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RESEARCH ARTICLE OPEN ACCESS

IMPACT OF DIGITAL HR PRACTICES ON ENVIRONMENTAL SUSTAINABILITY IN HEALTHCARE INSTITUTIONS OF ANDHRA PRADESH

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ABSTRACT

Electronic Human Resource Management (e-HRM) has applied increasingly as a strategic tool to improve HR effectiveness and sustainability of healthcare organizations. Despite this, there is little empirical evidence on utilization and potential sustainability value in the Andhra Pradesh hospitals. The present study aims at reviewing the prevalence, reporting and perceived impact, practices of e-HRM on sustainability of organization operating of in health care sector of Andhra Pradesh. This was descriptive research with quantitative approach. Participants HR practitioners, administration, and health workers in private hospital settings situated in urban and semi-urban areas. A sample size of 250 was determined based on stratified random sampling method and a structured questionnaire was used to collect data. Instrument reliability and validity were obtained through Cronbach alpha and content validity, respectively. Analytic tools such as correlation, t-test ANOVA, Factor Analysis and SmartPLS were used to analyze collected data. We conclude that adoption of e- HRM practice in hospital level is moderate and in HR and administration functions higher than clinical support functions. Respondents believe that e-HRM as a practice makes the organization more efficient and sustainable. The study highlights the need for e-HRM in the healthcare sector to be employed as a strategic HR performance tool and sustainability enabler. Perhaps, there is a call to increase the level of awareness, training, and infrastructural support in so far as they could and can support the optimal benefits of e-HRM implementation.

I.INTRODUCTION

The convergence of the Sustainable Development Goals (SDGs) and digital technologies has opened up new innovation frontiers in all sectors and areas including healthcare. The focal point of change lies in the Human Resource Management (HRM) which integrates the workforce strategies with the broader eco-friendliness work plan of the company or institution. The era of digital HRM has brought the advent of cutting-edge technologies such as artificial intelligence (AI), cloud computing, mobile applications, data analytics, and HR automation [1], changing how the work in HR is done, and making it efficient, transparent, and sustainable. Digital HRM is not just a nice-to-have technological leap but a strategic need, the most in the service-intensive, resource-strapped healthcare sector. Hospitals in emerging countries, India in particular, need to meet the challenge of delivering quality healthcare, reducing human

resource costs and adhering to broader environmental objectives. In this respect, Andhra Pradesh represents an interesting stage for the study of digital HRM adoption.

The growing focus on digital infrastructure and healthcare reforms by the state government has led to hospitals beginning to digitally manage processes such as payroll, hiring, training, and performance appraisal [2]. Not only do these efforts save administrative costs, they also support a green culture by reducing resource consumption, lessening employee travel and promoting paperless operations. In the context of HR, digital HRM becomes an enabler, a driver for integrating sustainability throughout the HR value chain. E-recruitment, online induction, remote learning software, electronic performance management systems, and employee self-service interfaces solutions that are eco-friendly substitutes to the paper-heavy traditional processes [3].

The benefits of digital HR infrastructure seem to be empirically proven: Families Camp (2021) found that organizations using digital HR infrastructure save 70% on paper, cut admin burdens by 50% and as such are able to work more sustainable and efficiently. In addition to this, digital HR platforms enable data-driven decisions and empower managers to predict staffing needs, allocate resources efficiently and eliminate waste. In addition, the inclusion of indicators of sustainability in HR performance measures results in enhancing the accountability of organizations. For instance, in hospitals they are increasingly used to report employee engagement in green initiatives, the carbon impact of HR function or paper use. These are the approaches to bridge HR initiatives with the organizational sustainability objectives and regulatory requirements [4].

In India, environmentalists / sustainable are now starting to align with HR processes as compliance norms has become HR and environment now equally responsible. NABH releases Climate Action & Sustainability Guidebook; announces new standard on Environment Sustainability & Climate Resilience under its 6th Edition Hospital Accreditation Standards (2025) New Delhi: The National Accreditation Board for Hospitals & Healthcare Providers (NABH) released Climate Action & Sustainability Guidebook here today and announced a new standard on Environment Ramsuities & Climate Resilience under its 6th Edition Hospital Accreditation Standards to be launched by 2025.

This makes sustainability as one of the most vibrant drivers of HR, processes such as to train employees regarding waste reduction, energy and supply sustainability, electronic record, responsible procurement of supplies [5] also integrating information in electronic format can help doing away with papers and errors at the same time [6]. The Ministry of Health & Family Welfare has also released guidelines for Green and Climate-Resilient Healthcare Facilities, highlighting the role of the HR in the procurement processes, infrastructure planning, and the capacity building through learning management system [7]. Evidence on behalf of quality and accreditation organizations similarly underscores sustainable sourcing and workforce development as two key levers of organizational change, both facilitated by HR policies and digital HRM systems [8].

I.1 NATIONAL LANDSCAPE

India's Ayushman Bharat Digital Mission (ABDM) builds the national infrastructure ABHA IDs, HPR (Healthcare Professional Registry), HFR (Health Facility Registry), and UHI that hospitals and HR units depend upon for credentialing, deployment, and interoperable records. ABHA accounts and linked records are burgeoning in quantity according to peer-reviewed and policy sources, suggesting the environment is ripe for HR digitization (e-onboarding, privileging, skills mapping) [9], [10]. At a national level, impacts of AI-enabled administrative automation long understood as anything from digitised paperwork to scheduling highlight HR's role as workers' champion in managing change, relieving staff workload, and preventing burnout and turnover itself, significant drivers of effects social sustainability the direct attribution of HR to social sustainability priorities [11] Urban hospitals in Metro cities such as Visakhapatnam, Vijayawada, and Tirupati in Andhra Pradesh have embraced cloud-based HR software, digital learning platforms, and employee well-being tools, whereas the rural and semi-urban hospitals still grapple with challenges such as insufficient infrastructure, digital illiteracy and change management. This dichotomy reveals the multitemporal nature of digital transformation in HR, and also lays a fertile terrain to analyse its meaning in the account of sustainability in healthcare institutions.

I.2 REGIONAL LANDSCAPE

The health sector scenario in Andhra Pradesh throws light on feasible directions on how digital HRM can play a part on sustainability. Government-driven programmes such as doorstep diagnostics service, and development of electronic image and health record (EHR) are creating mother-lode datasets that HR departments could use for skills-mix planning, for targeted e-learning for rural health workers, and also for delivering a fair HR service [12]. Telemedicine initiatives with hub-and-spoke models also illustrate how digital orchestration overcomes time lag and redundancies in patient transfer, by complementing doctor shift staff planning and competence map planning [13].

An area of concern is the uneven implementation of Digital HRM in India and Andhra Pradesh in particular despite widespread adoption of digital health technologies. While there is evidence that it is cost-effective, enhances the workforce, and promotes green values, there is little empirical work on the role that digital HRM has in the development of sustainable healthcare environments. Articles that are available however most focus on efficiency and economy and other broad dimensions of sustainability emphasizing environmental responsibility, social well-being and long-term organizational sustainability–receive less consideration.

For Andhra Pradesh, where Health System reform is rolling at high speed, maintaining HR records mostly still manual or semi-digital, this gap is even more pronounced. Therefore, the purpose of this research is to investigate the impact of digital HRM practices on the creation of sustainable environment in the hospitals of Andhra Pradesh. By intersecting digital HRM appropriation with organisational performance and sustainability output, this study aims at generating evidence-based well-founded information that is relevant for policy developers, health worker facility managers and HR managers who are thinking about enacting digital transformation and sustainable development goals.

II. LITERATURE REVIEW

The reviewed literature is the theoretical and empirical foundation and application of DHRM. Defined as the performance of traditional HR tasks recruitment, training, payroll and performance assessment utilizing technology, Digital HRM (DHRM) has increasingly been affected by frontier technologies, including AI, machine learning, and big data [14], [15]. Its ability to relieve administrative burden, enhance efficiency and improve employee experience is supported by evidence [16]. In healthcare systems, digital HRM (e-HRM) is not only automation but it also focuses on sustainability through well-balanced workforce establishment, centralized information system, and paperless workflow [17], [18]. Evidence supports its benefits in monitoring performance in real time, e-learning and HR service delivery [19], [20].

The related literature on Green HRM (GHRM) also underscores the integration of environmental issues in HR practice through green recruitment, training, appraisal and incentives. Incorporated research indicates that GHRM is positively associated with the continuation of organizational sustainability performance, innovation and pro-environmental employee behaviours. Types of practice like paperless documentation, energy-efficient office system, and electronic files help in providing eco-ethical healthcare [21], [4]. Research also demonstrates the role of Digital HRM towards sustainability development. Internet recruitment, e-onboarding, and learning management software save on paper, travel and emissions and HR analytics optimizes resource utilization [22], [23], [24]. All of these are associated with cost savings and environmental goals

A parallel line of work highlights organisational readiness and technology acceptance as determinants of successful adoption of the digital HRM. Elaborated model like Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) describe the adoption behaviours, where performance expectancy, facilitating conditions, and digital literacy are found as the robust predictors in healthcare settings [25], [26], [27]. E-HRM refers to the strategic approach by which HR processes are converted from manual systems to electronic systems aimed at with the carriage of delivering value propositions such as efficiency, cost savings, and role positioning of HR as a strategic partner [28]. One typical application is the use of digital tools to assess employees with respect to multidimensional criteria, enabling managers to make solid decisions on performance [29].

Work performance of Employee (EP) in term of quality, productivity, commitment, and innovation are the core of organization') They are achieved if that employees have motivation, skill enhancement and conducive environment at work [30]. Despite these contributions, gaps remain. Current literature considers digital HRM and sustainable HRM distinct from each other, with few empirical investigations combining both especially in healthcare sector of developing countries such as India [31]. Furthermore, a majority of findings are taken from IT and manufacturing, and so, healthcare-specific and regional studies are underdeveloped. The case from Andhra Pradesh, where health informatics adoption is growing, is especially under reported. Therefore, the present study fills this gap by employing the digital HR practices to provide sustainability outcomes of Andhra Pradesh hospitals.

Table 1: Summary of Literature Review on Digital Human Resource Management, Green HRM, and Sustainability in Healthcare.

Theme	Key Findings from Literature	Identified Gaps
Digital HRM: Concepts & Applications	Defined as the use of technology (Artificial Intelligence, Machine Learning, big data, cloud) for traditional HR functions such as recruitment, training, payroll, and appraisal [14], [1]. Enhances efficiency, reduces admin burdens, and improves employee experience [18].	Most studies conceptual or business-sector focused; limited healthcare-specific evidence.
Digital HRM in Healthcare (e-HRM)	Enables data-driven workforce planning, equitable staff deployment, and paperless processes [17], [18]. Improves real-time monitoring, e-learning, and HR service delivery [3], [20].	Few empirical studies on healthcare facilities in emerging economies like India; urban-rural digital divide underexplored.
Green HRM (GHRM) & Sustainability	Green HRM practices (green hiring, training, appraisal, rewards) linked to sustainability performance, innovation, and pro-environmental behaviour [26], [14], [6]. Practices include paperless processes, eco-friendly offices, and electronic health records [16], [12].	Limited integration of digital and green HRM perspectives in healthcare; most focus on manufacturing/IT industries.
Digital HRM as a Sustainability Driver	Web-based recruitment, e-onboarding, and LMS reduce paper, travel, and emissions [10]. HR analytics improves resource efficiency and supports green HR [12], [16].	Lack of comprehensive models linking digital HRM adoption with sustainability outcomes in healthcare.
Organizational Readiness & Technology Acceptance	Adoption influenced by TAM [25] and UTAUT [26] (Venkatesh et al., 2003). Factors such as performance expectancy, facilitating conditions, and digital literacy predict success [9].	Adoption challenges in healthcare (low digital literacy, resistance to change) are underexplored in regional contexts like Andhra Pradesh.
E-HRM, e-Performance Appraisal, and Employee Performance	E-HRM integrates technology into HR functions, improving efficiency and decision-making while positioning HR as a strategic partner [28]. E-performance appraisal systems provide real-time, multidimensional evaluation of employees [29]. Employee performance, measured by productivity, commitment, and innovation, is central to organizational success and sustainability [30].	Few studies link e-HRM and e-performance appraisal directly to sustainability outcomes, particularly in healthcare systems of emerging economies.
Limitations of Existing Literature	Existing studies often examine digital HRM or sustainable HRM in isolation [31]. Healthcare-specific dynamics and regional contexts are underexplored.	Very limited studies on Andhra Pradesh healthcare organizations and their adoption of digital HRM for sustainability outcomes.

Source: Authors, (2026).

II.1 NEED FOR THE STUDY

Sustainable healthcare is more than simply an environmentally friendly push to reduce waste and be more energy efficient it's about developing a resilient and ethically managed workforce which can enable responsible and ethical decision-making and support long-term organisational health. According to the World Health Organization (2022), sustainable healthcare is that which ensures future generations' capacity to meet their own needs without being at the expense of the present, making efficient workforce management very important. The demand for digitally transforming the way we do business, manage remote workforces and deliver healthcare is demonstrated by the recent COVID-19 crisis [16].

"Both private and public healthcare organizations in India work under resource limitation and digital HRM tools provide practical options." Remote recruitment diminishes transport, video- based training saves paper and cloud-based data management limits infrastructural requirements [31]. By strategically deployed, digital HRM enhances employee engagement, organizational responsiveness, and the triple bottom line of sustainability, people, planet, and profit.

Although digital HRM has been explored primarily in terms of the impact on organizational and employee performance [24], its potential for environmental sustainability in healthcare in developing countries has not been investigated. The majority of the research is concentrated in manufacturing or IT sectors; whereas, the gap in the healthcare related studies exits. This research gap is answered by examining the ways digital HRM nurtures sustainable work environments in multi-specialty hospitals of Andhra Pradesh that would enrich academic literature and promote policy-based actions.

II.2 CONCEPTUAL FRAMEWORK

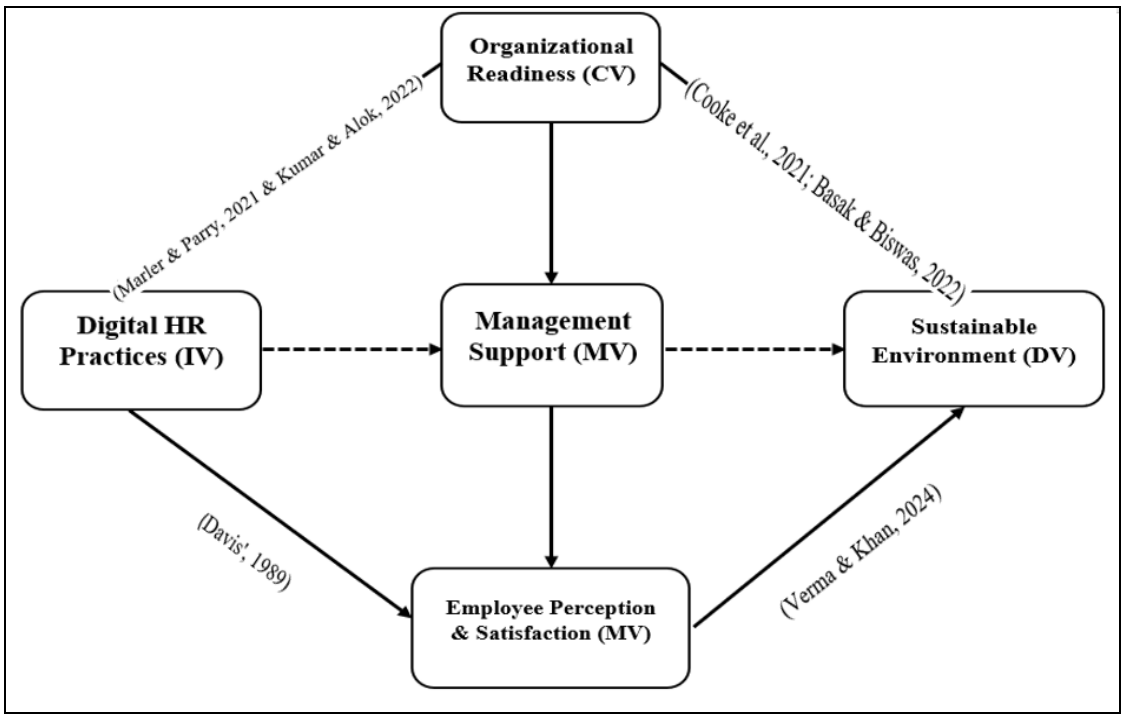

Figure 1: Conceptual Framework of Digital HRM and Sustainability.
Source: Authors, (2026).

III. RESEARCH METHODOLOGY

This research focuses on the proposed objectives by following the research design such as quantitative and descriptive, to investigate the e-HRM adoption, performance and perceived impact to sustainability in the healthcare of Andhra Pradesh. The sampling frame is staff in human resources department, administrative department and hospital health workers working in patients' services from private hospitals in urban and semi-urban, as the universe of interest is all staff i.e., operational; administrative and staff working in HR department. We selected an adequate sample of 250 respondents by applying for a stratified random sampling to secure diversity with respects to roles and hospital types based on the Krejcie and Morgan [32] table. The information was gathered from the closed-ended structured questionnaire and Likert scale items, which were pretested for clarity and appropriateness. The reliability was checked by Cronbach's alpha, while experts' review and factor analysis were used to ascertain the validity. The collected data was analysed by using descriptive statistics (frequency, percentage, mean and standard deviation) and inferential statistics (Correlation, Regression, t-test, and ANOVA), with software's SPSS. The research adhered to rigorous ethical standards for work with human participants, including concepts of volunteerism, informed consent, and confidentiality, as well as with standards of research on humans.

III.1 RESEARCH OBJECTIVES AND HYPOTHESES OF THE STUDY

Table 2: Summary of Research Objectives, Hypotheses, and Focus Areas.

S.No	Research Objective / Hypothesis	Focus Area
Objective	Assess the impact of digital HRM practices on healthcare sustainability.	Digital HRM & Sustainability
H_{01}	Digital HRM practices positively influence sustainability in healthcare.	
Objective	Evaluate adoption and effectiveness of digital HR tools in hospitals.	Digital HR Tools Adoption
H_{02}	Employee perception mediates the effect of digital HRM practices on sustainability outcomes.	
Objective	Analyse employee perceptions of digital HR practices on sustainability and efficiency.	Employee Perception & Efficiency
H_{03}	Organizational readiness positively affects the adoption of digital HRM practices.	
Objective	Examine organizational readiness and technological support for digital HRM implementation.	Organizational Readiness & Technology
H_{04}	Management support positively moderates the relationship between digital HRM practices and employee perception.	

Source: Authors, (2026).

IV. RESULTS & DISCUSSIONS

Table 3: Demographic Profile of the Sample.

Variable	Classification	Frequency	Percent
Gender	Male	141	56.40
	Female	109	43.60
Age (Years)	21 - 30 Years	106	42.40
	31 – 40 Years	118	47.20
	41 – 50 Years	26	10.40
Designation	HR Managers	42	16.80
	Clinical Staff	123	49.20
	Administrative Staff	85	34.00
Experience	Less than 05 Years	115	46.00
	05-10 Years	108	43.20
	More than 10 Years	27	10.80

Source: Authors, (2026).

From table 3 reveal that the size of the sample is 250 and there is small dominance of male (56.40 %) over female (43.60%). Ages distribution provides a relatively young manpower, with about half of it (47.20%) being 31 – 40 years old, but followed by 42.40% are in the range of 21 – 30 years' group. Only 10.40% are between 41 and 50 years of age showing gross under presentation of senior age categories. As far as designation is concerned, clinical staff predominates majority (49.20%), administrative staff 34% and HR staff as 16.80%, such a good representation is found from the systems and operational staff. In terms of job tenure, 46% of the populace has less than 5 years of experience, 43.20% have 5–10 years, and 10.80% have over 10 years of experience with the organization, which indicates a moderately seasoned workforce. In general, the sample under study represents a mixed but predominately young and moderately experienced group, with major clustering role between clinical and administrative activities and a slight predominance of men. This demographic makeup indicates that constructs related to digital HRM, employee engagement, and organisational performance may be influenced to a greater extent by younger/early-middle-career employees, as opposed to very senior employees.

Table 4: Descriptive Statistics.

Constructs	N	Mean	Std. Dev	Kurtosis	Skewness
Digital HR Tools	250	4.32	0.844	5.300	-1.940
Effect of HR Functions	250	4.17	0.860	3.920	-1.622
Digital HR tools are updated and improved	250	4.09	0.878	3.523	-1.606
Satisfied with the digital HR tools	250	4.20	0.896	4.078	-1.825
Improved Work life balance	250	4.26	0.806	6.235	-1.990
Training and support for using digital HR tools	250	3.99	0.865	-0.475	-0.499
Barrier to Technical Competency	250	3.97	0.840	-0.877	-0.227
Prior Digital innovation experience	250	3.92	0.857	-0.704	-0.273
Systematically assess digital transformation	250	4.09	0.894	2.942	-1.517
Resource Allocation for long-term sustainability	250	3.95	0.983	1.360	-1.231
Strategies can be strengthened management	250	3.88	0.898	2.692	-1.384
Management approaches reduce resistance	250	4.02	0.908	2.938	-1.530
Sustainable environment	250	3.82	0.980	0.071	-0.460
To promote sustainability	250	4.34	0.867	4.742	-1.903
Sustainability initiatives	250	3.68	1.096	-0.561	-0.467

Source: Authors, (2026).

We find from the descriptive statistics of table 4 that respondents have positive perception towards digital HRM practices. Promoting sustainability (M = 4.34), digital HR tools (M = 4.32), enhanced work-life balance (M = 4.26), and satisfaction with digital HR tools (M = 4.20) depicting the larger mean values reflecting better acceptance and positive consequences of digital interventions in HR processes. These implications point out that digital HR does not merely automate transaction, but advances employee welfare and organizational agility. Likewise, HR functions (M = 4.17), and systematic evaluation of digital transformation (M = 4.09) also indicate that technology integration significantly contributes to increased efficiency and adaptability in healthcare organizations.

In contrast, factors such as sustainability initiatives (M = 3.68) and sustainable environment (M = 3.82) are relatively lower as is indicative that the adaptation of digital practices in HR does not directly translate into sustainability outcomes. Moderate means are also reported toward training and support for the use of digital HR tools (M = 3.99), and technological literacy barriers (M = 3.97), suggesting that, while employees understand the value that digital tools present, upskilling and capacity development are still significant obstacles to overcome. The response skewness towards agreement (negatively skewed) and high kurtosis are observed for a considerable fraction of the variables which can be taken as indicative of the very strong reply consensus in the views expressed with regard to the benefits of digital HRM.

In summary, the findings confirm the importance of digital HRM in improving employee engagement, work-life balance and organisational performance in the healthcare industry. However, long-term sustainability can only be accomplished with concentrated studies on sustained sustainability programmes, and an ongoing development of the quality of technical skills. As shown in the table 5, the correlation matrix shows that there are strong and highly significant positive relationships among the study variables i.e., Digital HR Practices (DHRP), Employee Performance and Satisfaction (EPS), Motivation and Sustainability (MS), Organizational Responsiveness (OR) and Sustainable Engagement (SE). Among the parameters (e.g., DHRP1–DHRP3, EPS1–EPS3) of each measurement, high inter-item correlations (0.63–0.83) were observed, also suggesting that the measures are internally consistent and reliable.

Some significant relationships are common across constructs. For example, DHRP has a very strong relationship with EPS (0.802), showing that good digital HR practices lead to improved employee performance and satisfaction. Additionally, the strong associations observed between DHRP and MS up to 0.648 reaffirm HR practices influence on the job motivation. Especially the link between EPS and MS is robust (0.770), supporting the notion that both, performance and satisfaction lead to strong employee motivation and, thus, sustainableness. Additionally, OR correlates most with SE (ranging to 0.809), suggesting that the organization being responsive would help sustain employee engagement.

A number of moderate (SE2 = 0.379**), although highly significant relationships can be observed among most of the indicators, indicating a difference in strength of individual indicator association. Second, all correlations are significant at the 1 % level, thereby confirming the appropriateness of these results. the result indicates that digital HR practices impact on employee performance, motivation, organizational responsiveness and sustainable engagement; therefore, it highlights their crucial role in reinforcing organizational effectiveness and sustainability.

Table 5: Correlation Matrix.

Variables	DHRP1	DHRP2	DHRP3	EPS1	EPS2	EPS3	MS1	MS2	MS3	OR1	OR2	OR3	SE1	SE2	SE3
DHRP1	1	.836**	.754**	.703**	.730**	.509**	.542**	.612**	.616**	.627**	.559**	.735**	.585**	.591**	.415**
DHRP2	.836**	1	.758**	.802**	.807**	.567**	.583**	.633**	.729**	.638**	.596**	.756**	.604**	.637**	.570**
DHRP3	.754**	.758**	1	.703**	.638**	.475**	.633**	.648**	.647**	.554**	.567**	.670**	.599**	.552**	.417**
EPS1	.703**	.802**	.703**	1	.784**	.571**	.716**	.656**	.770**	.509**	.604**	.725**	.619**	.565**	.526**
EPS2	.730**	.807**	.638**	.784**	1	.572**	.606**	.624**	.607**	.623**	.536**	.710**	.636**	.678**	.497**
EPS3	.509**	.567**	.475**	.571**	.572**	1	.696**	.632**	.546**	.583**	.705**	.466**	.653**	.379**	.308**
MS1	.542**	.583**	.633**	.716**	.606**	.696**	1	.695**	.738**	.385**	.584**	.601**	.550**	.425**	.421**
MS2	.612**	.633**	.648**	.656**	.624**	.632**	.695**	1	.661**	.472**	.617**	.699**	.644**	.516**	.504**
MS3	.616**	.729**	.647**	.770**	.607**	.546**	.738**	.661**	1	.420**	.563**	.747**	.539**	.445**	.539**
OR1	.627**	.638**	.554**	.509**	.623**	.583**	.385**	.472**	.420**	1	.725**	.587**	.752**	.480**	.343**
OR2	.559**	.596**	.567**	.604**	.536**	.705**	.584**	.617**	.563**	.725**	1	.629**	.809**	.430**	.455**
OR3	.735**	.756**	.670**	.725**	.710**	.466**	.601**	.699**	.747**	.587**	.629**	1	.669**	.612**	.454**
SE1	.585**	.604**	.599**	.619**	.636**	.653**	.550**	.644**	.539**	.752**	.809**	.669**	1	.583**	.451**
SE2	.591**	.637**	.552**	.565**	.678**	.379**	.425**	.516**	.445**	.480**	.430**	.612**	.583**	1	.513**
SE3	.415**	.570**	.417**	.526**	.497**	.308**	.421**	.504**	.539**	.343**	.455**	.454**	.451**	.513**	1
Sample Size	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Authors, (2026).

Table 6: Regression Analysis.

Model Summary										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.855[a]	.731	.727	.41674	.731	166.677	4	245	.000	2.402
a. Predictors: (Constant), SE, ORG, MS, EP										
b. Dependent Variable: DHRP										

Source: Authors, (2026).

Table 6 is to analyzes the relationships between Sustainable Engagement (SE), Organizational Responsiveness (ORG), Motivation (MS), and Employee Performance (EP) vis-à-vis Digital Human Resource Practices (DHRP), the regression was run. A strong correlation is shown by the model on the average with R =. 855, which suggests a strong relationship between the predictors and dependent variable. The R Square value of. 731 indicates that 73.1% of the variance in DHRP can be explained by the predictors, which is a very considerable model. The Adjusted R Square (. 727) also verifies the stability and generality of the models.

The F-test value of 166.677, with the probability level of p = 0. 000 (p < 0.01) indicate that the model is significant and that the predictors altogether explain the variance of DHRP. The value of the Durbin-Watson (DW) statistic is 2.402 (it should fall between 1.5 and 2.5) and thus we do not have any problem of autocorrelation with this model. From the findings, it is clear that Sustainable Engagement, Organizational Responsiveness, Motivation, and Employee Performance are all strong and significant determinants of Digital Human Resource Practices. This ascertains the pivotal importance of these precursors in framing successful digital HR strategies, particularly for organizational sustainability and employee performance focus.

Table 7: ANOVA.

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	115.789	4	28.947	166.677	.000[b]
	Residual	42.550	245	.174		
	Total	158.340	249			
a. Dependent Variable: DHRP						
b. Predictors: (Constant), SE, ORG, MS, EP						

Source: Authors, (2026).

ANOVA table 7 examines the overall significance of multiple regression model to the effect of Sustainable Engagement (SE), Organizational Responsiveness (ORG), Motivation (MS) and Employee Performance (EP) on Digital Human Resource Practices (DHRP). From the result, it is evident that the value of sum of squares of regression (115.789) is much higher than that of residual sum of squares (42.550), suggest that there is a significant variance of DHRP can be explained by the predictor variables. The established F-ratio of 166.677 is recorded, with possible level of significance at p =. 000 (p <0.01) indicating that the model was statistically significant. This indicates that taken together SE, ORG, MS and EP make substantial contributions to DHRP and the model was satisfactory and fits the data very nicely. The Framework shows that OR has strong effect on DHRP, and this DHRP exert a positive on SE as well as EPS. SE also strengthens EPS, supporting its mediating role. Indeed, all paths are high and positive, except MS that is low and negative with respect of DHRP. Specifically, this model accounted for 58% variance for DHRP, 61.8% for SE, and 75.1% for EPS, which means the high predictive power in general.

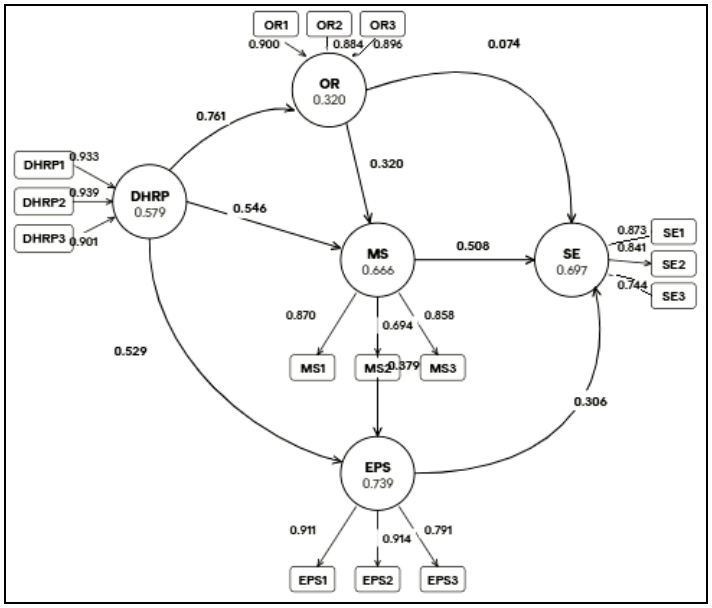

Figure 2: Architecture and Workflow of ESM.
Source: Authors, (2026).

Table 8: Construct reliability and validity.

Constructs	Cronbach's alpha	Composite reliability (rho a)	Composite reliability (rho c)	Average variance extracted (AVE)
DHRP	0.915	0.920	0.947	0.855
EPS	0.844	0.862	0.906	0.763
MS	0.846	0.848	0.907	0.765
OR	0.874	0.876	0.922	0.798
SE	0.762	0.776	0.862	0.677

Source: Authors, (2026).

Table 8 shows that the alphas for all constructs are all higher than the cut-off value of 0.70, ranging from 0.762 to 0.915, suggesting that the instruments presented strong internal consistency. Composite reliabilities (rho_a and rho_c) are also within an acceptable range (all >0.77), indicating the reliable measurement of the constructs. The Average Variance Extracted (AVE) values of the constructs were also greater than the minimum criteria value of 0.50 (Nunnally and Bernstein, 1994), with values ranging from 0.677 to 0.855, thus reflecting a sufficient convergent validity. Of them, DHRP exhibits good reliability and validity ($\alpha = 0.915$; AVE = 0.855), SE has the lowest reliability and validity, with values that are supported to be acceptable ($\alpha = 0.762$; AVE = 0.677). The findings as a whole clearly establish that all constructs employed in the study are reliable and valid, so that the measurement model tested is statistically acceptable and fit for further structural equation modelling.

Table 9: Discriminant validity (Fornell - Larcker Criterion).

Variables	**DHRP**	**EPS**	**MS**	**OR**	**SE**
DHRP	**0.925**				
EPS	0.828	**0.874**			
MS	0.788	0.795	**0.874**		
OR	0.762	0.831	0.733	**0.894**	
SE	0.734	0.766	0.791	0.695	**0.823**

Source: Authors, (2026).

The discriminant validity outcomes demonstrate that all constructs (DHRP, EPS, MS, OR, and SE) are statistically different, as the square root of AVE under the diagonal is greater than the inter-construct correlations. This suggests little overlap and high construct clarity between the variables. The model also exhibits strong discriminant validity underpinning its confident interpretation in further structural analysis.

Table 10 present the Collinearity Statistics (Variance Inflation Factor VIF) of the study variables. VIF is employed to diagnose multicollinearity in independent variables in a regression context. if the VIF value is >10, there are issues of severe multicolinearity, if it is between 5-10 multicolinearity is likely, but it may be OK, and if the value is <5, then the model has acceptable level of multicollinearity.

Table 10: Collinearity statistics (VIF).

Sno	**Variable**	**VIF**
01	DHRP1	3.748
02	DHRP2	3.799
03	DHRP3	2.649
04	EPS1	2.752
05	EPS2	2.758
06	EPS3	1.579
07	MS1	2.244
08	MS2	2.432
09	MS3	1.759
10	OR1	2.637
11	OR2	2.132
12	OR3	2.421
13	SE1	1.591
14	SE2	1.720
15	SE3	1.425
16	MS x DHRP	1.000

Source: Authors, (2026).

From the table above, all the datasets have values between 1.000 – 3.799 which is quite below the acceptable limit. The highest VIF is DHRP2 (3.799) and DHRP1 (3.748), which is close in value to 5, for which moderate but acceptable collinearity would be suggested. The VIF is smallest for the interaction term MS × DHRP (1.000), there was no multicollinearity.

Other variables, for instance SE3 (1.425), EPS3 (1.579) and SE1 (1.591) also have very low VIF values, indicating that the problem of collinearity here is very insignificant. Taken, all together, we can conclude that predictors in the model do not present multicollinearity and, consequently, the variables can be kept in the bivariate/multivariate regression-models without redundancy. The VIF values suggest that there is not much multicollinearity in this study and the regression model is reliable.

Table 11: Model fit.

	Saturated model	Estimated model
SRMR	0.086	0.132
d_ULS	0.896	2.086
d_G	0.774	1.045
Chi-square	1037.197	1144.350
NFI	0.719	0.690

Source: Authors, (2026).

The model fit statistics indicate that the proposed model is an adequate, though not excellent, fit to the data. Although we can observe that the SRMR and NFI present some margin for achieving a good fit, results still remain acceptable which indicates that the proposed model is trustworthy for analysis and interpretation.

Table 12: Path Coefficients.

Variables	Mean	SD	t-statistics	p-values	Hypothesis
DHRP -> SE(H_1)	0.308	0.065	4.845	0.000	H_{01} Validated
DHRP -> EPS(H_2)	0.394	0.092	4.275	0.000	H_{02} Validated
EPS -> SE(H_2)	0.507	0.055	9.207	0.000	
OR -> DHRP(H_3)	0.761	0.042	18.300	0.000	H_{03} Validated
MS -> EPS(H_4)	0.421	0.068	6.180	0.000	H_{04} Validated
MS x DHRP -> EPS(H_4)	-0.068	0.019	3.653	0.000	

Source: Authors, (2026).

Table 13: List of Hypotheses and Nature of Hypothesized Relationships.

Hypothesis	Statement	Hypothesized Relationships
H_{01}	Digital HRM practices positively influence sustainability in healthcare.	Positive
H_{02}	Employee perception mediates the effect of digital HRM practices on sustainability outcomes.	Mediation
H_{03}	Organizational readiness positively affects the adoption of digital HRM practices.	Positive
H_{04}	Management support positively moderates the relationship between digital HRM practices and employee perception.	Positive Moderation

Source: Authors, (2026).

Results of the path coefficient analysis confirms that all (H1–H4) are statistically validated with significant t-statistics and p-values of 0.000. It is evidenced that digital HR practices (DHRP) exert a positive and significant effect on both sustainable engagement ($\beta = 0.308$, $t = 4.845$) and employee performance and sustainability ($\beta = 0.394$, $t = 4.275$). Employee performance (EPS) also exerts a significantly positive impact on sustainable engagement ($\beta = 0.507$, $t = 9.207$), which has the most significant effect.

Organizational readiness (OR) surfaces as another significant predictor, having a very strong effect on adoption of digital HR practices ($\beta = 0.761$, $t = 18.300$). Furthermore, the support of manager (MS) has a significant positive effect on EP and S ($\beta = 0.421$, $t = 6.180$). Interestingly, there is a small significant negative effect of the interaction term (MS × DHRP; $\beta = -0.068$, $t = 3.653$), which means that even though both managerial support and digital HR practices are positive in their contribution, when combined their overall effect on employee performance decreases a little

All research hypotheses (H01, H02, H03 and H04) are accepted and find that digital HR practices, organisational readiness, managerial support and employee performance significantly contribute in improving the sustainable engagement and performance outcomes. The results also validate that digital HR practices, employee performance, organizational readiness, and managerial support are conducive to sustainable engagement and performance outcomes, and careful matching of the level between managerial support and HR digitalization is needed for optimal performance.

IV.1 IMPLICATIONS OF THE STUDY

This study also emphasises that DHRPs are more than mere technologies but indeed strategic enablers for such sustainable, resilient and people-centred healthcare organisations.

If used correctly, digital HR programs increase operational efficiency, reduce administrative burdens and offer improved employee engagement, motivation, and performance, and ultimately enable long-term organizational sustainability. The findings clearly underscore that employee performance, work motivation, sustainable engagement, and organizational responsiveness are important predictors of successful digital HR implementation. Managers must provide tangible support resources, training, and policy congruence while maintaining congruence with organizational goals, all in the context of strategic implementation. Over-reliance on emblematic or ambivalent leadership support can undermine the value of digital HR projects revealing the necessity of synchronising technology acquisition and leadership mobilisation.

Finally, the constructs that are supported DHRP, employee performance, work motivation & satisfaction, organizational resources, and self-efficacy are very relevant to the HR manager, and provide useful instruments for using HR for interventions, monitoring of results and using data to make HR decisions. Policymakers and organisational leaders are called to create supportive policies and workforce development programmes for digital HR transformation that turn digitised HR practices into the drivers of sustainable engagement, higher performance and organisational resilience.

V. CONCLUSION OF THE STUDY

Research supports that Digital HR Practices (DHRP) are enablers of change for improving employee engagement, motivation, and organizational agility and business performance in healthcare sector. The results verify that sustainable commitment and organisational success share a significant and positive relationship with DHRP and indicate DHRP as a strategic enabler rather than technology's artefact. When implemented successfully, digital HR projects enable administration processes to become more dynamic, increase workforce effectiveness, and contribute to the creation of strong and sustainable healthcare organisations.

The findings also indicate that strategic deployment and organizational capabilities are critical intermediaries for translating digital HR practices into both employee performance and sustainability performance. Although managerial support positively enhances performance in isolation, the sign of moderation in the negative direction is indicative of the tendency for the managerial support and digital HR practices are to be overly-focused or mis-aligned to some extent which has a slight negative impact on the relationship. This highlights the value of an integrated approach and strategic focus in unlocking value from digital HR.

Second, the study's holistic approach reveals how healthcare providers can reach sustainability and business excellence over the long term through a combination of digital HR practices with engaged, motivated and proactive employees' involvement, especially in under-resourced settings. The confirmed DHRP constructs EMP performance, motivation and satisfaction, OR, and self-efficacy ensure trusty instruments for managers, policy makers, and HR practitioners to develop HR systems that are suitable for adaptive manpower, and sustainable growth of the organization.

VI. AUTHOR'S CONTRIBUTION

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