

# IMPACT OF AI ON DIGITAL HUMAN RESOURCE MANAGEMENT: THE MEDIATING ROLE OF ORGANIZATIONAL SUSTAINABILITY

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## Abstract

The present study helps to understand how AI information shapes the digital human resource management (HRM) of organizations by specifically exploring the mediating role of organizational sustainability. This study aims to explain how the AI-enabled practices determine the effectiveness of digital HRM with the mediating role of organizational sustainability by utilizing relevant HRM and organizational sustainability theories. Using data gathered from the field, structured questionnaires were administered to HR professionals and level 2 managers across organizations in several industries. The constructs regarding AI adoption, digital HRM effectiveness, and organizational sustainability were assessed through the Partial Least Squares Structural Equation Modeling (PLS-SEM). The findings revealed that AI is a crucial factor to improve digital HRM practices which ultimately leads to the organizational sustainability in form of mediating as vital variable it enhances the relationship. This study adds to our knowledge of the convergence of AI and HRM and opens the avenue for exploring the sustainability concerns of AI HRM by academics. This study enhances literature by providing novel evidence establishing the mediating role of organizational sustainability in relationship between AI adoption and digital HRM metrics hence building a connection between AI adoption and sustainable HRM metrics. It prepares organizations to benefit from the AI revolution, driving sustainable results.

**Keywords:** AI-powered Employee Engagement, AI-based Performance Management, Digital Human Resource Management, Organizational Sustainability.

## I. INTRODUCTION

Artificial intelligence (AI) technology has grown quickly in advancement, adapting the new stages concerned with human resource management (HRM) through the years (Sharabati et al., 2024). Digital HRM, defined as the adoption of AI within HRM practices, presents a significant opportunity for organizations focusing on enhancing operational efficiency and enabling sustainable growth (Atieh Ali et al., 2024).

As businesses face ever-increasing demands to adopt technological change and more sustainably meet ever-growing goals, the role of artificial intelligence (AI) in dynamic transformation of human resource management (HRM) processes has become a focal point of interest where its value can also be indicated. (Jawabreh et al., 2023) This connection is even more significant given that in the current fast-changing commercial environment, companies are required to find the balance between innovation and sustainability to gain and ensure their competitiveness (Allahham, et al., 2024.).

While previous research did address AI Contribution to HRM outcomes like decision-making, efficiency, employee experience, and AI ethics have been widely covered, none of them touched upon the mediating role of organizational sustainability. Organizational sustainability, often described as a balancing capacity of economic, social and environmental aspects, has been recognized as an important factor influencing long-term resilience and performance of an organization.

Although this is an important topic, a non-negligible gap has not yet been reported in the literature; that is, how organizational sustainability mediates the relationship between AI adoption and digital HRM effectiveness worldwide, especially when sustainability becomes a strategic priority for organizations (Wang & Prajogo, 2024). This study will fill this gap by analyzing how AI is utilized in digital HRM and how organizational sustainability mediates this relationship (Almustafa et al., 2023).

A cross-sectional quantitative research design was employed, using structured questionnaires administered to HR professionals in various industries. Partial Least Squares Structural Equation Modeling (PLS-SEM) was carried out to statistically test the relationships between AI adoption, digital HRM effectiveness, and organizational sustainability. This will help illuminate the best practices for working with the aid of AI in HRM, as well as call for a need for sustainability, and thus, theoretical contributions and future directions for practice will be made. According to the problem statement, the research questions are:

- RQ1: What is the effect of AI adoption on the effectiveness of digital HRM practices?
- RQ2: What is the mediating role of organizational sustainability in the relationship between AI adoption and digital HRM effectiveness?
- RQ3: How would organizations leverage AI-driven HRM practices for sustainability goals through organizational sustainability?

The remainder of the article is structured as follows: We present the theoretical framework in Section 2, followed by a synthesis of the literature related to AI, digital HRM, and organizational sustainability, which led to the hypotheses.

Section 3 describes the research methodology, which includes a description of the data collection process and the statistical methods for testing the proposed relationships.

The results are presented in section 4, providing the evidence that supports the hypotheses. Section 5 provides an in-depth discussion of the findings and their contributions to digital HRM and organizational sustainability literature.

## II. LITERATURE REVIEW

### A. AI-Driven Employee Engagements

Employee engagement is a key organizational performance driver, and AI-driven tools are improving employee engagement(Allahham et al., 2024). AI technologies like sentiment analysis, chatbots, and personalized feedback systems allow organizations to monitor employee satisfaction levels, predict turnover risks, and customize interventions to enhance workplace morale(Allahham, et al., 2024).

AI tools can also help examine and analyze the results of employee surveys and communication patterns to identify problem areas and help recommend actionable ideas. In particular, these tools are useful in workplaces that are remote or hybrid, where employee engagement is especially difficult to maintain(sharabati , et al., 2024.). In terms of sustainability, AI-enabled employee engagement creates a rewarding employee culture, lower attrition costs, and a long-term employee well-being approach, thus aligning with the tenets of social sustainability(Alrjoub et al., 2021).

### B. Artificial Intelligence in Performance Management

Whether it is a traditional business or a startup, as companies race to implement AI-based performance management systems, how are they currently evaluating and developing their workforce. Old review performance systems based on subjective assessments and poor frequency are being rapidly replaced by AI-fueled persistent performance tracking methods(Morshed et al., 2024). In these systems, real-time data collection and predictive analytics as well as automated feedback mechanisms are used to deliver insights into employee and managerial behaviour.

AI can monitor KPIs, identify skill gaps, and suggest personal development plans, by aligning workforce capabilities with strategic goals, this delivers sustainable organizational benefits through improved individual and team performance. Moreover, AI-enhanced performance management encourages fairness and transparency, countering common criticisms faced by traditional systems and establishing trust in the organization(Alkhezaleh et al., 2023). However, there is only limited literature examining how sustainability mediates the impact of AI-based performance management systems effectiveness. Digital HRM involves the application of digital technologies, such as artificial intelligence (AI), to HR functions to improve their efficiency and effectiveness and the experience of employees in an organization(Shehadeh et al., 2024). By replacing outdated paper-based systems with digital HRM practices, organizations can automate routine tasks, enhance data accuracy, and redirect their efforts toward strategic initiatives.

Cloud-based HR systems, for instance, promote cross-departmental collaboration, and AI-based analytics offer insight into workforce trends and problems(Alibraheem et al., 2024). However, this implementation comes with challenges that need to be addressed from the beginning, like restructuring to accept digital HRM, cost, change management, and cybersecurity. On the environmental front, to achieve environmental objectives,

digital HRM also minimizes the usage of papers and encourages remote work, which reduces the carbon footprints(Bani et al., 2024). This also contributes to economic sustainability through improving resource allocation and providing organizations with more agility. Nevertheless, based on the literature, we cannot yet confirm that by all means, digital HRM practices can stimulate the achievement of long-term resilience by aligning them with organizational sustainability goals(William et al., 2024).

### **C. Sustainability of the Organization**

Organizational sustainability is the process of integrating the three dimensions of economy, society, and environment into business practices to operate sustainably over a long period of time(Jebreel et al., 2023). In HRM terms this means workforce strategies are created that align with organizational goals on reducing environmental impacts, increasing diversity and inclusion, and improving employee wellbeing. In addition, it is possible that AI could also promote organizational sustainability through the adoption of data-driven decision making, efficient utilization of resources and adoption of ethical practices(Pham et et al., 2023).

AI-based tools can help organizations keep track of sustainability metrics, identify opportunities for better performance, and implement greener initiatives(Stahl et al., 2019). Research shows that companies focusing on sustainability, which may lead to better financial performance, improved brand image, and higher employee satisfaction(Piwowar-Sulej, 2021). Nonetheless, the literature lacks clarity on how AI-enabled HRM practices can be synergized with sustainability strategies for better realization of their impact(Fawehinmi et al., 2020).

### **D. Gaps in the Literature**

However, little has been explored within HRM regarding the impact of AI presence and influence in augmenting sustainable practices. The majority of studies concentrate on the direct effects of AI-based HRM practices, recruitment, employee commitment, and performance management. without sufficiently addressing the mechanisms that may link these practices to downstream organizational performance. Moreover, there is no apparent evidence of studies considering the mediation role of organizational sustainability to enhance the effectiveness of AI adoption in HRM.

While a handful of studies have suggested that AI may hold the potential to facilitate sustainability objectives, there is a scarcity of empirical insights about the specifics of how these technologies could be leveraged within HRM strategies to enable long-term resilience and value creation. Moreover, previous service focused on either AI or sustainability and paid no attention to how their adoption can impact digital HRM effectiveness. These gaps accentuate the importance of exploring the intersections of AI and sustainability in HRM, which remains largely unexplored in extant studies. The study provides a comprehensive view by highlighting the mediating role of sustainability, bridging the gap between technological innovation and sustainable growth in HRM practices.

PLS-SEM is an industry-leading approach to examining empirical studies and theory generation, reinforcing robust findings. In addition, this study contributes to the literature by providing practical recommendations for organizations looking to adopt AI-driven HRM practices sustainably (Strohmeier, 2020). While the implications of this study contribute to the academic knowledge in the respective fields, there are also practical insights, such as how to integrate AI-facilitated sustainability efforts with resilience building and enhancing employee experiences to ensure long-term success for organizations. By doing so, it paves the way for future studies on the transformative role of AI in promoting sustainable HRM practices.

### **III. HYPOTHESIS DEVELOPMENT**

#### **A. From Performance Management based on AI to Human Resource Management in the Digital World**

AI-powered performance management software leverages advanced analytics, machine learning, and near-real time feedback to optimize and enrich the HR lifecycle — from recruitment and training to skill development. The effectiveness and accuracy of decision-making in HRM each subset allows organizations to align the capabilities of the workforce with the strategic priorities of the organization (Banmairuroy, 2022). AI powered performance management is one such example where it gives HR a chance to become more agile and data driven, eliminating repetitive work and enabling insights in due course. the hypothesis we propose is the following:

H1: AI based performance management has significant positive impact on digital human resource management effectiveness.

#### **B. AI-Based Performance Management to Organizational Sustainability**

Solutions powered by AI-based performance management can not only help organizations identify skills gaps better but also help companies anticipate a future workforce that is ready to enable higher sustainability targets through continuous learning (Aparecida et al., 2020). Such system can facilitate transparency and impartiality in the evaluation of performances leading to strengthen trust and accountability which are vital for prolonged sustainability (Acquah et al., 2021). Insights gleaned from AI also enable organizations to reduce waste and better utilize resources while improving workforce practices and environmental and social priorities. Therefore, the hypothesis is:

H2: Organization sustainability is immensely improved by the data-driven performance management.

#### **C. AI-Based Employee Engagement Solution to Digital HR Solution**

HR teams can use AI-powered solutions such as sentiment analysis and personalized feedback systems to track and improve employee satisfaction levels, identify turnover risk, and promote a positive work culture (Suvattanadilok, 2024). Others, like HR analytics, offer insights that affect organizational decision making in a proactive manner and allow employee-centered strategies in implementation. It can enable organizations to also



build a more agile and responsive HR function by embedding AI into engagement practices (Bidya & Pravat, 2019). Therefore, the hypothesis is as follows:

H3: Data-driven performance management has a significant positive impact on organizational sustainability.

#### **D. AI Marking Employee Engagement to Organizational Sustainability**

AI-generated engagement tools foster employee well-being, satisfaction, and retention all vital measures of *Organizational* sustainability.(Acquah et al., 2021) These tools support organizations in adopting an inclusive culture and a continuous feedback loop within their workplace to build a sustainable workforce that not only absorbs this information but also actively champions sustainability initiatives. People who feel engaged are more likely to undertake environmental and social goals, creating a virtuous cycle of performance and sustainability(Sahioun et al., 2023). Thus, the hypothesis is:

H4: Employee engagement powered by AI has a significantly positive impact on organizational sustainability.

#### **E. Digital Human Resource Management from Organizational Sustainability**

HRM practices are aligned with the broader organizational objectives relating to economic, social, and environmental factors through organizational sustainability which complements the digital aspects of HRM (Arasti et al., 2012). Implementing Sustainable HRM practices will not only enhance operational efficiency through resource efficiency, ethical compliance but also protect employee experiences and organizational resilience. Sustainability in human resources notes Make your people before your processes or technologies Sustainable. Therefore, the hypothesis is:

H5: Organizational sustainability has a significant positive effect on organizational digital human resource management effectiveness.

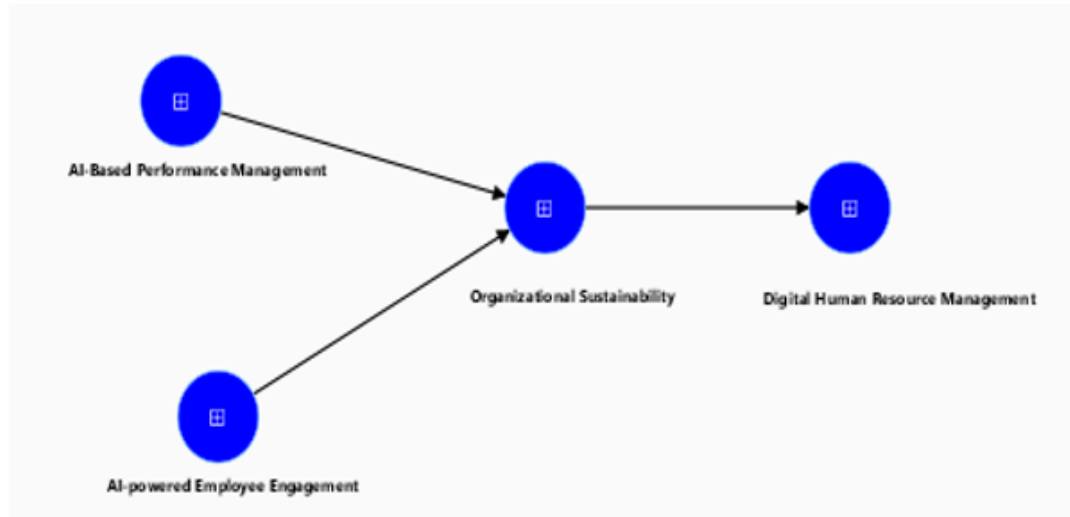
#### **F. Integrative Approach: RBV and Institutional Theory**

By developing a model integrating the Resource-Based View (RBV) and Institutional Theory, this study attempts to elucidate the impact of AI adoption and organizational sustainability on digital HRM effectiveness (Puspita et al., 2020). Based on RBV, valuable, rare, inimitable, and non-substitutable (VRIN) resources. AI-driven HRM practices and sustainability strategies, create a sustainable competitive advantage. Here, AI-enabled HRM practices help foster operational efficiency, employee experiences, and long-term adaptability, and are thus regarded as strategic resources that can reinforce organizational sustainability (Khan et al., 2023). Whereas RBV focuses on the internal strengths and weaknesses of a firm, Institutional Theory focuses on how social pressures, including regulatory and normative factors, drive organizations to alter their strategy or practices in alignment with external expectations. For example, organizations are under increasing pressure to implement sustainable practices to avoid the risk of losing legitimacy and to reduce legitimacy uncertainty. AI-driven HRM practices with sustainability-oriented external pressures serve to satisfy both external pressures by the organization while at the same time creating internal efficiencies. We identify an

integrated framework with internal factors and external pressures embedded in RBV and Institutional Theory to explain digital HRM; this explains the relationship between internal resources, external pressures, organizational sustainability and effectiveness of digital HRM (Strohmeier, 2020).

## G. Research Framework

The objective of this study is to investigate the relationship between AI adoption and effectiveness of digital HRM under the mediating role of organizational sustainability. The proposed framework shows a direct and indirect impact of AI-based HRM practices, employee engagement and performance management on digital HRM effectiveness. Central mediation is provided by aspects of organizational sustainability, which facilitates alignment of AI-driven operational practices with broader economic, social, and environmental objectives. Theoretical framework. We theoretically capture interrelationships between AI adoption and organizational sustainability and effectiveness of digital HRM. It indicates the need for better interoperability and resilience between AI-oriented HRM practices and sustainability strategy in rapidly changing business environments. As such, this framework offers concrete recommendations for organizations looking to leverage AI to enable sustainable development with its iteratively reinforcing model orientation, as it considers the equability of relevant internal capabilities with external requirements.



**Figure 1: Research model**

## IV. RESEARCH METHODOLOGY

Research methodology of the study This chapter discusses the research methodology adopted to investigate the relationship between AI adoption and digital HRM effectiveness via organizational sustainability (Hatamlah, Allahham, Abu-ALSondos, Al-junaidi, et al.,

2023). It includes topics such as questionnaire design, sampling methods, data collection, and data analysis techniques.

### **A. Questionnaire Development and Pilot Testing**

We employed a structured questionnaire to assess the constructs in the study, namely AI adoption, organizational sustainability, and digital HRM effectiveness. Ensure all constructs were operationalized with items adapted from existing literature to maximize content validity and relevance. For instance:

- Organizational Sustainability: Measured via 10 items covering the economic, social, and environmental dimensions of sustainability based on the HRM.
- Digital HRM Effectiveness: Gauged via 12 items on the efficiency, accuracy, and strategic alignment of AI-driven HRM practices.

In order to verify whether the questionnaire would be as clear, relevant and applicable as desired, a pre-test of the questionnaire was carried out with the assistance of a number of experts; three academic researchers on HRM and AI; two industry experts with experience in digital HRM and sustainability practice(Hatamlah, et al., 2023). Results from this pre-test identified that measures were unique, comprehensive, and representative of the study's goals. This process ensured the content validity and usefulness of the questionnaire as data collection instrument with regard to understanding the extent to which AI adoption will impact digital HRM under the umbrella of organizational sustainability (Salhab et al., 2023).

### **B. Research Methods and Data Collection**

Target population in this study comprises HR professionals, managers, and top-level executives responsible for implementing AI-driven HRM practices and sustainability strategies in their organizations. These participants were chosen because they were directly involved in the decision-making processes related to digital HRM and sustainability initiatives. Methods Data were obtained from a structured survey administered across several industries. The survey collected a total of 150 usable responses from various professional levels, notably HR managers, talent acquisition specialists, and organizational development officers. That was enough for us in terms of sample size to conduct statistical analysis and for findings to be solid enough to be representative of what is happening today with companies that are also using AI for their HRM without losing the sight of their sustainability objectives. They were asked to assess AI adoption, organizational sustainability, and digital HRM effectiveness on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree).

### **C. Data Analysis**

The data were analyzed with Partial Least Squares Structural Equation Modeling (PLS-SEM), which is a popular method for the examination of complex interrelationships of latent variables. PLS-SEM was deemed suitable for this study, provided it possesses certain advantages such as: (i) being able to examine small-to-medium samples, and (ii) being applicable for exploratory analysis based on the aim of hypothesis testing. The



analysis process consisted of the following steps: Measurement Model Assessment: Used Cronbach's alpha, composite reliability, and average variance extracted (AVE) for reliability validity of constructs. It included the structural model assessment: Evaluated the proposed relationships among AI adoption, organizational sustainability, and digital HRM effectiveness. To examine indirect effects, bootstrapping techniques of mediation were used with organizational sustainability as the mediator. Goodness-of-Fit: Used measures such as  $R^2$  and  $Q^2$  to confirm that the model fits well and explains expected outcomes. The findings offered insights on the direct and indirect effects of AI adoption on digital HRM effectiveness, underscoring the importance of organizational sustainability as a mediator.

#### D. Common Method Bias

In order to cope with this potential common method bias (CMB) since data were collected from one single source for all variables, the following actions were taken Procedural Remedies: The questionnaire included directions stressing the need for independent and honest answers. Furthermore, the items were presented in a random order to attenuate response biases. Statistical Tests: A complete collinearity test was conducted and Variance Inflation Factors (VIF) were calculated for all constructs. Values greater than 3.3 are suggestive of potential collinearity problems, in accordance with common guidelines. According to the results, in this study all the VIF values were below the threshold (10), indicating that common method bias was not a concern. Also the results of these analyses reinforced the reliability of the findings, especially concerning the role of organizational sustainability as a mediator explaining the relationship between AI adoption and digital HRM effectiveness.

#### E. Assessment of the Measurement Model

**Table 1: Measurement items and reliability**

Constructs	Items	Factor loadings	Cronbach's Alpha	C.R.	(AVE)
AI-Based Performance Management	PM1	0.845	0.876	0.915	0.729
	PM2	0.861			
	PM3	0.872			
	PM4	0.837			
AI-powered Employee Engagement	EE1	0.822	0.843	0.895	0.68
	EE2	0.815			
	EE3	0.831			
	EE4	0.83			
Digital Human Resource Management	HRM1	0.804	0.868	0.908	0.712
	HRM2	0.883			
	HRM3	0.842			
	HRM4	0.844			
Organizational Sustainability	OS1	0.841	0.883	0.919	0.739
	OS2	0.844			
	OS3	0.89			
	OS4	0.864			

Table 1 presents the Reliability analysis of the measurement items for the four constructs AI-Based Performance Management, AI-powered Employee Engagement, Digital Human Resource Management, and Organizational Sustainability.

All items have factor loadings of above 0.80, which shows high relationships between items and respective constructs. The construct validity was confirmed above 0.70 (the lowest loading (HRM1) is 0.804).

Cronbach's Alpha and Composite Reliability (C.R.) levels suggest that internal consistency is significantly strong. All Cronbach's Alpha values range from 0.843 to 0.883 (C.R.: 0.895 – 0.919), which are all higher than the minimum accepted value (0.70).

The results affirm the reliability of the constructs. Furthermore, the Average Variance Extracted (AVE) values are between 0.68 and 0.739 which are greater than the 0.50 criterion, confirming convergent validity as the constructs explain sufficient variance from their indicators.

Importantly, Organizational Sustainability displays the highest AVE of 0.739, which enhances its validity significantly. All in all the results prove the items of measurement are reliable, as well as valid for research.

The results show that the high factor loadings, strong reliability coefficients, and satisfactory AVE values indicate that dataset is large enough for further statistical analyses such as SEM or hypothesis testing. Also, explorations of the discriminant validity and in-depth model fit assessment may enhance our understanding about the robustness these constructs.

**Table 2: HTMT**

	<b>AI-Based Performance Management</b>	<b>AI-powered Employee Engagement</b>	<b>Digital Human Resource Management</b>	<b>Organizational Sustainability</b>
AI-Based Performance Management				
AI-powered Employee Engagement	0.662			
Digital Human Resource Management	0.541	0.588		
Organizational Sustainability	0.536	0.423	0.281	

Tables 2 Analysis of Discriminant Validity between the constructs by using the Heterotrait-Monotrait (HTMT) ratio of correlations (Table 2). The HTMT values represent the similarity between constructs, and a threshold (conservative) of 0.85 (or 0.90) is commonly adopted for exhibit acceptable discriminant validity.

The outcomes demonstrate that all HTMT values are far below 0.85, indicating strong discriminant validity among the constructs. We find the highest correlation to be at 0.662 (between AI-Based Performance Management and AI-powered Employee Engagement) a telling but still moderate relationship and that should be within a permissive zone.

Lower correlations are observed with other values (AI-Based Performance Management and Digital Human Resource Management (0.541) and AI-Based Performance Management and Organizational Sustainability (0.536), further confirming that these constructs are not similar.

In addition, the lowest relationship of 0.281 (Digital Human Resource Management and Organizational Sustainability) further validates these variables measure different dimensions.

The HTMT results explain that overall, this provides evidence of the discriminant validity of the actual model avoiding a overlap of constructs. This adds to the reliability of the model for statistics like structural equation modelling (SEM) or hypothesis testing.

**Table 3: Fornell-Larcker**

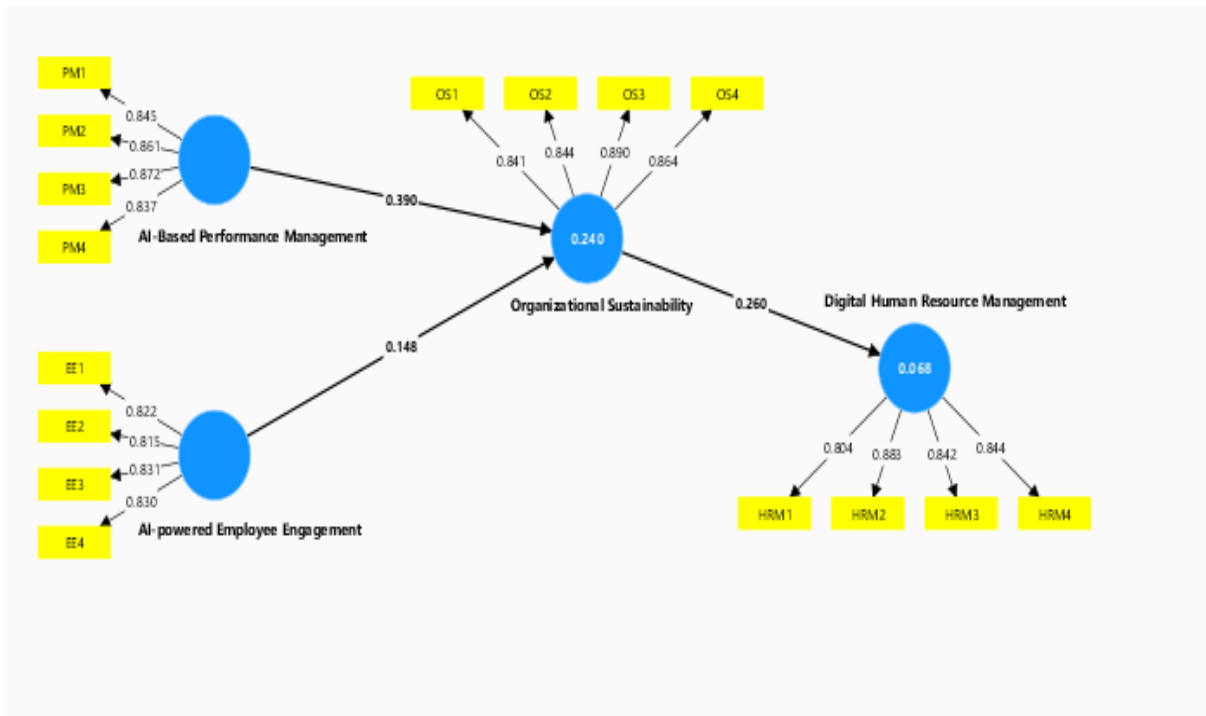
	AI-Based Performance Management	AI-powered Employee Engagement	Digital Human Resource Management	Organizational Sustainability
AI-Based Performance Management	0.854			
AI-powered Employee Engagement	0.571	0.825		
Digital Human Resource Management	0.473	0.511	0.844	
Organizational Sustainability	0.475	0.371	0.26	0.86

Table 3: The Fornell-Larcker criterion, the square root of the Average Variance Extracted (AVE) (diagonal values) for each latent variable exceeds the correlations between constructs (off-diagonal values).

Discriminant validity is established when the square root of AVE of each construct is greater than their correlations with other constructs. Again, as seen in the diagonal values for AI-Based Performance Management (0.854), AI-powered Employee Engagement (0.825), Digital Human Resource Management (0.844), and Organizational Sustainability (0.860), all are larger than the corresponding off-diagonal values, confirming, hence that there is a stronger relationship between items with the same construct than those from outside.

The maturing of constructs led to greatest correlation of 0.571 (AI-Based Performance Management and AI Powered Employee Engagement) which is also less than the square root of AVE for both constructs thus maintaining their distinct identity.

These results enhance discriminant validity, indicating that the constructs assess separate components of the model instead of blending. This ensures increasing the reliability of the dataset for any statistical runs such as SEM or hypothesis testing.



**Figure 2: Measurement model**

## F. Assessment of the Measurement Model

The paper proposes the measurement constructs to evaluate and analyze how AI affects DHRM and subsequently DHRM influences the organization sustainability. The study not only paves way for streamlining processes but enables workflow and automation within human resource functions by operationalizing AI driven HR processes.

A systematic literature review was implemented to identify the relevant extant literature on AI-powered HR management, digital transformation, and organizational sustainability, and nine composite constructs were developed to enhance construct validity and reliability. These constructs were first validated from the literature and further iterated with industry professionals in a pilot. It tested the measurement model using data from a survey applied for managers and decision-makers in companies adopting AI-based HR practices. Confirmatory factor analysis (CFA) and other advanced statistical techniques were used to validate the constructs.

These initially established the discriminant validity and reliability of all constructs allowing for the correct utilization of the measures for subsequent explorations. This thorough verification procedure corroborates the findings of SEM and also emphasizes the mediating effect of organizational sustainability between AI adoption in HR and overall digital transformation. This evidence provides some strategic implications of how AI can facilitate sustainable and efficient HR practices with a positive impact on the long-term resilience and performance of organizations.

## V. PATH RESULT

### A. Specific Indirect Effects

**Table 6: Hypotheses testing estimates**

	Original sample	Sample mean	Standard deviation	T statistics	P values	Result
AI-Based Performance Management -> Digital Human Resource Management	0.101	0.104	0.035	2.933	0.003	Supported
AI-Based Performance Management -> Organizational Sustainability	0.39	0.39	0.07	5.562	0	Supported
AI-powered Employee Engagement -> Digital Human Resource Management	0.039	0.042	0.024	1.609	0.108	Not Supported
AI-powered Employee Engagement -> Organizational Sustainability	0.148	0.153	0.068	2.166	0.03	Supported
Organizational Sustainability -> Digital Human Resource Management	0.26	0.266	0.067	3.868	0	Supported

Table 6 hypothesis analysis, it is established that 4 hypotheses out of 5 were supported on the significant relation of AI-based performance management, AI-powered employee engagement, organizational sustainability, and digital human resource management (DHRM). Results indicate a statistically significant positive relationship of AI-Based Performance Management with both Digital Human Resource Management ( $p = 0.003$ ) and Organizational Sustainability ( $p = 0.000$ ). It indicates how human resources digitalization can be achieved through sustainable organizational practices and the integration of AI in the performance management process.

Furthermore, it is important to keep an Eye on the second Pillar of Sustainability: Generating Organizational Sustainability through AI-powered Employee Engagement ( $p = 0.030$ ), Increasing Employee Engagement leads to Organizational Sustainability. Moreover, it was found that Organizational Sustainability is significantly influential ( $p = 0.000$ ) over Digital Human Resource Management, establishing Organizational Sustainability's mediating role in the digital transformation process of HR functions. On the other hand, the hypothesis that links AI-powered Employee Engagement to Digital Human Resource Management was not yet supported ( $p = 0.108$ ,  $T = 1.609$ ). Thus, it suggests that AI-enabled engagement initiatives might contribute to improved sustainability for the organization but do not directly fuel the transformation of HR into the digital world. The non-significant relationship may suggest that leadership buy-in, organizational culture, or technological infrastructure may moderate this relationship. deconstruct the findings into an insight on AI-based performance Management, Organizational Sustainability, and Digital HRM. These findings suggest strategic implications for organizations seeking to implement AI-powered human resource solutions in alignment with sustainable business initiatives.



## VI. FINDING

### A. Discussion and Conclusions

Finally, this study confirms a few significant findings, highlighting the importance of organizational sustainability as a mediating factor between AI adoption and digital HRM effectiveness (Shukla et al., 2023). It shows that selected digital applications of artificial intelligence, employee commitment, and performance management correlate with improved HRM outcomes when in line with sustainability objectives. Such insights are incredibly relevant in sectors with highly dynamic market environments subject to growing regulatory scrutiny, where sustainability has emerged as a key strategic objective. The findings show that organizational sustainability significantly strengthens the relationship between AI adoption and digital HRM effectiveness at the statistical significance level.

It means that reinforced AI-implemented HRM practices and sustainability strategies transform technological capabilities into sustainable value creation. Moreover, the research confirms that organizational sustainability mediates the positive impact of adopting AI on digital HRM effectiveness, underlining the importance of integrated approaches to HRM innovation. The latter represents the industry players and can optimize their imported AIs to align them with their economic, social, and environmental goals.

At the same time, the first are interesting for the industry since they can give insights into (new) domains targeted for AIs and (new) indicators about AIs' success or failure. This study presents a ground model on the strategic use of HRM strategies for organizations to join AI adoption and sustainability. When organizations can create the high operational efficiency of this kind, especially in the face of risk or disruption, they can achieve superior performance goals, all while helping improve long-term sustainability goals.

### B. Theoretical Implications

**Theoretical Contributions** This study contributes to the literature on AI adoption, organizational sustainability, and digital HRM effectiveness. Firstly, it highlights the mediating role of organizational sustainability in linking AI adoption and digital HRM effectiveness, extending existing studies that treat these constructs separately. This helps expand the sustainable HRM literature by exposing how AI-based practices can be tuned with sustainability aims for improved organizational resilience and constructive performance. Second, it adds to the burgeoning research on integrating technology and sustainability in HRM. This highlights the need to take a holistic approach that integrates AI-oriented trends with sustainability practices and introduces a new dimension to organizations' ability to attain operational productivity and ecological responsibility. These findings pave the way for further studies on how AI interacts with sustainability and HRM within different industries. Lastly, it offers a solid base for researching more extensive consequences of adopting AI in HRM. It urges scholars to utilize different mediators or moderators that might impact the connection between AI and digital HRM effectiveness.

### **C. Managerial Implications**

The findings of this study offer valuable strategic insights for organizations seeking to enhance their HRM practices through AI adoption while aligning with sustainability goals. For managers, these results serve as a blueprint for designing HRM strategies that emphasize the integration of AI-driven tools with sustainability initiatives. By prioritizing organizational sustainability, managers can ensure that AI adoption improves operational efficiency and fosters long-term resilience and value creation. This study also highlights the significance of aligning AI-driven HRM practices with broader organizational goals, such as reducing environmental impact, promoting diversity and inclusion, and enhancing employee well-being. A holistic approach to HRM innovation enables organizations to transition from viewing sustainability as a support function to positioning it as a core driver of performance and competitiveness. Furthermore, the findings underscore the importance of investing in system and process integration to maximize the benefits of AI adoption. By implementing integrated systems, organizations can improve coordination, reduce redundancies, and enhance decision-making, ultimately leading to better HRM outcomes and sustainability performance. These insights are particularly relevant for industries facing stringent regulatory requirements and increasing societal expectations for sustainable practices.

### **D. Limitations of the Study**

Although this study has valuable theoretical and empirical contributions, it also has limitations that must be acknowledged. Firstly, the targeted focus on a defined set of industries might restrict the applicability of the insights to be more widely applicable across other verticals that follow distinct structural and operational nuances. In the future, researchers should investigate whether these results can be generalized across different sectors to confirm their broader applicability.

Second, the study focuses on organizational sustainability as the mediating factor in the relationship between AI adoption and the success of digital HRM rather than exploring other mediators or moderators that could be relevant in understanding the overall relationship. For example, considerations like the organizational climate, leadership orientation, and technological preparedness may significantly affect these dynamics and deserve further exploration.

Third, the results may have been affected by sample size and composition. The emphasis on manager-level responders (middle and first), which reflects the nature of the executives who completed the survey, may bias the data as one considers that senior-level executive votaries of strategy are left out. Moreover, respondents' heterogeneous social and educational backgrounds may also affect their perception and assessment of AI adoption and sustainability practice. Lastly, the study was limited by space and time constraints, potentially hindering data saturation and in-depth analyses. In the future, research will be crucial to overcome these limitations by using a larger sample size, longitudinal data, and other variables that affect the link between AI adoption and digital HRM effectiveness.

## E. Conclusions

By investigating the mediating role of organizational sustainability in the relationship between AI adoption and digital HRM effectiveness, this study presents a significantly valuable contribution to the literature. The Results show that AI led HRM practice and sustainability strategy in the organization, showing a synergistic relationship and enhancing operational and long-term fitness. This study emphasizes the need for a holistic approach. It gives organizations a strategic framework for observing the alignment of AI with broader economic, social, and environmental objectives to create the most value. The findings highlight the importance of integrated systems and processes in converting AI-led capabilities into sustainable value creation. The academic contribution of this study is not merely theoretical; we also provide practical considerations for organizations aiming to promote HRM practices by adopting AI-based systems that fit the sustainability domain. In conclusion, the research emphasizes the transformative power of AI in driving HRM practices that can bring about sustainable growth in the context of a more volatile business landscape.

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