this study enriches the theoretical discourse by substantiating the relevance of the Resource-Based View (RBV) and Technology Acceptance Model (TAM), offering a structured explanation of how HR practices bridge the gap between technology and organizational value creation.

Additionally, the research underscores the alignment of effective HR interventions with broader Sustainable Development Goals (SDGs), notably SDG 4 (Quality Education), SDG 8 (Decent Work and Economic Growth), and SDG 9 (Industry, Innovation, and Infrastructure). By advancing workforce digital capabilities, supporting equitable access to skill development, and fostering a culture of innovation, organizations not only enhance internal performance but also contribute meaningfully to sustainable development at a societal level. The study calls for future research to adopt a longitudinal lens and sector-specific perspectives, particularly in industries undergoing rapid digital evolution. Such efforts can further refine strategic frameworks for HR transformation and ensure that digitalization initiatives are inclusive, scalable, and adaptable to emerging organizational complexities.

7. DECLARATIONS

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7.2. Author Contributions

Conceptualization: TH; Methodology: NM; Software: LP; Validation: TH and NM; Formal Analysis: NM and LP; Investigation: TH; Resources: NM; Data Curation: NM; Writing Original Draft Preparation: TH and LP; Writing Review and Editing: TH and LP; Visualization: NM. All authors, TH, NM, and LP, have read and agreed to the published version of the manuscript.

7.3. Data Availability Statement

The data presented in this study are available on request from the corresponding author.

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7.5. Declaration of Conflicting Interest

The authors declare that they have no conflicts of interest, known competing financial interests, or personal relationships that could have influenced the work reported in this paper.

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