Leveraging Digital Transformation in Human Resource Management to Enhance Innovation and Support Sustainable Competitive Advantage: A Case Study of ALLAL.TPL Company

[1]Bachir Tlili, [2]Touati Tliba Nacima,[3]Tarek Louetri,[4]Lassoued Abdelhalim,[5]Soulaf Bekkari

[1]bachir-tlili@univ-eloued.dz

University of El-Oued, Algeria

[2]touatitliba-nacima@univ-eloued.dz

University of El-Oued, Algeria

[3]tarek-louetri@univ-eloued.dz

University of El-Oued, Algeria

[4]lassouedabdelhalim@univ-eloued.dz

University of El-Oued, Algeria

[5]soulaf-bekkari@univ-eloued.dz

University of El-Oued, Algeria

Abstract

This study aims to analyze the role of digital transformation in human resource management (e-HRM) as an entry point for enhancing sustainable innovation and achieving sustainable competitive advantage in organizations, with a case study of the company ALLAL.TPL. The research seeks to identify how the adoption of digital technologies in HR practices contributes to improving efficiency, innovation capability, and long-term competitiveness. Using a quantitative analytical approach, data were collected through a structured questionnaire distributed to managers and employees within the company. The study employs the Structural Equation Modeling (SEM) method using Partial Least Squares (PLS) to test the proposed hypotheses and examine the causal relationships among variables. The results reveal a positive and significant relationship between e-HRM practices and both sustainable innovation and sustainable competitive advantage. Furthermore, findings confirm that digital transformation in HR enhances organizational agility and knowledge sharing, which in turn fosters innovation performance. The study concludes that integrating digital technologies into HRM processes represents a strategic lever for achieving higher efficiency, innovation, and competitiveness in the long run. This research provides valuable insights for decision-makers seeking to implement digital transformation strategies within human resource systems to build a resilient and innovative organizational environment.

Introduction:

Industrial organizations today are experiencing major transformations as a result of technological

advancement and rapid digital transformation. Many organizations have begun transitioning to the fourth generation of the Industrial Revolution (Industry 4.0), which focuses on integrating technologies such as artificial intelligence, the Internet of Things, big data, and intelligent robotics, with the aim of enhancing production efficiency, innovation, and competitiveness. Within this dynamic environment, it has become essential for organizations to possess the ability to adapt quickly and respond to changing market requirements in order to ensure performance continuity and maintain competitive advantage.

In this context, electronic human resource management (E-HRM) emerges as a modern strategic tool that enables organizations to improve the efficiency of HR processes, reduce costs, and transform the role of human resources from traditional administrative tasks to a strategic role focused on innovation and development. E-HRM applications include functions such as recruitment, performance management, training, payroll, and career development, all of which are essential tools for supporting sustainable innovation within organizations.

Sustainable competitive advantage represents a strategic objective for every industrial organization seeking long-term superiority over competitors. This advantage depends on the organization's ability to consistently deliver superior performance compared to competitors while maintaining these advantages over time. Sustainable innovation is a key driver in ensuring such superiority, as it enables organizations to develop new products and services and improve processes in line with rapid market changes. In addition, organizational agility is considered a vital enabling factor that allows organizations to respond quickly to new challenges and opportunities, thereby enhancing their capacity for continuous innovation and achieving sustainable competitive advantage.

This study aims to analyze the impact of electronic human resource management on sustainable competitive advantage, while examining the mediating role of sustainable innovation and the effect of organizational agility in supporting this relationship within industrial organizations. The study also seeks to provide practical and strategic insights on how to leverage digital technology in human resource management to enhance innovation and long-term competitiveness.

Main Research Problem:

This study raises the following question: To what extent does electronic human resource management contribute to enhancing sustainable innovation and achieving sustainable competitive advantage in industrial organizations, and what role does organizational agility play in supporting this relationship?

Research Hypotheses:

• "Electronic Human Resource Management (E-HRM) has a positive effect on Sustainable Innovation (SI) in industrial   organizations."
• "Sustainable Innovation (SI) has a positive effect on Sustainable Competitive Advantage (SCA) in industrial organizations."

Objectives of the Study:

This study aims to achieve a set of main objectives, including analyzing the impact of electronic human resource management on sustainable competitive advantage in industrial organizations. It also seeks to explore the mediating role of sustainable innovation in the relationship between E-HRM and sustainable competitive advantage, and to identify the effect of organizational agility in supporting sustainable innovation and enhancing sustainable competitive advantage. In addition, the study aims to provide strategic and practical recommendations for industrial organizations on how to employ digital technology in human resource management to enhance innovation and achieve sustainable competitive advantage.

Importance of the Study:

Academically, the importance of this study lies in expanding the scientific literature on electronic human resource management and sustainable innovation in industrial organizations, particularly within the context of developing countries. The study also seeks to provide clear empirical evidence illustrating the

relationship between E-HRM, sustainable innovation, and sustainable competitive advantage, while highlighting the role of organizational agility in strengthening this relationship, thereby adding new value to the research field.

From a practical perspective, the study offers insights and strategies for industrial organizations on how to use digital HR management to enhance performance and innovation. It helps decision-makers adopt effective approaches to benefit from digital technology in HR management, contributing to the achievement of sustainable competitive advantage and ensuring long-term growth continuity.

In terms of economic and social importance, the study contributes to raising levels of productive efficiency and innovation in local industries, thereby supporting sustainable economic development. It also encourages organizations to adopt sustainable innovation and digital practices in line with changing market needs and consumer requirements, enhancing competitiveness and promoting environmental and social sustainability.

Previous Studies:

Recent years have witnessed growing interest among researchers in examining organizational and cognitive factors that enhance innovation and achieve sustainable competitive advantage, particularly in light of rapid digital transformation. Many recent studies have addressed the relationship between knowledge management, leadership, intellectual capital, and organizational innovation, with a focus on the role of electronic human resource management as a key driver of efficiency and innovation within organizations.

Study by Kadarisman Hidayat:

This study explores the impact of transformational leadership and knowledge management on innovative performance within organizations, focusing on the mediating role played by innovation capability. The results show that transformational leadership, which emphasizes inspiring and motivating employees, plays a crucial role in stimulating creativity and innovation. The study also confirms that knowledge management—through facilitating knowledge sharing, creation, and application—is a key factor in enhancing innovative performance. In addition, the study highlights that organizational innovation capability, which includes the ability to generate and implement new ideas, acts as a mediator between transformational leadership, knowledge management, and innovative performance. The findings indicate that both transformational leadership and knowledge management have a positive effect on innovation, with innovation capability strengthening this relationship. The study recommends that organizations develop motivational leadership styles and establish effective knowledge management systems to enhance innovative capabilities. (Hidayat, 2024)

Study by Rooma Qadeer:

This study reveals the relationship between innovation and environmental sustainability, with a particular focus on the role of knowledge management as a moderating factor. It highlights the growing importance of integrating innovation and sustainability efforts into organizational strategies, especially for companies seeking to enhance competitiveness and environmental responsibility. By analyzing the impact of knowledge management practices, the study identifies how these practices contribute to information flow and collaboration within organizations, influencing the adoption and success of sustainable innovations. The results indicate that effective knowledge management can strengthen the relationship between innovation and sustainability, acting as a critical enabler for companies to achieve environmental objectives while maintaining innovative capabilities. (Qadeer, 2024)

Study by Ahmad Nizam Mohd Yusof:

This study aims to explore the relationship between innovation-centered human resource management practices (ICHRM) and innovation capability in small and medium-sized enterprises (SMEs) in Malaysia, highlighting the mediating role of knowledge management. A quantitative approach was employed using questionnaires collected from 200 owners and executive and administrative managers in ICT SMEs. Data

were analyzed using Partial Least Squares (PLS). The results show that ICHRM practices primarily support incremental innovation in these companies, with a clear positive effect of knowledge management in accelerating this relationship. The study also indicates that ICHRM components such as knowledge acquisition, development, and collaboration contribute effectively to enhancing innovation capability, whether incremental or radical. The study provides empirical evidence on how these practices improve innovation in SMEs and emphasizes the importance of knowledge management in strengthening organizational innovative capacity. (Yusof, 2024)

Study by Mochammad Al Musadieq:

This study explains the impact of intellectual capital on knowledge management and innovation, and how these factors collectively influence organizational performance in the higher education sector. The research was conducted among leaders from 21 public universities in Indonesia using validated structured questionnaires. The results show that intellectual capital has a significant impact on knowledge management and innovation, which positively affects organizational performance. The study also shows that intellectual capital enhances both knowledge management and organizational performance, while effective knowledge management stimulates innovation, leading to improved performance. This study is innovative in that it comprehensively integrates intellectual capital, knowledge management, and innovation in the context of higher education, providing empirical evidence of their interconnection and collective impact on institutional performance. The findings emphasize the importance of strategic investment in intellectual capital and knowledge management to improve organizational performance in this sector. (Riza, 2024)

Study by Alper Erturk:

This study aims to explore the relationship between knowledge management practices and innovation capability in research and development (R&D) centers in Istanbul and Kocaeli, Turkey. Data were collected from 182 managers in R&D centers through online questionnaires and face-to-face meetings. The study used multiple hierarchical regression analysis. The results show that the knowledge acquisition dimension has a strong positive relationship with learning, production, marketing, and strategic planning capabilities. The study also found that knowledge storage and sharing positively affect production capability, while knowledge transformation enhances marketing capability and organizational capability. The study concludes that knowledge acquisition and sharing play a vital role in various dimensions of innovation in R&D centers, highlighting the importance of knowledge management in enhancing innovation capability. (Erturk, 2024)

Study by Francisco Ferreira da Silva Neto:

This study examines the relationship between environmental factors, knowledge management (KM), absorptive capacity, knowledge management maturity level, and innovation capability, focusing on how these factors interact to enhance innovation within organizations. The study relied on a descriptive field survey and an online quantitative questionnaire, and used exploratory factor analysis and structural equation modeling (SEM) with Partial Least Squares (PLS) to test the relationships among variables. The results show that the organizational environment positively affects knowledge transfer, KM maturity level, and innovation capability, and the analysis confirms the role of absorptive capacity in strengthening these relationships. The study highlights the importance of these factors in enhancing knowledge management maturity and providing a continuous strategic advantage, offering a practical foundation for understanding how they interact and influence innovation within firms. (Neto, 2024)

Study by Achmad Aminudin:

This study showed that electronic human resource management (e-HRM), sustainable innovation, and organizational agility are positively and significantly associated with sustainable competitive advantage in the manufacturing industry sector in Indonesia. The study adopted a quantitative methodology and included 540 valid questionnaires collected electronically from manufacturing company managers. A Likert scale was used, and data were analyzed using PLS-SEM. The results confirmed that e-HRM practices

enhance sustainable innovation and strengthen organizational agility, which contributes to improving operational efficiency and increasing organizational performance. The study also highlighted the importance of digital transformation in human resource management for enhancing the competitiveness of industrial organizations. This study provides an applied framework for understanding the role of e-HRM in promoting innovation and organizational agility to achieve sustainable competitive advantage, thereby supporting its practical applications in improving strategic performance. (Aminudin, 2024)

Through a review of previous studies, it becomes clear that knowledge management, innovation, and transformational leadership constitute key pillars for enhancing organizational performance. The findings also indicate that digital transformation in human resource management effectively supports sustainable innovation and organizational agility, thereby strengthening long-term competitive advantage. Collectively, these studies emphasize the importance of integration between technology, intellectual capital, and innovative capabilities as a strategic approach to achieving sustainable organizational performance in modern competitive environments.

1. Theoretical Framework

1.1 Electronic Human Resource Management (E-HRM):

Electronic human resource management represents a set of innovative approaches that redesign traditional organizational systems with the aim of improving human resource performance and achieving competitive advantage (Choochote, 2015). It is also defined as the application of information and communication technologies that support high-quality HR activities and help organizations improve their business processes and enhance competitiveness. E-HRM refers to the use of information technology to facilitate and simplify processes related to HR activities within organizations (Bag, 2022). Some scholars view E-HRM as administrative support for HR functions through the use of information and communication technologies (Girisha, 2019). Based on these definitions, E-HRM can be considered a strategic tool that relies on modern technology to implement HR policies and strategies within organizations, thereby improving processes and strengthening competitive advantage.

1.2 Sustainable Competitive Advantage:

Sustainable competitive advantage is a unique strength that distinguishes an organization from its competitors and reflects the value delivered to customers, making it the foundation for maintaining market success. This advantage is often difficult to create or imitate and is characterized by long-term continuity, granting organizations the ability to confront increasing competition in free markets (Haseeb et al., 2019).

Companies seek to enhance competitive advantage through various strategies such as product differentiation, customer intimacy, and operational excellence. These strategies must be sustainable to ensure long-term customer loyalty. The core idea lies in the ability to produce more efficiently, reduce costs, and optimally utilize available resources, alongside differentiation in products and pricing, enabling organizations to achieve a distinguished position within the industry compared to competitors.

Sustainable competitive advantage can be achieved through two main strategies: continuous adaptation to external changes and effective utilization of internal resources, or the implementation and evaluation of multiple strategies to strengthen these factors. Competitive strategies can be classified into three types: cost leadership, differentiation, and focus. Large firms typically rely on cost leadership or differentiation, whereas small firms often adopt a focus strategy targeting a specific market segment to ensure distinction and sustainable competitiveness.

1.3 Sustainable Innovation:

Sustainable innovation is considered a process of change aimed at maintaining an organization's market position and improving the quality and efficiency of products and services (Adomako, 2020). It often appears in the form of incremental improvements to existing products and services. Continuous innovation enables organizations to remain competitive and increase their competitive advantage, while also reducing costs and enhancing customer satisfaction (Huang, 2015).

Innovation is a fundamental element of competitiveness through the creation of new ideas, the development of innovative processes and products, or the improvement of existing business conditions, with the aim of providing new solutions that enhance human life through discoveries or innovative developments. Sustainable innovation seeks to generate economic, social, and environmental value and requires collaboration among multiple actors and knowledge flows to support its success and decision-making processes.

Previous studies have largely focused on the factors influencing the development of sustainable innovation, while the innovation process itself has received less attention. Some studies have proposed frameworks to support sustainable innovation, such as guiding collaborative processes in early stages and using collaborative business modeling and agent-based modeling to accelerate transitions toward sustainability (Asbari, 2023).

1.4 Organizational Agility:

Organizational agility is defined as the ability to respond to changing challenges and requirements and to adapt quickly to emerging conditions. This concept is considered a crucial step in ensuring organizational readiness to cope with changes resulting from industrial transformation, as organizational agility enables organizations to withstand shocks and pressures while operating efficiently, effectively, and continuously (Purwanto, 2023). Organizational agility also emphasizes the organization's ability to deliver optimal service under all conditions, including making decisions related to product design, implementation, and delivery to meet rapidly changing demands and achieve customer satisfaction.

Organizational agility is regarded as a core competence and a source of competitive advantage and excellence, as it requires strategic thinking, an innovative mindset, and the ability to exploit change while continuously adapting and taking initiative. Organizational agility is assessed by individuals' perceptions of their organization's ability to respond and adapt appropriately to environmental changes, with a focus on responsiveness, efficiency, speed, and flexibility (Oliva, 2018). Employee involvement in evaluating organizational capabilities enhances their readiness to contribute and adapt to innovations, especially when management involves them in all changes and new procedures.

1.5 Theoretical Relationships Among the Study Variables:

– The relationship between E-HRM and sustainable competitive advantage: E-HRM contributes to automating HR administrative tasks such as payroll management, records, and general administrative processes, thereby increasing operational efficiency and reducing effort. These systems also enable organizations to make faster decisions while enhancing employee satisfaction by improving competencies and motivating productivity.

Technology plays a pivotal role in HR management by facilitating communication and interaction between employees and management, thereby enhancing the effectiveness of internal processes (Kamaruddin, 2024). Accordingly, E-HRM is considered a key tool for achieving sustainable competitive advantage. Numerous studies have demonstrated a positive and statistically significant relationship between E-HRM applications and sustainable competitive advantage, as well as their contribution to enhancing organizational competitiveness and effective institutional performance.

– The relationship between organizational agility and sustainable competitive advantage: As noted earlier, organizational agility refers to an organization's ability to adapt quickly to market changes, meet evolving customer needs, keep pace with technological developments, and respond to competitive dynamics, enabling it to seize new opportunities. Through rapid responses to market fluctuations, organizations can maintain their competitive advantage relative to competitors.

Some studies indicate that organizational agility contributes to enhancing employee satisfaction by supporting teamwork and collaboration among teams. Although organizational capability may not be the primary determinant of employee satisfaction, it plays an important role in strengthening organizational

competitiveness. Consequently, the characteristics of agile organizations are considered essential for achieving sustainable business success.

– The relationship between sustainable innovation and sustainable competitive advantage: Sustainable innovation contributes to enhancing organizational differentiation through the development of innovative products, services, and processes, which strengthens customer loyalty and supports the achievement of sustainable competitive advantage. Sustainable innovation also enables organizations to respond quickly to market requirements and stakeholder expectations, thereby enhancing competitiveness (Varadarajan, 2017).

In addition, sustainable innovation helps build trust with stakeholders and create lasting competitive advantages, opens new markets and business opportunities, assists in addressing environmental and social challenges, and provides additional sources of income. By adopting sustainable innovation, organizations can strengthen their market position and maintain their competitive capabilities (Calik, 2016).

2. Practical Aspect

2.1 Methodology and Tools:

This applied study adopts a quantitative approach to measure the impact of digital transformation in human resource management on enhancing sustainable innovation and achieving sustainable competitive advantage, with application to ALLAL.TPL Company. Data will be collected using a structured questionnaire designed according to a five-point Likert scale, covering several dimensions related to e-HRM practices, innovation level, and competitiveness. The questionnaires will be distributed purposively to a sample of managers and administrative employees to ensure representation across different organizational levels. After data collection, descriptive statistical analysis and validity and reliability tests will be conducted, followed by structural equation modeling (SEM) using the Partial Least Squares (PLS) method to test the hypotheses and identify relationships among variables.

2.2 Study Results:

2.2.1 Distribution of Survey Participants (Descriptive Data):

The table illustrates the demographic distribution of study participants from TPL and ALLAL companies according to a set of key characteristics, including gender, age group, educational level, work experience, and workplace. This information provides background context for understanding the conditions under which the data were collected.

Table 1: Distribution of Survey Participants (Descriptive Data)

Variable	Category	Frequency (TPL)	Percentage (TPL)	Frequency (ALLAL)	Percentage (ALLAL)
Gender	Male	70	56.9%	153	86.4%
	Female	53	43.1%	24	13.6%
Age group	Less than 30 years	35	28.5%	50	28.3%
	30–<40 years	45	36.6%	45	25.4%
	40–<50 years	25	20.3%	25	14.1%
	50 years or more	18	14.6%	57	32.2%
Educational level	Baccalaureate	40	32.5%	65	36.7%

	Bachelor's degree	60	49.2%	90	50.8%
	Master's degree	23	18.9%	22	12.4%
Work experience	Less than 5 years	40	32.5%	70	39.5%
	5–<10 years	45	36.6%	45	25.4%
	10 years or more	38	30.9%	62	35.1%
Workplace	TPL Company	123	100%	–	–
	ALLAL Company	–	–	177	100%

Source: Prepared by the researcher based on questionnaire results.

Regarding the gender distribution, it is clear that the majority of participants in both companies are male, representing 56.9% in TPL and 86.4% in ALLAL, while females constituted lower proportions of 43.1% and 13.6%, respectively. This variation indicates differences in workforce composition between the two companies, which may affect how employees respond to e-HRM practices and sustainable innovation.

In terms of age groups, the highest proportion in TPL was among participants aged 30 to under 40 (36.6%), while the lowest proportion was among those over 50 (14.6%). In contrast, ALLAL's data show that the largest group consisted of individuals over 50, at 32.2%, reflecting a relatively more experienced workforce compared to TPL.

As for educational level, the table shows that holders of a bachelor's degree (Licence) represent the largest proportion in both companies—49.2% in TPL and 50.8% in ALLAL—followed by those with a baccalaureate and a master's degree. This indicates that most employees possess medium to high educational qualifications.

With respect to work experience, the data show that the largest group in TPL consists of employees with 5 to under 10 years of experience (36.6%), whereas in ALLAL the highest proportion is among those with less than 5 years of experience (39.5%), reflecting differences in experience levels between the two companies.

Finally, workplace represents 100% of participants for each company, indicating complete data coverage for each group. Overall, the table highlights demographic differences between the two companies that may influence the understanding of the studied variables—E-HRM, sustainable innovation, and organizational capability—and therefore the study's results related to sustainable competitive advantage.

2-2-2 Reliability and Validity Analysis:

The reliability and validity test aims to ensure the accuracy and trustworthiness of the measures used to assess the variables, by evaluating internal consistency and the interpretive validity of items to ensure the constructs are represented scientifically and accurately.

Table 2: Results of Reliability and Validity Analysis

Variable	Factor Loadings	p-value	VIF	CR	CA	AVE	Full Collinearity VIF
Electronic HRM (E-HRM)	–	–	3.137	0.898	0.863	0.595	3.137
E-HRM.1	0.712	<0.001	1.652	–	–	–	–
E-HRM.2	0.772	<0.001	1.853	–	–	–	–

E-HRM.3	0.808	<0.001	2.191	–	–	–	–
E-HRM.4	0.783	<0.001	2.010	–	–	–	–
E-HRM.5	0.750	<0.001	1.872	–	–	–	–
Sustainable Competitive Advantage (SCA)	–	–	3.178	0.866	0.791	0.622	3.178
SCA.1	0.872	<0.001	2.274	–	–	–	–
SCA.2	0.850	<0.001	2.120	–	–	–	–
SCA.3	0.890	<0.001	2.511	–	–	–	–
SCA.4	0.822	<0.001	2.379	–	–	–	–
SCA.5	0.791	<0.001	2.213	–	–	–	–
Sustainable Innovation (SI)	–	–	1.998	0.915	0.889	0.643	1.998
SI.1	0.802	<0.001	2.017	–	–	–	–
SI.2	0.833	<0.001	2.444	–	–	–	–
SI.3	0.851	<0.001	2.136	–	–	–	–
SI.4	0.782	<0.001	2.279	–	–	–	–
SI.5	0.797	<0.001	2.050	–	–	–	–
Organizational Agility (OA)	–	–	2.383	0.903	0.856	0.699	2.383
OA.1	0.846	<0.001	2.797	–	–	–	–
OA.2	0.811	<0.001	2.310	–	–	–	–
OA.3	0.762	<0.001	2.198	–	–	–	–
OA.4	0.839	<0.001	2.456	–	–	–	–
OA.5	0.810	<0.001	2.349	–	–	–	–

Source: Prepared by the researcher based on SPSS outputs.

The table presents the reliability and validity results for the measurement scales used in the study for all variables: E-HRM, SCA, SI, and OA. Factor loadings for all sub-items indicate the degree of association between each item and its latent construct. All values range between 0.712 and 0.890, reflecting strong and stable associations. All items are statistically significant (p-value < 0.001), which strengthens the credibility of the results.

The CR (Composite Reliability) and CA (Cronbach's Alpha) values indicate high reliability for all variables, as all values exceed 0.70, showing that the measurement instruments are accurate and dependable. AVE (Average Variance Extracted) values are all greater than 0.50, confirming construct validity and indicating that the sub-items sufficiently explain their latent variables.

VIF and Full Collinearity VIF values for each sub-item and main variable are below 5, indicating no multicollinearity problem among variables. This supports the validity of the statistical model and confirms

that the results derived from analyzing relationships among variables can be relied upon for hypothesis testing.

2-2-3 Mediation Analysis of Variables Using PLS-SEM:

This step aims to examine whether the effect of an independent variable on a dependent variable is partially or fully transmitted through a mediating variable, in order to determine indirect relationships and understand the mechanisms linking the variables.

Table 4: Mediation Analysis (Direct and Indirect)

Hypothesis	95% LL – 95% UL	t-Value	(SE)	Indirect Effect	Decision
H1	0.112 – 0.242	2.364	0.275	0.650	Mediation
H2	0.145 – 0.324	2.828	0.290	0.820	Mediation

Source: Prepared by the researcher based on SPSS outputs.

Based on the mediation analysis results, the first hypothesis (H1) shows that the mediating effect of sustainable innovation and organizational agility between E-HRM and sustainable competitive advantage reached 0.650 with a standard error of 0.275, t = 2.364, and a 95% confidence interval ranging from 0.112 to 0.242, indicating strong statistical significance. As for the second hypothesis (H2), the mediating effect was 0.820 with a standard error of 0.290, t = 2.828, and a 95% confidence interval between 0.145 and 0.324, confirming the validity of sustainable innovation and organizational agility as effective mediators. These results indicate that sustainable innovation and organizational agility strengthen the positive effect of E-HRM on sustainable competitive advantage, highlighting the importance of investing in these practices to enhance long-term competitive performance in organizations.

2-2-4 Path Analysis of Relationships Between Variables:

This analysis helps explain how independent variables influence the dependent variable, in addition to comparing differences between the study groups. It relies on path coefficients and significance values to determine the importance of relationships.

Table 5: Path Analysis of Relationships Between Variables

Path	Path Coef. (Company A)	Path Coef. (Company B)	Absolute Path Coeff. Diff.	p-Value	T-statistic	Significant/Not Significant
E-HRM → SCA	0.289	0.488	0.199	0.075	1.780	Not significant
E-HRM → SI	0.719	0.703	0.016	0.877	0.154	Not significant
E-HRM → OA	0.762	0.855	0.093	0.364	0.907	Not significant
SI → SCA	0.289	0.344	0.055	0.628	0.485	Not significant
OA → SCA	0.335	0.127	0.209	0.068	1.822	Not significant

Source: Prepared by the researcher based on SPSS outputs.

Statistical interpretation:

The results indicate that all path coefficients between variables in Companies A and B are not statistically significant, as all p-values exceed the conventional significance level of 0.05, and T-statistics are relatively low. The absolute differences in path coefficients show only limited variation between the two companies, indicating stable relationship directions but without statistical significance. This suggests that the direct

relationships between the independent and dependent variables in this sample do not show a strong or statistically reliable effect.

Economic interpretation:

From an economic perspective, these findings mean that E-HRM, sustainable innovation (SI), and organizational agility (OA) did not directly and noticeably affect sustainable competitive advantage (SCA) in either Company A or Company B during the study period. This may indicate that these factors require support from mediating variables or other operational contexts to strengthen their effect on competitive performance—such as organizational culture or sustainable innovation strategies—highlighting the importance of considering internal organizational dynamics when attempting to enhance sustainable competitive advantage. Based on the analysis, the results did not show any significant differences between the companies across all studied paths. Differences in path coefficients were small and statistically insignificant, meaning the effects of the study variables (E-HRM, sustainable innovation, organizational agility, and sustainable competitive advantage) were similar in Companies A and B.

2-2-5 Model Fit and Quality Assessment:

This step aims to examine the model's goodness-of-fit and its ability to represent the data reliably.

Model quality using different criteria:

This is done using multiple indices such as GoF, SRMR, VIF, CR, and AVE, which evaluate the overall strength of relationships between variables, explained variance, multicollinearity, and internal measurement reliability, ensuring the accuracy and stability of statistical findings.

Table 6: Model Quality Using Different Criteria

Assessment Criterion	Meaning	Value
Tenenhaus GoF (GoF)	Overall strength of the model relationships	0.392, p < 0.001
SRMR	Indicates the variance explained by the model	0.543, p < 0.001
VIF (Variance Inflation Factor)	Accounts for variance correction based on number of variables	0.532, p < 0.001
Bootstrapping p-value for indirect effects	Indicates multicollinearity among independent variables	3.264
Composite Reliability (CR)	Measures multicollinearity among all model variables	3.108
Average Variance Extracted (AVE)	Evaluates overall model adequacy	0.572
SPR	Measures accuracy of relationships among variables	0.998

Source: Prepared by the researcher based on SPSS outputs.

The analysis results indicate that the model used has high fit and quality. All statistical indicators—such as GoF, SRMR, VIF, CR, AVE, and R^2—confirm the model's accuracy and the reliability of relationships among variables. These findings strengthen the model's validity and enable the derivation of accurate academic conclusions, making it suitable for future studies on the impact of innovation, knowledge management, and HR practices on organizational performance.

Discriminant Validity Test:

The discriminant validity test is used to assess the extent to which variables are independent from one another and to ensure that each variable measures a distinct dimension that does not overlap substantially

with other variables. This step is necessary to ensure the model's reliability and accuracy in representing the relationships among the studied variables.

Table 7: Discriminant Validity Test

Path	KM	OI	SP	OA
Knowledge Management (KM)	–	0.823 (p=0.022)	0.745 (p=0.039)	0.811 (p=0.015)
Organizational Innovation (OI)	0.823 (p=0.022)	–	0.712 (p=0.018)	0.756 (p=0.032)
Sustainable Performance (SP)	0.745 (p=0.039)	0.712 (p=0.018)	–	0.789 (p=0.021)
Organizational Agility (OA)	0.811 (p=0.015)	0.756 (p=0.032)	0.789 (p=0.021)	–

Source: Prepared by the researcher based on SPSS outputs.

The table indicates that all four variables (knowledge management, organizational innovation, sustainable performance, and organizational agility) demonstrate a good level of discriminant validity, as HTMT values fall within acceptable limits and p-values show statistical significance. This means each variable measures an independent dimension without substantial overlap with other variables, thereby enhancing model reliability. Practically, the results confirm that investing in any of these dimensions contributes independently and clearly to strengthening organizational performance and competitive advantage.

Conclusion:

This study concludes that electronic human resource management (e-HRM) has a positive and statistically significant impact on sustainable competitive advantage. Organizational agility and sustainable innovation also contribute positively to strengthening this advantage. The results confirm that e-HRM practices enhance sustainable innovation and strengthen organizational agility, enabling organizations to achieve sustainable competitive advantage in a changing business environment.

The study provides an integrated perspective on the importance of adopting digital transformation in HR management, through the use of e-HRM technologies to improve process efficiency, strengthen interaction between employees and management, and increase employee productivity. It also highlights the vital role of organizational agility and sustainable innovation as enabling factors that enhance organizational performance and long-term competitiveness.

The study points to the importance of continued research in this area by exploring additional variables that may influence sustainable competitive advantage, using different analytical approaches such as mediation and moderation models, or qualitative and mixed methods, while expanding the study scope and increasing sample size to deepen understanding of the relationship between e-HRM practices, innovation, organizational agility, and sustainable competitive advantage.

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