Human resource management shaped in a platform: a literature review[1]

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Abstract

Frame of the research*: The research investigates the key issues of electronic human resource management platforms from a business application perspective.*

Purpose of the paper: *The aim of this systematic literature review (SLR) is to shed new light on the key issues found in literature on electronic human resource management (e-HRM) platforms and to point out the main perspectives adopted in their business application. Ultimately, the goal is to provide insights for future research and highlight new managerial implications.*

Methodology*: In a SLR the number of papers on e-HRM platforms in the literature, the nature of the studies conducted, and the many definitions of key concepts have been investigated. Through a Multidimensional Scaling (MDS) analysis, the depth of the key issues is then analyzed, and their perspectives studied.*

Findings*: A definition of these platforms is given along with an explanation of their functionality, attributes and key issues. It is noted which journals write most about the topic, the provenance of the authors and how the topic is growing. What emerges from the MDS is that there are two perspectives to the analysis.*

Research limits: *The research may have limitations as the keywords used on the search platforms include certain papers, whilst excluding others that could be considered important by other researchers. The MDS is highly subjective.*

Practical implications*: It could be interesting to explore the critical and success factors of information technology and innovation.*

Originality of the paper: *Managers can use the MDS analysis and topics correlated to the thematic area to better understand these platforms. This study can help managers solve practical issues confronting companies.*

Key words: electronic human resource management; e-hrm; knowledge sharing platform; multidimensional scaling analysis; E-HRM issues; literature review.

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1. Introduction

We are living in a world that is becoming more competitive every day. For this reason, a successful organization must be able to share knowledge successfully and efficiently (Widen-Wulff and Suomi, 2007). It should be able potentially to integrate different organizational business value chains. This is why it is crucial that Information Technology (IT) is located within business processes, given its many applications in every aspect of our lives. Technology has transformed our lives; from the invention of the telegraph to the invention of the smartphone, it has changed the way we live and the way we do our jobs. This applies also to human resources management (HRM). For this reason, HRM must become digital (Halid, *et al.*, 2020). IT has transformed the way organizations recruit, select, motivate, assess and retain employees. According to some research, the leap from heterogeneous sources and systems to centralized information management on cloud-based human resource (HR) platforms brings organizational and business benefits. Managers can keep an eye on their employees' history, performance and potentiality (Forrester Consulting, 2019). For Forbes Business Council (2022), the responsibilities of the HR department have to be managed more effectively with the help of advanced digital solutions.

The issue is very topical as technology makes advances; it is only right that even those companies without an internal HR department, such as many Small and Medium Enterprises (SMEs), should be able to take advantage of these services. Some researchers claim that the size of an organization is insignificant (Hussain *et al.*, 2007), while others see it as a fundamental factor (Strohmeier and Kabst, 2009).

Technology is widely used to gather, recover, store and propagate data for commercial purposes. Platforms are shared by complementary goods that often interact with the main technology foundation to include some functionalities (Tiwana *et al.*, 2010). Platforms make HRM easier. The most widespread technology for HRM is Electronic Human Resource Management (e-HRM) that "can be concretized as the (planning, provision, implementation, operation and) application of IT for both supporting and networking at least two (individual and/or collective) actors in their shared performing of HR tasks" (Strohmeier, 2012).

E-HRM, through the Internet, allows managers and employees to have access to HR information and services. Consequently, e-HRM systems facilitate the implementation of strategies (De Alwis *et al.*, 2022).

Nowadays, the ability of companies to manage e-HRM platforms to access HR information and services and to implement business strategies, represents a competitive asset. However, the potential opportunities offered by these types of platforms remain still unexplored (Bissola and Imperatori, 2013). The literature hitherto on e-HRM has focused on value creation process (Hussain *et al.*, 2007; Bissola and Imperatori, 2013); some authors have highlighted the importance of cost reduction (Strohmeier, 2007; Bondarouk *et al.*, 2009), while others have emphasized the importance of assessment and effectivity (Ruel *et al.*, 2007) and the impacts of e-HRM adoption (Strohmeier and Kabst, 2009; Bissola and Imperatori, 2013).

So far, only a few authors have studied the opportunities offered by e-HRM. (Strohmeier, 2007; Sanayei and Mirzaei, 2012). Authors particularly address the competitive advantage that e-HRM tools could bring to organizations, while making managerial implications secondary.

In the past few years, three main literature reviews have been published on e-HRM platforms in general. Strohmeier and Kabst (2009) analyzed a first cross-national exploration of factors that influence the organizational adoption of e-HRM in Europe. More recently, Bondarouk *et al.* (2017) have identified the key factors for adopting e-HRM in organizations and have presented an overview of e-HRM impact. Furthermore, Poisat and Mey (2017) have provided a state-of-the-art review of e-HRM and explored studies into the relationship between e-HRM and organizational productivity.

Although e-HRM tools have been highlighted, specific issues and related business applications have not yet emerged, and managerial implications remain scant.

Against this scenario, the aim of this systematic literature review (SLR) is to shed new light on the key issues found in literature on e-HRM platforms and point out the main perspectives (and areas) adopted in their business application. Ultimately, the goal is to provide insights for future research and highlight new managerial implications.

The paper is structured as follows. A study of definitions and the focus areas of this research is found in section 2. The methodology used for the meta-analytical SLR is explained in section 3. This is followed in section 4 where the research question and the discussions of the results appear. Section 5 has a concluding discussion of the findings with future developments and managerial implications the research might reveal.

2. Definitions and focus areas

Before the 1990s, few authors conducted research into e-HRM, and therefore IT in HRM (Yang and Babapour, 2022). IT was used mainly to mechanize personal processes using outdated mainframe technology (DeSanctis, 1986). In those years, the term e-HRM was coined to refer to conducting HRM activities with the use of the Internet (Lengnick-Hall and Moritz, 2003). The very first platforms were designed in those years and adjusted to evolving technology.

Table 1 lists some e-HRM definitions found in the existing literature that prove useful in understanding the phenomenon. Ruel *et al.*'s (2007) definition focuses on the strategic aspect and on web-based technology channels. In the same year, Strohmeier (2007) introduces a networking concept previously not possible without the Internet, which underlines the existence of at least two partners. Al Shobaki *et al.*'s (2017) definition relates to the integration between HR and IT. Finally, the definition by Shamout *et al.* (2022) describes the benefits that these platforms bring to an organization. These definitions were chosen as they best represent these platforms and their evolution; they track interest in the topic back to the early 2000s and illustrate the development and evolution of e-HRM platforms over subsequent years.

Tab. 1: Definitions of e-HRM

Authors	Year	Definition
Ruel *et al.*	2007	"We define e-HRM as a way of implementing HRM strategies, policies and practices in organizations through a conscious and directed support of, and/or with the full use of, web-technology-based channels".
Strohmeier	2007	"The planning, implementation and application of IT for both networking and supporting at least two individual or collective actors in their shared performing of HR activities".
Al Shobaki *et al.*	2017	"The researcher defines the E-HRM as the process of integration between HRM and IT, using web- based applications in HRM".
De Alwis *et al.*	2022	"E-HRM is the use of IT in HR practices to make it easier for employees and employers to communicate with one another and for organizations to improve their HR skills".

Source: author's elaboration

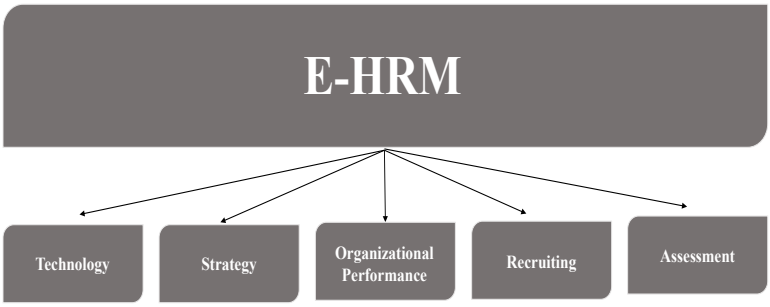
All the definitions describe the importance of technology (Ruel *et al.*, 2007; Strohmeier, 2007; Al Shobaki *et al.*, 2017; De Alwis *et al.*, 2022). Ruel et al (2007) explore the concept of strategy; organizational performance is mentioned by De Alwis *et al.* (2022); since recruitment and assessment are among the most important HR activities, their role is implicit in all the definitions (Ruel *et al.*, 2007; Strohmeier 2007; Al Shobaki *et al.*, 2017; De Alwis *et al.*, 2022). In the literature hitherto, scholars have drawn attention to the fact that these platforms need to be more strategic to have a longer-term perspective (Strohmeier and Kabst, 2009; Bissola and Imperatori, 2013; Bondarouk *et al.*, 2017). Scholars need to study current applications in order to have a more lasting perspective in future.

The earliest literature review of e-HRM was carried out by Gueutal *et al.* (2009). The phenomenon has developed to the present day and, according to the Scopus platform, the most cited literature analysis is by Bondarouk *et al.* (2017). Building on this analysis, the paper's intention is to expand the topic by investigating platform variables and conducting an MDS analysis.

Organizations can improve employee communication and satisfaction, and lower administration costs, through e-HRM. The most important platform, according to Forbes (2022), is Monday.com, a cloud-based e-HRM platform that allows organizations to allow for management variables and applications. Monday.com enables better visibility into employees' daily performance to ensure their success from the start.

An organization has different needs regarding e-HRM tools, preferring to implement different e-HRM key issues according to its vision. On this basis, through the literature analysis it has been possible to find five existing variables (figure 1).

Fig. 1: E-HRM variables



Source: author's elaboration

These variables found in the literature (Ruel *et al.*, 2007; Noe *et al.*, 2011; Sareen and Subramanian, 2012) were analyzed to understand the issues of interest to HRM and therefore to e-HRM platforms.

To confirm the variables, an analysis was carried out on 45 e-HRM platforms worldwide, in which all areas of interest on e-HRM platforms were studied and the five key issues found in the literature confirmed. These common issues are important for an in-depth understanding of the characteristics of e-HRM platforms. However, not all platforms have all five of these issues.

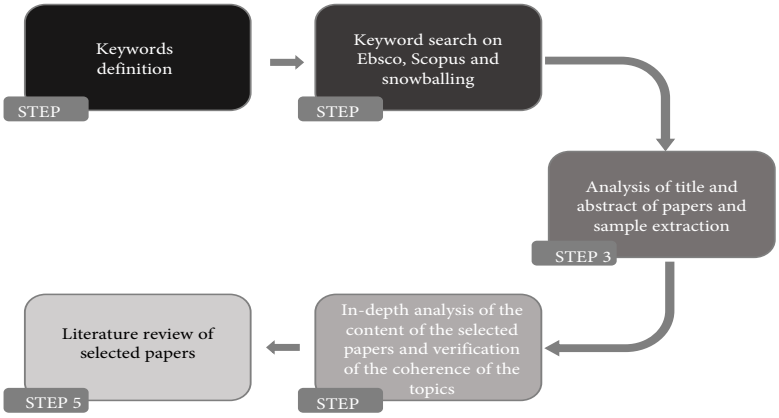
3. Methodology

To better interpret the phenomenon, a Meta analytical SLR (Paul *et al.*, 2020) was conducted, using a PRISMA article selection (systematic database search and cross-reference snowballing is illustrated in figure 2), following the recommendations of Geissdoerfer *et al.* (2018) and Grieco and Iasevoli (2017). The steps (McInnes *et al.*, 2018) include the "Identification," "screening," and "included".

The objective of this SLR is to shed new light on the key issues found in e-HRM platform literature and to point out the main perspectives adopted in their business application. The ultimate aim is to provide insights for future research and highlight new managerial implications.

The keywords selected for the analysis were chosen after surveying the relevant papers. A decision was made to use the keywords found in Ottolenghi (2021), given the author had first studied the papers' keywords and then run a bibliometric analysis on them on VOSviewer software. To further confirm these choices, articles were read carefully to understand what keywords were used. Additionally, e-HRM platforms operating worldwide were analyzed to ascertain the terms used to define themselves.

Fig. 2: Sample approach



Source: author's elaboration

In the identification step, the search criteria (table 2) were developed including the terms "e-HRM", "Knowledge sharing platform", "e-lancing", "gig-work", and "electronic human resource management". "Article title, or Abstract, or Keywords" were used to search for articles in English on the EBSCO and Elsevier Scopus databases.

Since identified articles must be screened in the PRISMA 2020 flow diagram, the eligibility of each article was ascertained and articles not matching the inclusion criteria were delated. This screening was done both by automation and manually.

Tab. 2: Literature search strings

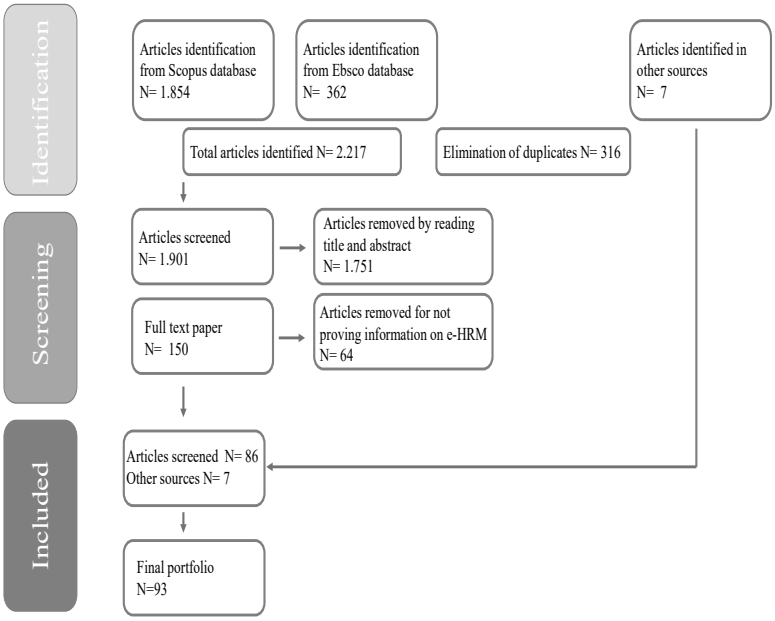
Search string	Search field	Number of non-exclusive results	
		Scopus	EBSCO
e-HRM	Topic/Article title, Abstract, Keywords	279	87
Knowledge sharing platform	"	1,497	47
e-lancing	"	6	9
Gig-work	"	68	208
Electronic human resource management	"	4	12
Total			2,217

Source: author's elaboration

In these first steps, the analysis carried out was extensive; it included different disciplinary areas such as human sciences, engineering, medicine, etc., and differently ranked journals. Subsequently, a funnel approach was used to gradually narrow the study's boundaries and where the abstracts of identified publications were scanned to define an initial sample of relevant literature, as in figure 3. The timeframe considered goes from 2004 (the year Ruël, *et al.* (2004) published their paper, since when many

international authors became interested in the phenomenon) to March 2022. After finding and selecting the texts, papers from a snowballing search were added. The initial sample was composed of 2,217 papers (1,854 from Scopus and 362 from EBSCO); while reading other relevant articles, the author found a further 7 papers of interest and added these through snowballing research. These papers found through snowballing research (while searching for other relevant articles in other software) have the potential to enhance the analysis. Of these 2,224 articles, 150 were selected after a first read of the abstract (figure 3). As is noted from the large number of unselected papers, there were many that fell outside the focus of the research, even though some links with keywords were ascertained in the research. For example, many articles focused on topics not close to HR such as medicine or school education; the reason being that these platforms are very useful in a hospital and educational setting. This phase was useful in defining and validating different approaches adopted for classifying papers and the subsequent MDS analysis. The last reading phase (full texts) led to the exclusion of other papers not aligned with this paper's objective. This step led to a selection of 93 articles in total, forming the basis of the analysis.

Fig. 3: Results of applying PRISMA



Source: author's elaboration

The next step involved an analysis of the 93 articles. To provide a structured approach to the review, classic variables were selected based on the existing literature (Hossain, 2016; Pisoni *et al.*, 2018), including year of publication, journal, citation and methodologies used. Starting from

the study of the relevant literature and an inductive category development approach, in which the researcher immerses herself in the data to allow new insights to emerge (Kondracki *et al.*, 2002), the decision was made to use the five variables given in figure 1 and conduct an MDS analysis. The variables are: Technology, Recruiting, Assessment, Strategy and Organizational Performance. The MDS analysis was carried out to identify the depth or otherwise the topics and the correlation between them. To do so, it has been decided to analyze each paper according to certain approaches to give a clear picture of the topic.

Kruskal (1964) explains what an MDS analysis is. He believes that this technique can offer a visual, clear and simple representation of the strings presented as points on a map. This method allows us to understand similarities and dissimilarities between elements in the configuration.

Starting from the 93 articles studied in the SLR, the author analyzed them individually based on the 5 variables mentioned above (as described in section 2, figure 1). For each paper, the basic question was "how deeply connected is the following issue to e-HRM and how does it deal with it?" for each thematic strand of the analysis. Scores were given from 1 to 6, as in table 3.

An initial meeting was held with two experts in the field (including one professor and a manager) to share the method and to establish the correct evaluation. Scores were given firstly by the author and subsequently checked by the experts according to the coding scheme. In the very few cases of divergence, a more in-depth analysis was carried out.

Tab. 3: Criteria for MDS

MDS		Criterion					
		1	**2**	**3**	**4**	**5**	**6**
Factors	Technology	Not covered	Brief mention	Brief topic description	Wider description	Extensive multi-paragraph description	Many dedicated sections
	Recruiting						
	Assessment						
	Strategy						
	Organizational Performance						

Source: author's elaboration

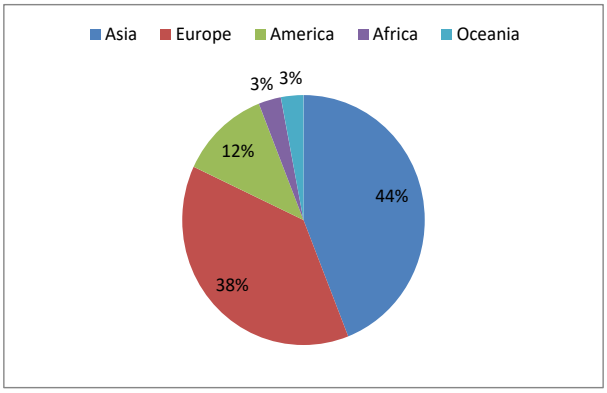
4. Results

In order to shed new light on the key issues underlying the literature on management e-HRM platforms and to point out the main perspectives adopted in their business application, the author studied the phenomenon's evolution over the years and the concepts underpinning the phenomenon. This was explored by studying the main topics in the literature, the main methodologies deployed, the journals where the topic features, the countries of provenance of the authors where the topic is more predominant, the principal industry of reference, the depth of certain variables (through the MDS analysis) and relations to each other.

As far as the quantitative results of the literature analysis are concerned, the 93 papers analyzed (mentioned in the Appendix) come from 57 journals. Specifically, 5 articles come from the Journal of Knowledge Management and the other 5 from the Human Resource Management Review. The others were published with an average of 1 to 3 journals per article.

The 93 papers considered in this analysis included 266 authors, with an average of 2.86 authors per paper. The authors were from 33 different countries. Nearly half of this sample (figure 4) comes from Asia (44%); other significant percentages are from Europe (38%) and America (12%), followed by Africa (3%) and Oceania (3%).

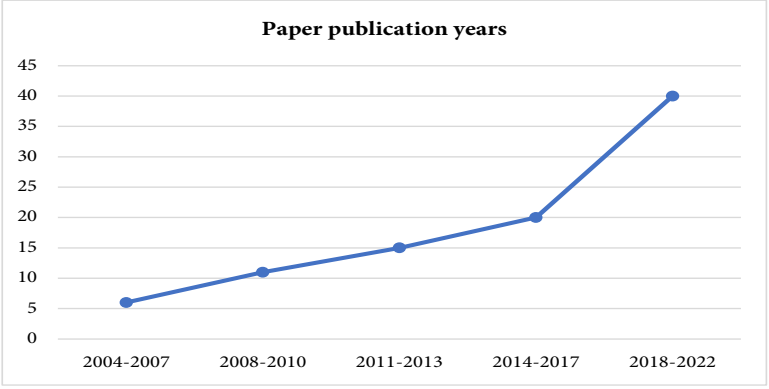
Fig. 4: Continent of origin of authors



Source: author's elaboration

There has been a modest increase in publications per year in this specific topic (figure 5). There were only 6 papers published in the chosen timeframe 2004–2007, 11 in the period 2008-2010, 15 papers in the years 2011-2013. In the years 2014-2017, 20 articles were published; in the timeframe 2018-2022, 41 relevant papers were written.

Fig. 5: Number of articles per year



Source: author's elaboration

It is possible to note an almost equal division of methodologies used (figure 6). Empirical studies are narrowly in the majority (54%), while theoretical studies are slightly less than half (46%). The methodologies adopted in the empirical studies, represented in figure 7, were mostly quantitative (30%), followed by a good number of framework (19%) and theoretical studies (19%). A significant proportion of the studies involved qualitative analysis (11%) and literature reviews (9%). There was also 13% composed of other typologies of studies, such as experimental studies, focus groups, case studies, cluster analysis, etc.

Fig. 6: Adopted methodologies

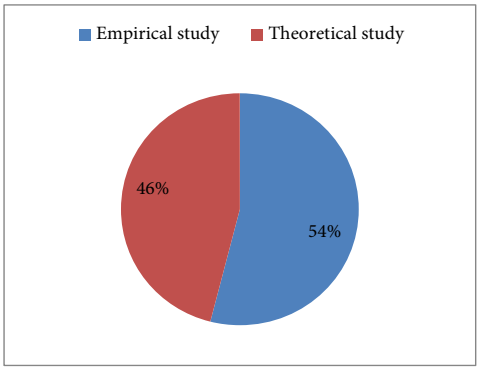
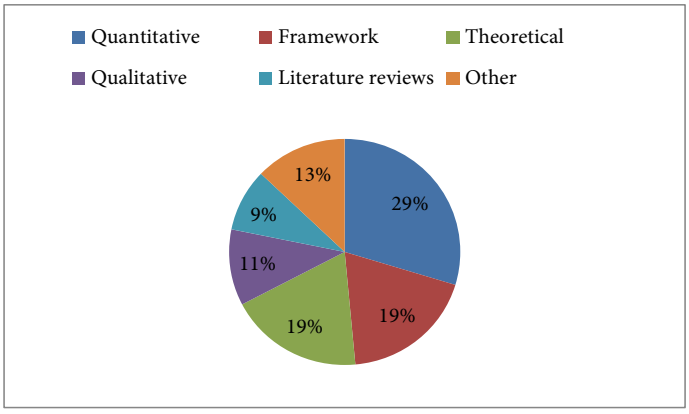


Fig. 7: Adopted studies



Source: author's elaboration

In table 4, the most cited article (based on Google Scholar) is by Strohmeier (2007). This paper is widely used in the theoretical section to analyze e-HRM platforms. This analysis brings out an introductory work from different disciplines and relates to different analyses and different subjects of e-HRM. The second was published by Ruël *et al.* in 2004. Its aim is to demystify e-HRM by studying its goals and different typologies. The third most cited is by Vallas and Schor (2020), where the authors

identify four major themes in the literature and the underlying metaphors associated with each; the fourth, written by Stanford (2017), illustrates the major features of the platforms, while the fifth by Shang *et al.* (2011) is about Web 2.0 services and the different levels of knowledge exploitation. The top 5 most cited articles are focused on: gig-work (2 articles), e-HRM (2 articles) and knowledge sharing platforms (1 article).

Tab. 4: Top 5 most cited articles

Author(s)	Title	Year of publication	Country of publication	Number of citations
Strohmeier	Research in e-HRM: Review and implications	2007	Germany	884
Ruël *et al.*	E-HRM: Innovation or irritation. An explorative empirical study in five large companies on web-based HRM	2004	Netherlands	763
Vallas & Schor	What do platforms do? Understanding the gig economy	2020	USA	514
Stanford	The resurgence of gig work: Historical and theoretical perspectives	2017	Australia	318
Shang *et al.*	Understanding Web 2.0 service models: A knowledge-creating perspective	2011	China	234

Source: author's elaboration

After studying these 93 papers and some of the best-known definitions of these platforms, a new definition has been provided, based on the study of the papers and the analysis of e-HRM platforms. In order to include the new potential of technologies and the features today's platforms have, it is appropriate to update the definition:

"E-HRM platforms aim to create value for organizations and employees, through networking where different stakeholders interact with each other even if they have different roles. The goal is to create value at all stages of HR value chain".

Turning now to the MDS analysis, the results are shown in table 5.

Tab. 5: MDS scores

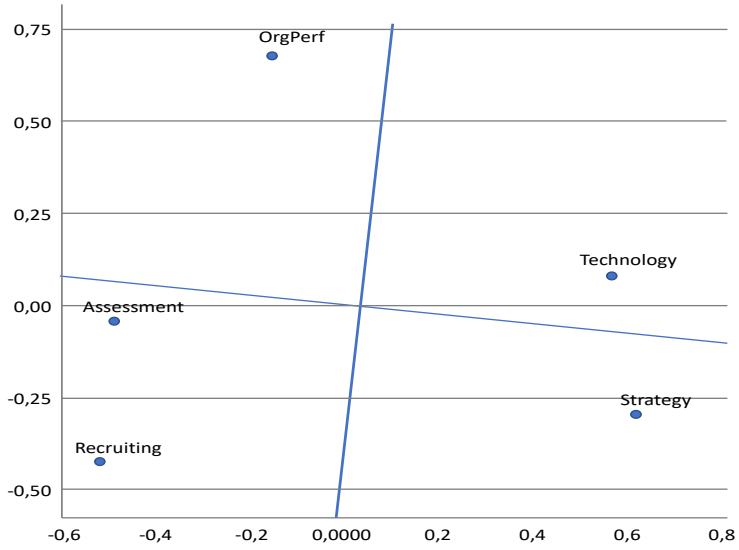
	Average score	Variance
Technology	3.7	2.160
Recruiting	2.1	2.359
Assessment	2.1	2.101
Strategy	3.6	2.681
Organizational Performance	2.8	2.682

Source: author's elaboration

As to the analysis of variance, it is possible to note that variance is similar to the scores. There are situations where, for example, Assessment, Recruiting, and Organizational Performance have only a few points, and others where there are many points of difference, as is the case with Technology and Strategy. After identifying the techniques, the MDS analysis was designed. The final data was therefore 465, given 93 papers and 5 dimensions. Through the software SPSS version 28, an MDS Proxcal was made (figure 8).

An examination of S-stress (0.030) and Stress-1 values (0.108) validate that a two-dimensional data solution is trustworthy and that the map can identify latent semantic dimensions. The literature shows that there are five key issues and from this, two perspectives can be highlighted.

Fig. 8: MDS



Source: author's elaboration

Figure 8 indicates that the five identified issues are at the end of the two axes representing the two perspectives that characterize them. The first perspective is the tactical-strategic point of view, depending on whether the focus is on tactical actions (short-term activities) or strategic (long-term). The latter includes articles where e-HRM are analyzed with a tactical or strategic perspective, i.e., with a short or long-term perspective.

The second analytical perspective is performance-activity. The latter includes those articles where e-HRM platforms include performance or activities variables; these studies define the term in a more general way that includes the different typologies of e-HRM. What emerges is an inversely proportional relationship between performance and activity issues: the more a study focuses on a specific e-HRM issue typology, the less it aims to provide a strategic view; rather, it is mostly concerned with its tactical effect.

In the following is the analysis of the four areas these perspectives create.

Area 1: In the tactical-activity area there is a group of papers that tend to deal with assessment and recruitment. They generally have a short-term perspective, hence tactical, and a fundamentally activity-based perspective. Rushit and Jegan (2019) are to be mentioned with their descriptive study as they analyze the implementation of e-HRM and its impact on organizational commitment.

Area 2: The tactical-performance area encompasses studies related to the organizational performance perspective with a tactical point of view, hence short-term perspective. An example is Al Haziazi's work (2019) which examines the link between e-HRM activities and organizational performance and develops a conceptual framework relying on transactional, relational and transformational activities. As shown in the example, all papers in this area look only at short-term performance (Al Haziazi, 2019; Poba-Nzaou *et al.*, 2020; Khawaldeh, 2020).

Area 3: The performance-strategic area includes those works linked to technology not analyzed from an organizational point of view, but from a strategic one. To name an example, Bellesia *et al.* (2019) in their work investigate digital platforms, intended both as providers of technological features and online environments.

Area 4: The group of papers in the activity-strategic area, have a more strategic view of key issues, therefore, actions that can be done (working-time monitoring, rewards, etc.) have a more strategic aspect. An example to mention is the paper by Kuhn and Galloway (2019), a guest editorial published in the Journal of Managerial Psychology where the authors seek to expand perspectives on gig work and gig workers. The authors feature activities with a strategic perspective, in line with many other authors in this area (Hooi, 2006; Subhashree and Vasantha, 2020).

From this analysis it is noted that there tends to be a perspective of studies with a more tactical and short-term perspective while, when looking at the important functionalities like assessment and recruitment, they are not read with a strategic perspective, which should be important for a longer-term view of e-HRM platforms.

It has been noted that papers that have a more technology-based focus, also have a longer time perspective by having a strategic point of view; when looking at tools, and more specifically at organizational assessment and monitoring activities, this longer-term perspective is missing.

5. Conclusions and managerial implications

In accordance with the paper's primary goal, many attempts to systematize contributions on e-HRM platforms have been made; this confirms the increasing attention given to this topic by scholars. Compared to the previous literature analyses studied, the main aim is to shed new light on the key issues underlying literature on e-HRM platforms and point out the main perspectives adopted in their business application.

Data were first provided and then analyzed, defining what these platforms really are, to understand their issues and attributes. Research questions were then presented to address the gaps in the topic areas.

During the analysis, results show which journals write most on the topic, the countries the authors come from (mainly Asia), and that the timeframe 2018-2022 has been the most prolific, showing how the topic has been growing quickly in the last few years. In more recent years, e-HRM platforms were declined as follows: there are five key issues (technology, strategy, organizational performance, assessment and recruiting) and two main perspectives (tactical-strategic and performance-activity).

The results reveal new insights into the theoretical foundations and the key issues underpinning e-HRM platforms in general and their relevance through an MDS analysis. In addition, the growing number of studies that define the importance of such platforms and clarify their key issues may stimulate more dynamic theories and promote research designs that explicitly investigate the development of e-HRM platforms and their future developments.

This paper could therefore help identify future research lines on the topic. Although some authors who have analyzed the impact of e-HRM platforms (Strohmeier and Kabst, 2009; Bissola and Imperatori, 2013; Bondarouk *et al.*, 2017) have emphasized that the use of these platforms should take a long-term view, the literature actually has a more tactical focus. Many papers look only at short-term performance; for this reason, scholars should study these platforms with a longer time perspective in mind. From a theoretical point of view, it would be interesting in future research to develop an analysis with a more strategic perspective.

The paper does have some limitations, mostly in relation to the adopted methodology, such as the choices made concerning the keywords used and, as a consequence, the articles included in the analysis.

In particular, the adoption of the term e-HRM led to the exclusion of other terms related to the specific phenomenon so that, given rapid developments in recent years, the keywords used may not fully express the issue. The criterion was to include only those articles in which these typologies were analyzed relating to the overall concept of e-HRM. It is recognized that this can be seen as a limitation, but it also opens a path for further studies. Another limitation might be related to the databases used, as some papers relevant to the research might not be in the one analyzed.

Furthermore, the selection of the particular subject areas to be analyzed in the MDS could be subjective. However, the S-stress value can mitigate this risk, suggesting that the representation of the data is reliable, and that the map can identify latent semantic dimensions.

Managers should use the analysis to understand better the key issues regarding these platforms. The analysis provided by this study can help managers solve practical issues that companies might face. A better framing of e-HRM platforms and their main key issues allows the identification of processes and methodologies that can help companies better understand how they can benefit from the adoption of e-HRM platforms that can lead to the development of entirely new markets.

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