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The role of electronic human resource practices in the sustainable human resource management

El papel de las prácticas electrónicas de recursos humanos en la gestión sostenible de recursos humanos

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ABSTRACT

Through a theoretical framework, this study aimed to identify definitions of sustainable human resource management by covering the definitions proposed by many researchers and attempting to reach a new definition. Many previous studies have identified many benefits that can be achieved by using sustainable human resource management in organizations. In addition, this study summarized these benefits and identified the most frequently mentioned benefits by reviewing previous studies. The study measured the impact of Electronic -Human Resource practices on Sustainable Human Resource Management in the Iraqi Ministry of Higher Education and Scientific Research by serving 180 employees. The partial least squares (PLS) method in the Smart PLS statistical program (version 4.0.8.9) was used as a statistical method for data analysis. The results

of the study showed a relatively acceptable effect of e-human resource practices on sustainable human resource management in the Ministry of Higher Education and Scientific Research. The most important recommendation of this study was that if the Ministry wants to encourage the adoption of new working methods such as sustainable human resource management, it should introduce digital technologies such as artificial intelligence and machine learning in the continuous development and training of employees.

Keywords.E-Human Resource practices, Sustainable Human Resource Management, Human Resources, Ministry of Higher Education, Scientific Research.

RESUMEN

A través de un marco teórico, este estudio tuvo como objetivo identificar definiciones de la gestión sostenible de recursos humanos, abarcando las definiciones propuestas por muchos investigadores y tratando de llegar a una nueva definición. Muchos estudios previos han identificado numerosos beneficios que pueden lograrse mediante el uso de la gestión sostenible de recursos humanos en las organizaciones. Además, este estudio resumió estos beneficios e identificó los beneficios mencionados con mayor frecuencia al revisar estudios anteriores. El estudio midió el impacto de la Gestión Electrónica de Recursos Humanos en la Gestión Sostenible de Recursos Humanos en el Ministerio de Educación Superior e Investigación Científica de Irak al atender a 180 empleados. El método de mínimos cuadrados parciales (PLS) en el programa estadístico Smart PLS (versión 4.0.8.9) se utilizó como método estadístico para el análisis de datos. Los resultados del estudio mostraron un efecto relativamente aceptable de la gestión electrónica de recursos humanos en la gestión sostenible de recursos humanos en el Ministerio de Educación Superior e Investigación Científica. La recomendación más importante de este estudio fue que si el Ministerio quiere fomentar la adopción de nuevos métodos de trabajo como la gestión sostenible de recursos humanos, debe introducir tecnologías digitales como la inteligencia artificial y el aprendizaje automático en el desarrollo y la formación continua de los empleados.

Palabras clave.*Gestión electrónica de recursos humanos, gestión sostenible de recursos humanos, recursos humanos, Ministerio de Educación Superior, Investigación Científica.*

INTRODUCTION

In light of the increasing progress in the use of modern technology and computer applications and communication sciences, and the increase in investment in information systems that led to a huge digital revolution in the functions of business organizations (AlHamad & Al Qawasmi, 2014; Alshurideh et al., 2019; Ahmad et al.,2022; Al Kurdi et al., 2021; AlHamad et al., 2022), as technological progress, technological innovation and the Internet of Things have changed the functions and practices of human resources to digital processes that are transformed into automated and data-based processes (Martínez-Morán, Urgoiti & Diez, 2021). And due to the explosion of knowledge in addition to changes in the internal and external business environment, the use of electronic human resources has become an essential requirement and urgent necessity for human resource management in all services and industrial business sectors (AlHamad et al., 2021; Al-Maroof et al., 2021; Shamout et al., 2022). Over the past decades, human resource management has evolved from traditional human resources to a more technology-dependent profession called electronic human resource practices (Al-Harazneh & Sila, 2021; Qamari & Rakotoarizaka, 2022). As the human element plays an important role in bringing about positive

changes that are reflected in the economies of the whole world, business organizations have come to realize that the key to success depends on the effective management of resources (Alkalha et al., 2012; Alshraideh et al., 2017; Al-Lozi et al., 2018; Alshurideh et al., 2020, Hamouche & Chabani, 2021). Balakrishnan and Duraipandian (2020) emphasized in their study on automating human resource practices using electronic human resource practices in organizations depends on employees' perceptions and their degree of acceptance of E-HRP in the institution. Thus, the science of electronic human resource practices emerged, and electronic human resource practices was not an overnight product, but rather the result of successive developments and great effort in traditional human resource management (HRM) practices that were limited to the routine tasks of human resource management (such as recruitment, incentives, rewards, vacations) to expand these tasks and make them more strategic through the automation of traditional human resource practices (Alshurideh et al., 2021; Asfahani, 2021).

E-HRP is seen as a modern administrative approach that requires high and necessary human capacities and a change in management methods and organizational structures, and the development of electronic infrastructure so that organizations can raise the levels of their services and employee efficiency. It is a concept that has aroused increasing interest in organizations as well as the scientific community. It is defined as the organization's ability to work efficiently and effectively and to achieve a state of continuous growth and development to form an integrated system toward achieving goals (Miles, 1969), and this system affects job satisfaction, employee effectiveness, and performance (Zu'bi et al., 2012; Alshurideh et al., 2016; Alshurideh et al., 2019; Kurdi et al., 2020; Ghazal et al., 2021; Xenidis & Theocharous, 2014). This concept is closely related to employees' perceptions of fairness, justice, and participation within the organization (Bottiani et al., 2014). In addition, it can help promote harmony between organizations, employees, and leaders, which may lead to successful and sustainable human resource management. Sustainable development in society is not possible without emphasizing sustainability in the business world (Schaltegger et al., 2012, Wagner, 2015). As HRM researchers have focused on the difficult need to develop more sustainable human resource management systems (Ramalho & de Fátima, 2022), it is noted that there is an emerging interest in the academic sector for studies focusing on sustainability and sustainable development (Linnenluecke and Griffiths, 2010), and despite the increase in research in recent years (Roca and Searcy, 2012), the discussion of sustainable human resource management began in the late 1990s in Germany, Switzerland and Australia. The research conducted by (Müller-Christ & Remer, 1999, Zaugg et al., 2001, Gollan, 2000, Wilkinson et al., 2001 and Avery & Bergsteiner 2011), was crucial as these authors highlighted the importance of sustainable human resource management based on previous studies on environmental management, human relations and corporate sustainability (Ehnert & Harry, 2012) Currently, research on sustainability applied to human resources is being developed through various disciplines and research fields. These studies focus on corporate sustainability, corporate social responsibility, and sustainable work systems, which suggest a different perspective that respects the traditional concepts and practices of strategic human resource management in the business environment (Macke & Genari, 2019).

The intersection between sustainability and HRM relies on two assumptions: the role of HRM in promoting organizational sustainability (Cohen et al., 2012, Ehnert et al., 2013, Guerci & Pedrini, 2014) and human sustainability in HRM processes (Mariappanadar, 2003, Ehnert, 2009, Cohen et al., 2012). Based on these two assumptions, current research has had different goals and is based on different assumptions about the role of human resources in sustainability (Ehnert & Harry, 2012, Järlström et al., 2016). So far, research and discussions related to sustainability in organizations have focused primarily on the environmental aspects of sustainability. Therefore, sustainability capability has received relatively little attention from HRM researchers (HRM), for example, (Ehnert, 2009; Heikkinen et al., 2021; Pfeffer, 2010). Sustainable HRM seeks to develop sustainable business organizations and establish sustainable HRM systems in those organizations. According

to Stahl et al. (2020), HRM practices can be considered sustainable if they contribute to social well-being, environmental protection, and long-term economic prosperity. In contrast, practices are unsustainable if they have harmful social, environmental, or economic impacts. More recently, there has been increasing research interest in identifying and developing the concept of sustainable HRM (Lopez-Cabrales & Valle-Cabrera, 2020). For example, recent systematic literature reviews on sustainable HRM aim to envision this relatively new field (Anlesinya & Susomrith, 2020; Chams & García-Blandón, 2019; Macke & Genari, 2019). Previous studies have examined the outcomes of E-HRP practices on employees as well as organizational outcomes such as employee job performance (AlHamad et al., 2022; Al-Hawary & Shdefat, 2016), employee job satisfaction and turnover intention (2013 .al Maier et) and employee commitment (Al-Abbadi et al., 2021) and organizational trust of employees and employee productivity (Iqbal et al., 2019; Al-Lozi et al., 2017).

In addition, the outcome of E-HRP practices on institutional results such as business (Ahmed, 2020; Al-Hawary et al., 2020), organizational image (Parry & Tyson, 2011), corporate sustainability (Alkhodary, 2021). Since goals are the starting and ending points of any human activity, they form the basis for the existence and survival of organizations and are part of their design. Organizations cannot function without a deep understanding of their goals, because organizations aim to achieve specific goals and objectives, set by employees and top management (Hitt et al., 2001). Based on the foregoing, organizations need to build and develop human resource information systems capable of meeting the requirements of sustainable human resource management. However, there is a research gap in this area, especially in terms of understanding the impact of E-HRP on sustainable human resource management. This gap in the literature requires more research in this area. Therefore, this study aims to shed light on the concept of E-HRP and the benefits of implementing E-HRP, in addition to the main objective of identifying the impact of E-HRP on sustainable human resource management. By providing the theoretical framework for E-HRP (such as e-recruitment and e-selection, e-training, e-performance evaluation, and e-compensation systems), application areas are used to identify the most important procedures related to E-HRP in an attempt to bridge the gap and adopt these strategies. It is also important to determine the level of interest among research organizations in the field of E-HRP.

The research examines two variables: electronic human resource management practices (independent variable) and sustainable human resource management (dependent variable).The research is divided into several sections:The first section covers the introduction.The second section covers the theoretical framework.The third section presents the data and results.The final section discusses the results, conclusions, and recommendations.The research flows from introducing the topic, reviewing past literature, collecting and analyzing data, and discussing the implications of the results. By structuring the paper in this way, the research logically builds from theory to evidence to analysis.

THEORETICAL FRAMEWORK

Electronic human resource practices

In today's digital economy era, the use of an electronic system for human resource management has become imperative to meet the challenges of human resource management in the 21st century, as Zafar (2010) emphasized. Companies and institutions today embrace the philosophy of E-human resource management and have grown rapidly. Organizations today have implemented e-human resource management (Crestone, 2005), and the rapid increase in Internet users in recent decades has greatly contributed to a major change in business organizations and made big changes in the activities and functions of the organization, especially the human resources function (AlHamad et al., 2022). Human resource management in organizations today has undergone tremendous change as a result of the development of information and communication technologies through the use of the Internet and web technology, which has helped significantly improve human

resource management practices (Strohmeier & Kabst, 2009). Based on the fact that e-human resource management is an approach and means to implement tactics related to human resource management, policies, and systems in the organization through the continuous assistance and comprehensive and effective application of modern knowledge and technology on the Internet (Al-Saidi & Fadhel, 2020), the rapid advancement of Internet facilities around the world over the past decade has facilitated the implementation and use of e-human resource management (Stormier, 2006).

This term gained great importance alongside the concept of e-commerce in the 1990s when organizations began using the Internet and websites for a large number of human resource management functions such as employee payments, employee directories, and employee communications (Gueutal et al., 2005). E-human resource management is an extension of human resource information systems, which deal with traditional and strategic human resource management tasks (Zafar et al., 2010). Researchers have emphasized that the emergence of Internet networks and the development of communications and information technology has led to many changes in the organization, such as reducing the number of hierarchical and administrative levels, authority levels, and decision-making points (Alshurideh et al., 2019; Al Kurdi et al., 2020; Alzoubi et al., 2021).Therefore, the concept of electronic human resource practices emerged as a natural response to this changing era (Mousavidavondi & Fartas, 2012). The e-human resources department has become able to transform human resource management into a practical employee and manager application. Thus, each of them can access these functions through widespread electronic interfaces via institutions' internal networks (AlHamad et al., 2022).Table(1) illustrates the various definitions of the concept of E-HRP based on previous studies:

Table 1. Definitions of E-HRP

Definition	Researchers	N
The practices and competencies that when utilized lead to supporting human resource management.	Aral, (2007)	11
E-HRP is an umbrella term for human resource management and is a comprehensive term covering all mechanisms of integrating human resources and technology, to create and convey value within organizations to employees and stakeholders.	Bondarouk&Ruël, (2009)	22
It is a means of implementing human resource management strategies, policies, and practices in organizations through the deliberate and direct support of web-based channels and their full utilization.	)Fisher,(2010	33
The process of planning, implementing, and applying information technology over electronic networks and supporting no less than two individuals, individually or collectively, to increase performance in carrying out human resource activities.	Fatimah, (2014)	44
A new type of thinking and administrative strategies emerged in a rapidly changing era to adapt to evolving technologies, information, and communications in performing their functions.	Amuna et al., (2017)	55
It is a web-based result that takes advantage of the latest web application technologies to provide a timely solution for human resource management.	Altar et al., (2019)	66
It is a fully integrated, organization-wide electronic network of human resource data, information services, databases, devices, applications, and exchanges that are openly accessible at any time by employees, managers, and human resource specialists.	Nageswari & Natarajan, (2020)	7
It is the use of digital technologies in the form of web-based applications involving computers, software, cloud technologies, chatbots, social media,	Taylor, (2020) &Armstrong	8

smartphones, and a range of processes that help provide services for human resource management.		
It is the full integration of all human resource systems based on shared human resource data and information about interconnected tools and processes.	Mukden, (2020)	9
It is the process of integrating functions between human resource management and information technology aimed at creating value for both employees and managers.	Raman, (2020)	10
It is a good way to implement human resource strategies, policies, and practices in an organization through sustained and directed support by making full use of web-based channels and networks.	Namenda& Geisha, (2020)	11

While early definitions viewed technologies and the importance of E-HRP, later definitions saw it in light of the impact of technology as one of the global challenges facing human resource management, as shown in the study of (Barbara& Cornelia, 2012). From the viewpoint of (Mukden, 2020), E-HRP is the full integration of all human resource systems based on shared human resource data and information about interconnected tools and processes. This definition comes close to the explanation of (Suresh Kumar & Padma Suvarna, 2020), that E-HRP is the system used to acquire, store, process, analyze, retrieve, and distribute information related to the organization's human resources. The definition (Al-Saidi & Fadhel, 2020), that the system and technology supported by the human resource base in organizations is a good way to implement human resource strategies, policies, and practices in an organization through sustained and directed support by making full use of web-based channels and networks (Nurimansjah et al., 2022), concluded by defining E-HRP as the administrative support of human resource functions in organizations through the use of Internet technology.

The dimensions of electronic human resource practices

The dimensions of electronic human resource practices can be illustrated in the following table:

Table 2. Shows the dimensions of E-HRP from the perspective of some authors and researchers

The Dimensions																	Researchers and year	N
human resource management activities	human resource management	Infrastructure	perceived benefit	ease of use	Transformational	Relational	Operational	Communications	electronic records	electronic discipline	electronic selection	Compensationelectronic	performance evaluation	performance management	Education	Electronic training and	Electronic recruitment		
					*	*	*											Lepak & Snll (1998)	1
			*	*														Jagetia et al. (2003)	2
													*					Card & Miller (2005)	3
												*	*			*	*	Hooi (2006)	4
												*	*			*	*	(AlHamad et al. 2022)	5
											*	*	*			*	*	Panayotopoulu et al. (2007)	6
								*					*					Pouyan & Nazari (2009)	7
					*	*	*											Zafar (2009)	8
											*							Parry&Tyson (2011)	9
	*	*																Rawash & Saydam (2012)	10

After reviewing the views of some researchers, the dimensions referred to by (Hooi,2006) and (AlHamad et al. 2022) were chosen, as follows:

E-Recruitment and E-Selection: Organizations use the Internet as one of the external sources of attraction and recruitment. The first use of the Internet for recruitment practice was in the mid-nineties when the public media termed it the "recruitment revolution" because it achieved tremendous success bringing great benefits for both the organization and human resource management (Dhamija, 2012). The term e-recruitment refers to the process where an organization

posts job vacancies on its own websites or other internet recruitment sites, then allows applicants to submit job applications or resumes electronically (using email or any other electronic method) (Galanaki, 2002).

E-Training: The human resource management system diagnoses the skills, abilities, and knowledge possessed by the organization to assist in preparing development and training plans for employees that are commensurate with the needs of the organization with the possibility of redistributing them to jobs according to their skills, knowledge, and abilities and in line with their academic qualifications (Al Hamad, 2016; Ahmad et al., 2020; Al Mehrez et al., 2020). Information technology has greatly supported training practices in recent years, enabling employees to access education and training without the need for physical locations for this purpose. Organizations have also been able to enhance their competitive capability by promoting a culture of continuous online learning and training. Thus, meeting the organization's current and future needs is more flexible (Ramayah, Ahmad & Hong, 2012; AlHamad et al., 2012).

E-Performance Appraisal: The performance appraisal of human resources can be conducted using the Internet, meaning that managers can provide performance evaluation information directly to the HR department via electronic forms. This reduces paper usage for both the supervisor and the supervisee, helping reduce time, cost, and effort spent on human resource management. There are also self-service applications for managers that allow them to input performance evaluation results instantly, in addition to the ability to set employee performance goals, and outcomes, planning, and publishing them on their pages (Piggot-Irvine, 2013). The main purpose of a performance evaluation system is to control employee performance and behavior, to ensure that their behavior is consistent with organizational goals (AlHamad, 2022).

E-Compensation Systems: The e-compensation system includes all employee payroll records in the institution, whether they work under internal or external contracts such as consultants, as well as those working temporarily with the institution on an hourly or any other system it follows (Elshamy et al., 2017; Alomari et al., 2019; Yuliawatiet al., 2021). The system also includes leaves and leave tracking, and supports employee retirement plans, healthcare, and other employee benefits or incentives. E-compensation systems are used for various purposes such as: developing and implementing a payroll system, providing benefits, and evaluating the effectiveness of the compensation system. An institution can develop a compensation system by identifying important job characteristics, determining relative compensatory value using job analysis, and converting job evaluation points into a wage structure by surveying wage rates in the labor market (Candy & Miller, 2003). According to Willis (2001), compensation is one of the important issues for attracting and retaining talent in organizations. Organizations fundamentally assume that money influences employee behavior in shaping attitudes, and thus, wages impact workforce attraction and retention (Parker & Wright, 2001).

Sustainable Human Resource Management

The Brundtland report (World Commission on Environment and Development (WCED) 1987) is considered a pivotal moment for the advancement of sustainability globally (Saeidi et al., 2022). This report introduced sustainability as "development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs". Based on the Brundtland report, sustainability relies on three pillars, which are the economic, social, and environmental realms, which are interconnected and impact each other across multiple dimensions. Accordingly, companies focus on reducing their environmental impact (Nikolaou et al., 2019). In other words, companies have focused more on reducing the environmental, economic, and social problems that can arise from their business functions while improving their innovation, creativity, and green practices such as cleaner production, leading to waste reduction and resource improvement (Tooranloo et al., 2017). Human resources are one of the company's most important resources, known as the workforce (Jabbour & Santos, 2008). However, sustainability and cleaner

production require new attitudes toward human resource management (Saeidi et al., 2022). In this regard, Ehnert (2009) introduced another phenomenon, known as sustainable human resource management. Responding to external and internal challenges such as increasing environmental protection concerns, achieving sustainability goals, sustainable development, global competition, and innovation, necessitates shifting the approach toward human resource management (Stankevičiūtė and Savanevičienė, 2018). The human resource management system helps maintain the knowledge base of the institution through cleaner production innovations and environmentally friendly best practices that leave no carbon footprint to disrupt environmental balance (Mehta and Chugan, 2015), thus providing free business solutions to meet long-term sustainability goals (Jabbour and Santos, 2008). Sustainable human resource management and cleaner production techniques have reduced negative environmental impacts (Wilkinson et al., 2001), and in some cases, even reflected the depletion of natural resources as a whole (Ahmad, 2015). According to Macke and Genari (2019), the balance between environmental, economic, and social sustainability depends largely on human resource management.

In addition to organizations, researchers have recently focused more on conducting studies on sustainability and developing its concepts, for example, sustainability and supply chain (Negri et al., 2021), sustainability and corporate social responsibility (CSR) (Meseguer-Sánchez et al., 2021), sustainability and tourism (Zekan et al., 2022), and financial efficiency (Lan et al., 2019). However, there is a lack of empirical and theoretical studies on sustainability in human resource management (Piwowar-Sulej, 2021, Piwowar-Sulej, 2021; Stofkova and Sukalova, 2020). Sustainable human resource management can be defined according to its evolutionary temporal context and the conceptual developments in their contexts as a long-term, socially responsible oriented approach and economically appropriate selection and development (Zing& Thom, 2004). Enter (2009) saw sustainable human resource management as an economic rationality for companies to invest in preserving their resources if the work of these companies is at risk. (Ehnert et al., 2016) defined it as the adoption of human resource management strategies and practices that enable the achievement of financial, social, and environmental goals, with impact inside and outside the organization and over a long period of time while controlling unintended side effects and negative reactions.While (Armani, 2017) defined sustainable human resource management as a process in which work manages its components and activities in a way that benefits workers, and ensures that the application of this business model contributes positively to the organization. While (Ranging, 2019 & Kaibab). Indicated that sustainable human resource management is the ability of organizations to create value in their institutions and thus have the ability to renew value and renew wealth by applying and developing human resource policies and practices. In addition, caring for the human side leads to encouraging sustainable performance in human resources and thus seeks to improve human resource management (Chasm & Blandon, 2019: 110).

The Dimensions of Sustainable Human Resource Management

The Brundtland Commission report links sustainability to three dimensions (the economic, social, and environmental dimensions). Previous research on sustainable human resource management has often looked at two or three dimensions. While (Maternal, 2019: 195) saw that the dimensions of sustainable human resource management are:

The Economic Dimension: This is the dimension that focuses on achieving sustainability of the economic structure through capital efficiency and use of resources, securing the basic needs and requirements of the individual, and improving their standard of living by maximizing the returns that must be achieved from products and services (Maternal, 2019) The economic dimension consists of capital efficiency, fulfilling basic needs, and economic justice (Gonium, 2008).

The Social Dimension: This is the dimension that focuses on achieving social justice and justice in the distribution of natural and economic resources, promoting social interaction and participation in local communities, developing cultural diversity, caring for human rights, and

strengthening social relations (Maternal, 2019). The social dimension consists of equality in distribution, social mobility, employee participation, cultural diversity, and organizational sustainability (Gonium, 2008).

The Environmental Dimension: Comprehensive organizational activities and procedures that are likely to reduce negative environmental impacts. This dimension focuses on protecting ecosystems, conserving energy sources, and accessing renewable resources (Maternal, 2019). The environmental dimension consists of ecological systems, energy, biodiversity, bioproductivity, and adaptability (Gonium, 2008).

The Relationship between electronic human resource practices in the sustainable human resource management

The number of companies adopting the philosophy of electronic human resource management and starting to implement it within the organization is growing rapidly (Cedar, 2005). Thus, implementing human resource sustainability policies helps create more productive and motivated human resources, which ultimately leads to organizational success (Enter, 2009). The rapid advancement of internet facilities worldwide over the past decade has facilitated the implementation and use of electronic human resource management (Stormier, 2006). On the other hand, public awareness regarding environmental, social and economic issues that may arise from a bigger business scenario has led organizations to demonstrate their commitment to human resource sustainability (Hebert et al., 2016). The dimensions of electronic human resource management were represented by operational electronic human resource management which cared about the administrative function such as payrolls, employee personal data and record keeping (Rewash & Swoop, 2012). While the dimensions of human resource sustainability consisted of the economic dimension based on the principle of maximizing individual income to the utmost extent and eliminating poverty by optimally exploiting natural resources (Nawaz, 2006). The second dimension of electronic human resource management was relational electronic human resource management which cared about supporting business processes through training, recruitment and performance management (Rewash & Swoop, 2012).

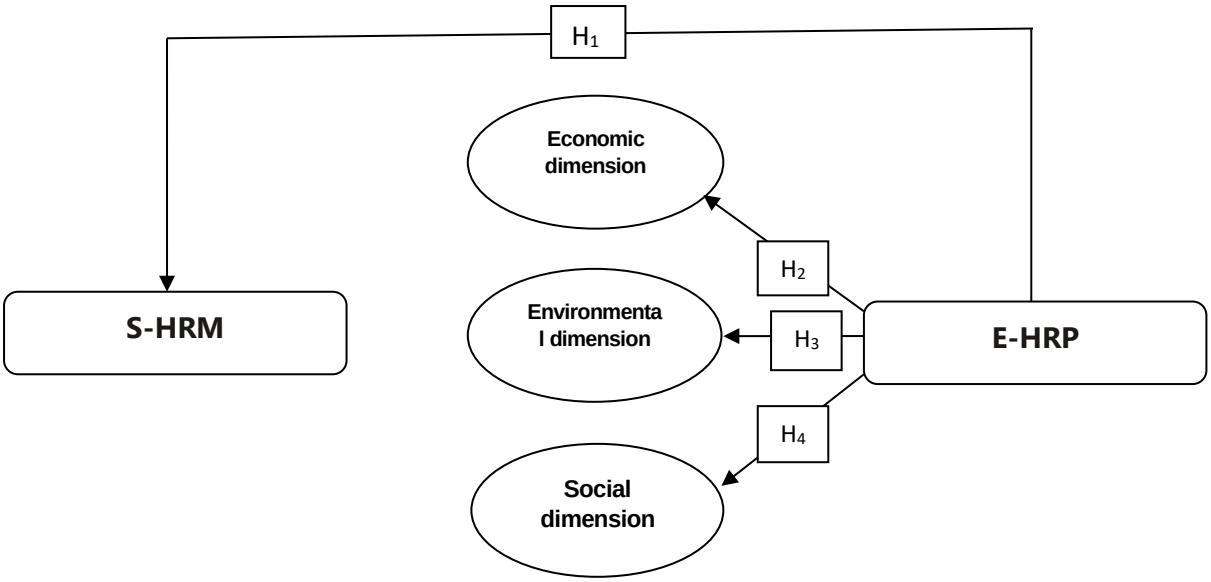
While the second dimension of human resource sustainability was the environmental dimension which is the activities and procedures of the organization that reduce negative environmental impacts, this dimension focuses on protecting ecological systems, conserving energy sources, and accessing renewable resources. The social dimension focuses on achieving social justice and justice in the distribution of natural and economic resources, promoting social interaction and participation in local communities, developing cultural diversity, and caring for employee rights. (Maternal, 2019: 195) The third dimension was transformational electronic human resource management which cared about strategic human resource activities such as knowledge management and strategic reorientation (Rewash & Swoop, 2012).

METHODOLOGICAL FRAMEWORK OF THE STUDY

This applied study attempted to identify the role of electronic human resource practices on sustainable human resource management in the Ministry of Higher Education and Scientific Research. This study began by reviewing the literature and presenting previous studies to extract the concept of electronic human resource practices and sustainable human resource management. A survey of employees of the Ministry of Higher Education and Scientific Research was conducted, and a questionnaire was distributed to employees of the Ministry of Higher Education and Scientific Research, so the study sample consisted of (180) employees, and all were retrieved. All questionnaires were valid for analysis, the survey consists of five parts. First: Paragraphs describing the characteristics of the sample. The second part included paragraphs related to electronic human resource management, and the third part included paragraphs related to sustainable human resource management, followed by a 5-point Likert scale to interpret

participants' responses to survey questions. The statistical test was used to test the research hypothesis. Smart PLS software (version 4.0.8.9) was used to test the study hypotheses. Electronic human resource practices (as an independent variable) was tested against "sustainable human resource management" (dependent variable).

Hypothetical chart



Data and Results

Demographic Data Analysis

The demographic data collected from the questionnaires were analyzed and distributed to a sample of the study population. The questionnaire was directed to employees working in pharmaceutical companies, where the population was 340 employees. A sample of 180 employees was selected.

Table3. DistributionoftheSamplebyDemographicFactors

DemographicVariable	Section	Frequency	Percent
Gender	Male	107	59.4
	Female	73	40.6
	Total	180	100.0
Educational level	Bachelor	138	76.7
	Master	22	12.2
	PhD	20	11.1
	Total	180	100.0
yearsofexperience	Lessthan10	60	33.3
	10-15	50	27.8
	Morethan15	80	44.4
	Total	180	100.0

Table (3) analyzes the gender, educational level, and years of experience of the study sample. The majority of respondents held a bachelor's degree and had long experience. This confirms the

efforts of pharmaceutical companies in Iraq to employ highly qualified human resources with good education.

Statistical analys results and reliability analysis

Table 4. Means and Standard Deviations

Dimensions	No.ofitems	mean	Sd.	Level
Electronic Human Resources Management	9	4.34	0.77	High
Economic dimension	4	4.28	0.78	High
Social dimension	4	4.58	0.74	High
Environmental dimension	4	4.18	0.72	High
Sustainable human resource management	12	4.32	0.79	High

Mean ranks (2.33 and less: low; 2.34 - 3.67: moderate; 3.68 and more: high)

Table (4) shows the means and standard deviations of electronic human resource practices and sustainable human resource management and its dimensions. The average values ranged between 4.18 - 4.58. Note that the electronic human resource practices reached (4.38) and the environmental dimension value reached (4.58) in the first place, while the social dimension value reached (4.18) in the last place. The overall score for electronic human resource practices and sustainable human resource management was classified as high with an average of (4.34) and (4.32) respectively.

This study was conducted on modeling the structural equation using covariance (CB-SEM) (for Covariance-Based Structural Equation Modeling) to test hypotheses, which is a statistical technique used to analyze data and relationships between variables. It is used in many fields such as management, economics, psychology, and social sciences (M. Hair, 2022, JF, Hult, G. T. M., Ringle, C. M., Sarstedt). Accordingly, the reliability of constructs and HTMT matrix were tested for validity using confirmatory factor analysis through the Smart PLS statistical program (version 4.0.8.9). Table (5) summarizes the convergent and discriminant validity results, as well as reliability indicators. The validity and reliability of the scale were verified through the table(5), In order to identify the face validity of the study scale and the possibility of adopting the scale, the scale was presented to an elite group of experts in order to give their notes. A number of necessary modifications were made according to the experts' opinions so that the questionnaire would be in its final form. Content validity was conducted for the scale as shown in Figure (2).

Table 5. Results of Validity and Reliability Tests

Constructs	1	2	3	4	5

				HTMT	
1. Economic dimension					
2. Social dimension	0.451				
3. Environmental dimension	0.385	0.441			
4. Sustainable human resource management	0.405	0.395	0.685		
5. Electronic Human Resources Management	0.412	0.436	0.551	0.385	
VIF	1.856	2.445	1.310	1.694	---
Loadings range	0.664-0.812	.701-0.764	0.653-0.792	0.703-0.788	0.682-0.771
BIC	-23.043	-25.600	-12.473	-14.982	---
AVE	0.562	0.530	0.542	0.563	0.583
Cronbach alpha	0.891	0.880	0.898	0.925	0.967
Composite reliability	0.899	0.891	0.899	0.930	0.970

Table (5) shows that the values of the standardized loading for individual items were within the ranges (of 0.653-0.812), which were above the minimum threshold for retaining items based on their standardized loadings (Al-Lozi et al., 2018; Sung et al., 2019). The average variance extracted (AVE) is a summary indicator of convergent validity that should be greater than 0.50. (Howard, 2018). The results showed that the AVE values for all constructs were greater than 0.50, indicating that the adopted measurement methodology has sufficient convergent validity. In covariance-based SEM, (Rimkeviciene et al., 2017) proposed a comparative approach as a way of dealing with discriminant validity assessment. The maximum shared variance (MSV) values are compared with the AVE values, and the square root of AVE is compared with the correlation with the rest of the structures. As a result, discriminant validity is considered an attribute of the measurement model used. Internal consistency was measured through Cronbach's alpha coefficient (α) and composite reliability by McDonald's omega coefficient (ω) as indicators to evaluate the measurement model. The results included in Table (5) showed that both Cronbach's alpha coefficient and McDonald's omega coefficient values were greater than 0.70, which is the minimum threshold for judging measurement reliability (De Leeuw et al., 2019).

Hypothesis testing

Study hypotheses: Throughout the research, attempts were made to verify the following research hypotheses:

Main hypothesis:

H0: There is no statistically significant effect of electronic human resource practices on sustainable human resource management in the Ministry of Higher Education and Scientific Research at a statistical level of 0.05.

The following sub-hypotheses were derived:

H0-1: There is no statistically significant effect of electronic human resource practices on sustainable human resource management for the Ministry of Higher Education and Scientific Research at a statistical level of 0.05 concerning the economic dimension.

H0-2: There is no statistically significant effect of electronic human resource practices on sustainable human resource management for the Ministry of Higher Education and Scientific Research at a statistical level of 0.05 concerning the social dimension.

H0-3: There is no statistically significant effect of electronic human resource practices on sustainable human resource management for the Ministry of Higher Education and Scientific Research at a statistical level of 0.05 concerning the environmental dimension.

The researchers applied logical analysis to test the proposed model in order to provide a complete explanation of the results related to the hypotheses by applying Bootstrapping analysis in Smart PLS software (version 4.0.8.9), where the test discovers the T value rate for the effect of electronic human resource practices on sustainable human resource management and the economic dimension, social dimension, and environmental dimension, represented in Figure (1) and the effect of electronic human resource practices on sustainable human resource management for this relationship is represented in Figure (2). Relying on the numbers in Table (6).

Figura 1. Standardized effects E-HRP on (Ed,Sd,End)

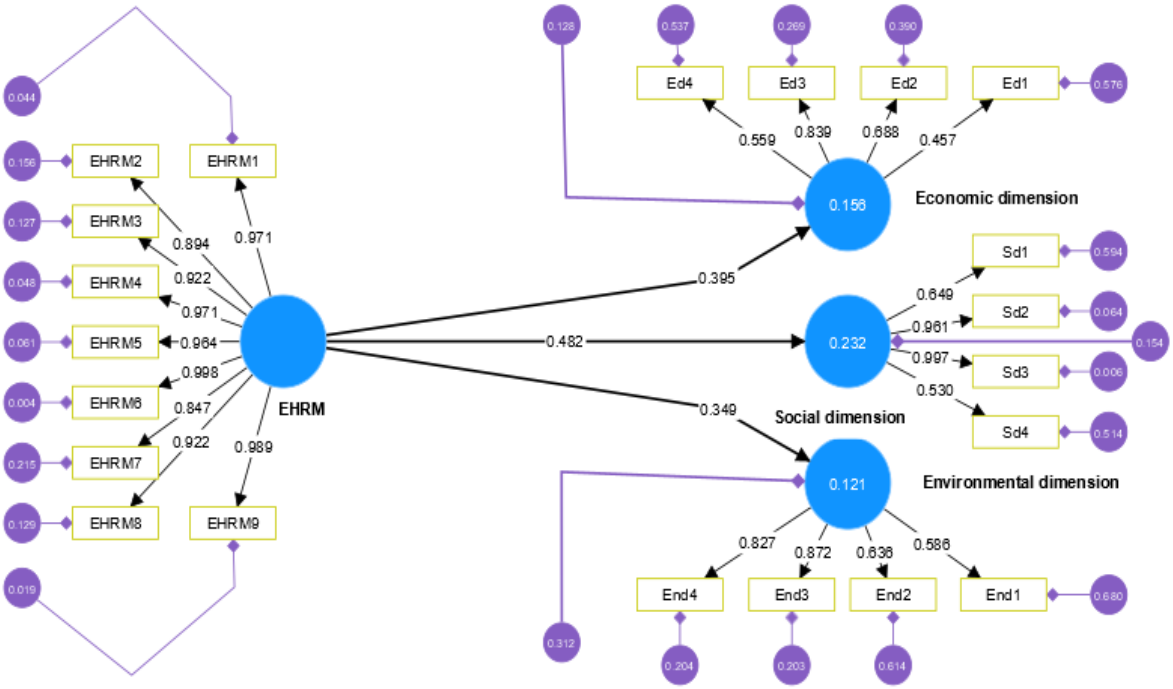


Figure 2. standardized effects E-HRP on (S-HRM)

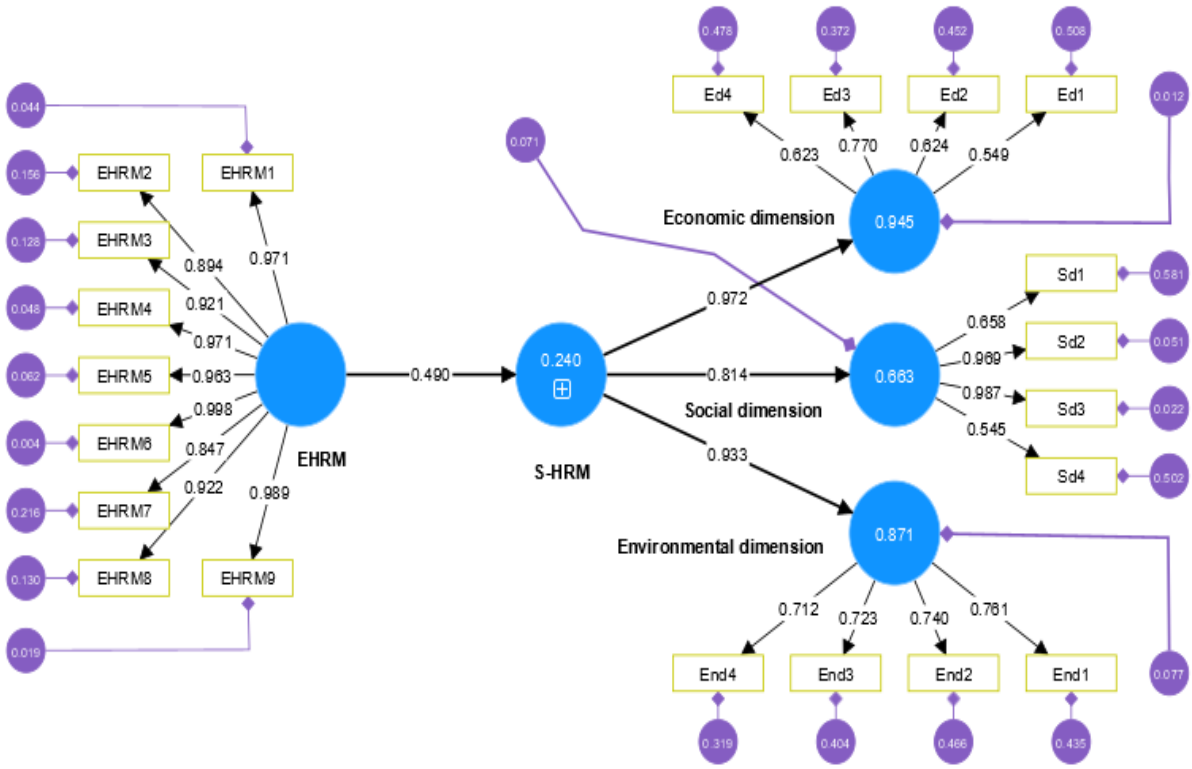


Table6. Standardized Effects

Hypothesis	Impactdirection	B	T	Prob	R^2
H0	Electronic Human Resources Management on Sustainable human resource management	0.495	5.497	0.000	0.240
H0-1	Electronic Human Resources Management on Economic dimension	0.395	2.785	0.006	0.156
H0-2	Electronic Human Resources Management on Social dimension	0.482	4.013	0.000	0.232
H0-3	Electronic Human Resources Management on Environmental dimension	0.349	2.925	0.004	0.121

Results of testing the main hypothesis

Table (6) presents the value of the impact of electronic human resource practices on sustainable human resource management, which was expressed through the standardized beta coefficient found to be (0.495), and the impact value was considered statistically significant since the Prob value equals (0.000) which is smaller than <0.05 value, thus the null hypothesis was rejected which concluded that electronic human resource practices does not affect sustainable human resource management.

Results of testing the first sub-hypothesis: According to the results provided by Table (6), the value of the impact of electronic human resource practices on the economic dimension was expressed through the standardized beta coefficient, where it was found to be (0.395), and the impact value was considered statistically significant since the probability value equals (0.006) which is smaller than <0.05, thus the null hypothesis was rejected and the alternative hypothesis was accepted.

Results of testing the second sub-hypothesis: According to the results in Table (), the value of the impact of electronic human resource practices on the social dimension was expressed through

the standardized beta coefficient, where (0.482) was found, and the impact value was statistically significant since the probability value equals (0.000) which is less than <0.05, thus the null hypothesis was rejected and the alternative hypothesis was accepted.

Results of testing the third sub-hypothesis: According to the results in Table (), the value of the impact of electronic human resource practices on the environmental dimension was expressed through the standardized beta coefficient, where the impact value (0.349) was found to be statistically significant since the probability value equals (0.004) which is less than <0.05. Thus, the null hypothesis was rejected and the alternative hypothesis was accepted.

RESULT DISCUSSION, CONCLUSION AND RECOMMENDATIONS

Result discussion

The results showed that there is a statistically significant effect of electronic human resource practices on sustainable human resource management practices for the Ministry of Higher Education and Scientific Research. The results demonstrated a statistically significant effect of electronic human resource practices on sustainable human resource management practices for the Ministry of Higher Education and Scientific Research concerning (the economic dimension, social dimension, and environmental dimension). In other words, the higher the level of electronic human resource practices, the higher the level of sustainable human resource management practices in the Ministry of Higher Education and Scientific Research. This result is attributed to the high level of awareness of the importance of sustainable human resource management and the ministry's pursuit of sustainable human resource management through the ministry's approach and culture and its reliance on modern technology to manage its operations through the continuous pursuit to develop information systems. Additionally, the ministry has good knowledge of the concept of sustainable human resource management and its role in maintaining proper sustainability. The results of this study are consistent with the results of (Al-Saidi & Fadhel, 2020), (Aggarwal et al., 2023), (Islam et al., 2019).

Through the overall average of the relative weights of the elements related to electronic human resource management, the study showed that the Ministry of Higher Education and Scientific Research electronically manages its human resources at an acceptable and appropriate level for administrative levels without overlap in powers and also has good protection of information that allows files to be retrieved in case of loss. The system also provides secure and accurate information used in planning and is flexible enough to accommodate any changes required by E-HRP. This has an important role in assisting in the implementation of sustainable human resource management practices. This result can be attributed to recent technological developments in developing administrative work methods that are imposed on institutions undergoing the transformation from traditional methods of doing business to electronic methods.

The results showed that the level of the economic dimension in sustainability is relatively acceptable at the Ministry of Higher Education and Scientific Research. The results proved that the Ministry of Higher Education and Scientific Research has practices to entrench the economic dimension of sustainability and provide incentives to employees who have awareness, interest and knowledge of the economic dimension of sustainability. Additionally, the economic dimension of sustainability has become part of the human resource management policy. The results of this study coincided with the results of the study by (de Juana Espinosa et al., 2013).

The results showed that the level of the social dimension is relatively high at the Ministry of Higher Education and Scientific Research. The results proved that the Ministry of Higher Education and Scientific Research works to strengthen social relations for everything related to the social dimension. The results of this study are consistent with the results of (Dempsey et al, 2011).

The results showed that the level of the environmental dimension is relatively acceptable at the Ministry of Higher Education and Scientific Research. The results proved that the environmental

dimension encompassed the concept of sustainable human resource management. The results of this study were consistent with the results of the study by (Bibri, 2020).

Conclusion

Some literature stated that electronic human resource practices such as (Nivoudi, 2014) enhances productivity through faster processing, a better work environment, reducing errors, quickly exchanging documented information, and allowing better and faster communication between all stakeholders. The study showed that adopting sustainable human resource management within the Ministry of Higher Education and Scientific Research contributes to achieving harmony and proper implementation of its plans, prioritizing, defining roles and responsibilities to ensure achieving the ministry's goals.

The results showed that most definitions of sustainable human resource management are very similar except for slight differences. The main focus of this concept is on "long-term investment in employees and creating a positive and responsible work environment". The researchers concluded the following definition: Sustainable human resource management is the management that focuses on building and continuously developing human capital, through long-term investments in training and development, healthcare and psychological care for employees, in addition to creating a positive work environment that encourages creativity, innovation, justice and equal opportunities. This management also cares about responsibility towards society and the environment, and is keen to measure performance from a holistic perspective that includes social, environmental and financial aspects. This human resource management views employees as partners and not just resources, by engaging them in decision-making and empowering them, with the aim of achieving sustainable growth and long-term value for the institution and society.

The results showed that the top three benefits of sustainable human resource management are: increasing employee productivity and effectiveness, attracting and retaining top talent, and enhancing organizational loyalty. The results showed that there is a statistically significant effect of electronic human resource practices on sustainable human resource management for the Ministry of Higher Education and Scientific Research with respect to (e-recruitment and e-selection, e-training, e-performance evaluation, e-compensation systems).

The result also showed that the higher the level of electronic human resource practices, the higher the level of sustainable human resource management in the Ministry of Higher Education and Scientific Research. This result is attributed to the high level of awareness of the importance of sustainable human resource management and the ministry's pursuit of sustainable human resource management through the ministry's approach and culture and its reliance on modern technology.

Additionally, the results proved that the Ministry of Higher Education and Scientific Research has practices to entrench a culture of sustainability and give priority to employees who have awareness, interest, knowledge and develop the knowledge and skills required for everything related to sustainable human resource management programs. In addition, these results may direct the Ministry of Higher Education and Scientific Research to maintain sustainable human resource management.

Recommendations

Incorporating digital technologies like artificial intelligence and machine learning in continuously developing and training employees**.**

Using e-learning management systems in building skills needed to keep up with sustainability requirements**.**

Leveraging e-performance management systems in enhancing employee efficiency and productivity**.**

Evaluating the effectiveness of e-interviews and e-recruitment in attracting diverse and inclusive talent.

Benefiting from big data and analytics to aid in making sustainable human resource management decisions.

Comparing traditional sustainable human resource management practices with modern sustainability-supporting practices.

Developing frameworks and models for integrating sustainability into core human resource processes.

Suggestions

Conducting a case study on a successful organization in implementing sustainable human resource management to achieve sustainability goals.

Studying the role of organizational culture in facilitating the transition to sustainable human resource management.

Longitudinal studies on the long-term impact of sustainable human resource management on organizational performance.

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CRediT AUTHOR STATEMENT

All authors have contributed equally to all parts of the work.