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A BIBLIOMETRIC ANALYSIS OF THE THEORY OF DIGITALIZATION OF HUMAN RESOURCE MANAGEMENT PROCECESES

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Purpose: The aim of the study is to analyse the existing scientific literature on the digitalization of human resource management processes to identify the most researched topics, gaps in the literature and key research and technology trends that can inform future research in this area.
Design/methodology/approach: A systematic literature review is a suitable method for exploring interest in the topic of digitalization of HR processes and the emergence of possible HR process models, as it allows for a comprehensive examination and synthesis of existing knowledge in this area, identifying key aspects, methods and research gaps.
Findings: This study highlights key links between the digitization of HR processes and key management theories and practices, identifying important trends, influential publications and emerging research gaps. Through a comprehensive bibliometric analysis, the study not only approximates the current state of knowledge in HR digitization but also provides valuable insights for future research on modern and sustainable HR management practices.
Research limitations/implications: The database queries were restricted to articles published in English for 2018 up to 2024. Although the topic is frequently raised at conferences and widely discussed, there is still a lack of scientific research, as evidenced by the small number of articles in relation to the number of papers given.
Originality/value: The findings reveal that digital transformation encompasses advanced recruitment technologies, HR analytics, and the development of digital competencies, all of which are crucial for organizational success in a rapidly evolving environment. The study highlights the COVID-19 pandemic's role as a catalyst for remote work and e-recruitment, emphasizing the need for organizations to adapt quickly to new operational models.
Three thematic clusters were identified: the strategic integration of digital technologies, the impact on HRM processes, and the adaptation of competencies in response to technological changes. This article contributes to the field by synthesizing existing models, addressing gaps, and proposing future research directions that focus on advanced technologies, employee well-being, and organizational culture transformation.
Keywords: Digital transformation, human resource management, bibliometric analysis, HR analytics, remote work, digital competencies.
Category of the paper: Literature review.

1. Introduction

Today's organisations operate in a dynamically changing environment in which digital technologies are playing an increasingly important role. Digital transformation is one of the main drivers of civilisation, encompassing almost all spheres and processes, including education, science and human resource management (Ergasheva et al., 2024). The fourth industrial revolution (Industry 4.0) is transforming the world of work, business models, strategies, stakeholder relations and processes and skills. The introduction of new technologies is causing widespread automation and irreversible changes in the structure of workplaces (Poisat et al., 2024).

Digital transformation brings both opportunities and threats to organisations (Straková et al., 2022). Opportunities include increased efficiency, innovation and competitiveness, as well as better alignment with customer needs (Ergasheva et al., 2024). However, there are also challenges related to the need to adapt to new technologies, changes in work structures and potential threats to privacy and data security (Karwehl, Kauffeld, 2021).

Recruitment in the context of digital transformation is under significant change, evolving from traditional methods to advanced digital techniques. Increasingly, e-recruitment, or online recruitment, is being used to offer new opportunities in candidate selection (Habachi et al., 2022; Vedernikov et al., 2022). In this context, Smart HR Recruiting technology is being used for remote staff selection (Vedernikov et al., 2022). Transformation driven by technological advances creates new opportunities but also challenges, requiring companies to be flexible, invest in new technologies and continuously develop the competencies of HR teams (Chin et al., 2024; Wodecka-Hyjek et al., 2024).

Competence development is a key element in the context of digital transformation and the changing labour market (Ergasheva et al., 2024; Karwehl, Kauffeld, 2021). In the digital age, it becomes particularly important to develop digital competences. These competencies include digital literacy as well as the ability to adapt to a changing digital environment (Boiko et al., 2023). In the context of remote working, developing digital competences and work organisation skills is particularly important. Companies need to invest in the development of their employees' competencies to remain competitive and meet the challenges of the digital economy (Ergasheva et al., 2024; Karwehl, Kauffeld, 2021; Zhang, Chin, 2024).

Today, HR analytics is becoming one of the key trends. Data analytics uses advanced technologies to analyse data about employees, HR processes and the organisation, enabling the identification of trends and optimisation of HR activities (Erro-Garcés, Aramendia-Muneta, 2023). Key applications include performance measurement, process optimisation decision support, talent identification and cost reduction (Malik et al., 2023). Implementing HR analytics requires competence, infrastructure and awareness of the challenges of data protection and interpretation of results (Ergasheva et al., 2024; Erro-Garcés, Aramendia-Muneta, 2023).

The COVID-19 pandemic significantly accelerated the digital transformation of human resource management, forcing organizations to rapidly implement remote work solutions. This shift highlighted the need for advanced e-recruitment methods, virtual onboarding processes, and digital tools for workforce management (Vedernikov et al., 2022; Al-Alawi et al., 2023). As companies adjusted to these changes, they faced challenges related to employee engagement, trust-building, and the development of digital competencies, underlining the crucial role of strategic HR management during times of crisis (Poisat et al., 2024; Urbaniec et al., 2022).

Despite the growing interest in the digitisation of HR processes, there is still a lack of in-depth research into the specific challenges and opportunities of implementing technology in specific HR areas and the concerns of employees towards these changes. There is a need to develop digitisation models that take into account the employee experience, the development of digital competences and integrate the different stages of transformation. Furthermore, there is a lack of an organisational culture transformation model to support the effective implementation of digital change in HR management.

This article reviews the literature on these issues, exploring the complexity of digital transformation in the context of human resource management. The analysis covers both theoretical and empirical aspects, providing insights into the latest trends and challenges in this rapidly evolving field.

The aim of the study is to analyse the existing scientific literature on the digitalization of human resource management processes to identify the most researched topics, gaps in the literature and key research and technology trends that can inform future research in this area. Research questions to understand the current state and future directions of the field are:

RQ1: What key research trends related to HR digitization identify emerging areas for future research?

RQ2: What are the gaps in the current literature on HR process digitization?

RQ3: What issues related to the digitization of HR processes are most researched and of greatest interest today?

The article has the potential to make an innovative contribution by synthesising existing models of HR digitalisation and identifying their shortcomings, particularly in relation to employee experience, digital competence development and organisational culture transformation, which is a gap in the current literature. Furthermore, innovative approaches require the inclusion of advanced HR analytics, including artificial intelligence, to optimise processes. The study located research gaps using Miles' (2017) gap typology.

The structure of this manuscript is organized as follows: Chapter 2 presents a review of the literature on TPB and CE. Chapter 3 outlines the research methodology. Chapter 4 analyzes the findings, highlighting research gaps, limitations, and directions for future studies. The manuscript concludes with the final chapter summarizing the key points.

2. An overview of the literature

Digitalisation of HR processes is the process of transforming traditional HR functions and practices through the implementation of digital technologies (Zhao et al., 2024). Sources emphasise that digitisation is not just a simple transfer of analogue processes to a digital environment, but represents a fundamental change in the way HR functions and delivers value to the organisation (Nicolás-Agustín et al., 2021). Digitalisation is seen as a factor that significantly affects HRM processes, but detailed models that comprehensively capture these changes are lacking. Sources highlight that the digitisation of HR includes the automation of routine tasks, the implementation of e-HRM systems, improved communication and collaboration (Nematollahi et al., 2024), the use of data analytics (Malik et al., 2023), the development of digital competencies, and adaptation to remote recruitment and onboarding (Boiko et al., 2023). HR experts see digitalisation as a key societal trend (Ruiz et al., 2024), which affects business at all levels, highlighting the uncertainty that accompanies it (Demir et al., 2022). As an external force driving change, digitalisation poses challenges for managers, requiring new HR competencies and flexible operating models (Vardarlier, 2020).

Modern technologies, such as big data, artificial intelligence and machine learning, make it possible to perform tasks that require cognitive abilities (Makridakis, 2017). Imphan HRM processes, predictive analytics makes it possible to anticipate staffing needs, the risk of employees leaving, and monitor their performance (Ma, 2023). Sources show correlations between the use of analytics data and various aspects of HRM. In the context of HR analytics, sources point to the potential of data in HR decision-making. Data analytics can support the processes of recruitment, selection, employee development, as well as monitoring performance and engagemen (Anghel, 2023; Bril et al., 2021; Karwehl, Kauffeld, 2021). It makes it possible to predict future staffing needs, analyze the risk of employees leaving, and forecast employee performance (Erro-Garcés, Aramendia-Muneta, 2023; Nematollahi et al., 2024). However, there is a lack of comprehensive models for using advanced data analysis techniques such as machine learning and artificial intelligence in HR processes. It is predicted that in the future, HRM systems will be able to predict HR needs, monitor employee sentiment and adapt HR strategies to the changing environment (Ma, 2023).

In the context of strategic human resource management, sources (Zhao et al., 2024) emphasize the importance of human capital as a key resource of the company. The development of HRM is analyzed in relation to the resource theory of the firm, which focuses on unique resources and competencies as sources of competitive advantage. Changes in the employment structure are also analyzed, where the role of the human factor in the value creation process is important alongside automation. In this context, knowledge management and the development of employee competencies to meet the demands of the new reality are also important. Sources note the importance of training and developing employees in a changing environment.

In addition, ethical use of data and protection of employee privacy are important (Karwehl, Kauffeld, 2021; Zhang, Chin, 2024).

The literature indicates that the pandemic acted as a catalyst for adopting digital HR practices, particularly in remote recruitment and employee development (Vedernikov et al., 2022). Studies also emphasize the importance of Smart HR Recruiting technologies, enabling companies to maintain operational efficiency while adapting to rapidly changing environments (Al-Alawi et al., 2023). This period of transformation has underscored the long-term value of digital competencies for both HR professionals and employees.

Over the past decade, office work has undergone a transformation, with routine tasks being replaced by more flexible and knowledge-based ones. Research indicates that effective information management, ensuring employees have access to the right data at the right time, should become a priority for organizations, just as industrial automation was key in the past (Attaran et al., 2020). In the future, technology will continue to support flexible work arrangements. This could lead to a minimization of demand for physical offices and an increased role for virtual teams (Kim et al., 2021). Digitization may lead to a work model in which, employees are less dependent on traditional organizational structures and have more autonomy to manage their own tasks (Zhang, Chen, 2023).

The literature points to the need for a holistic view of the impact of digitization on HRM. The development of innovative models that address technological, social and cultural challenges is essential if digital transformation is to effectively support the development of organizations. At the same time, HR remains a key element in supporting employees in adapting to new working conditions and organizational strategies (Al-Alawi et al., 2023).

In conclusion, the literature review points to the urgent need to develop innovative models that holistically capture the impact of digitalization on HRM, as well as address the challenges and opportunities of digital transformation in organizations. Zhao et al. noted that even for traditional manufacturing companies, digitalization is inevitable at this stage of strategic transformation (Zhao et al., 2024). Mihova and Ivanova (2020) point out that industrial companies must invest in HR digitization to gain a competitive (Mihova, Ivanova, 2020). Digitization brings significant social change, highlighting the indispensable role of technology in maintaining competitiveness and market position (Halid et al., 2020). Organizations are gradually adopting digital technologies to optimize HR processes, but there is still great potential for further development and implementation of advanced digital solutions (Carlisle et al., 2021).

3. Research methods

A systematic literature review is a suitable method for exploring interest in the topic of digitalization of HR processes and the emergence of possible HR process models, as it allows for a comprehensive examination and synthesis of existing knowledge in this area, identyfying key aspects, methods and research gaps (Figure 1). It enables the development of new theoretical frameworks and the validation of applied theories, which fosters the search for innovative solutions. Through a structured approach, the review can help to understand the complexity of the topic and set directions for future research (Paul, Criado, 2020). For the purposes of bibliometric analysis, the research utilized the Scopus database. Scopus is a database frequently utilized in academic research places a strong emphasis on social science content (Ungaro et al., 2024).

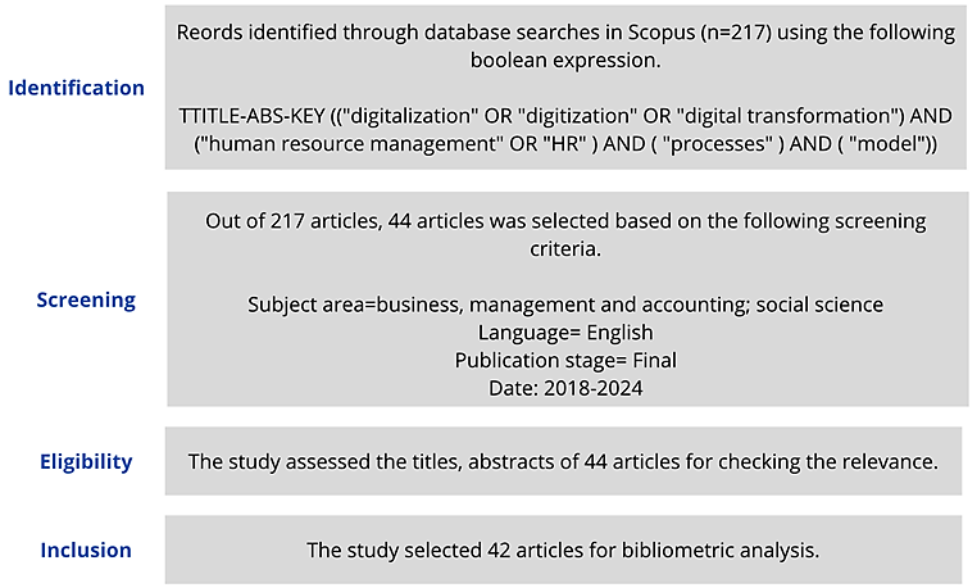

Figure 1. Stages of the research procedure.

Source: developed by authors.

The database queries were restricted to articles published in English for 2018 up to 2024. Although the topic is frequently raised at conferences and widely discussed, there is still a lack of scientific research, as evidenced by the small number of articles in relation to the number of papers given.

4. Performance analysis and science mapping

Bibliometric analysis is based on two fundamental approaches: performance evaluation and science mapping (Donthu et al., 2021). Performance analysis and science mapping are complementary methods of analysing the literature, providing insights into the development and structure of the field. Performance analysis assesses the impact of publications through citations, influential authors, journals, and trends, using bibliometric and statistical tools, without content analysis. Science mapping visualizes the structure of a field by analysing citations and co-citations to identify key areas, author collaborations and thematic changes (Paul, Criado, 2020).

To calculate the APY, it is necessary to have data on the number of publications per year. Then, the years of publication can be summed and divided by the number of publications to obtain the average publication year (Donthu et al., 2021). The co-occurrence analysis conducted in the study used the following formula to calculate the average publication year (APY):

$$APY = \frac{\sum(ti.ni)}{\sum ti}$$

where if a topic t appears in two articles in 2020, three articles in 2021, and five articles in 2022, then its APY value is 2021.3 [(2X2020)+(3X2021)+(5X2022)/10].

The study used VOSviewer for science mapping to better understand research trends, collaborative networks, and thematic clusters. Based on the literature review, the main research gaps in the research on the digitalization of human resource management processes were identified. Reference was made to D.A. Miles's (2017) typology of research gaps: evidence gap, knowledge gap, practical knowledge conflict gap, methodological gap, empirical gap, theoretical gap, and population gap (Miles, 2017).

5. Results of the research

5.1. Performance Analysis

Analysing the results of scientific publication searches identifies current research trends, gaps in the literature, and new developments, which is crucial to conducting innovative research. It facilitates the building of a solid theoretical foundation, monitoring progress in the field, and assessing the quality and impact of existing work. This allows researchers to plan their projects more consciously, avoid duplicating existing research, and develop knowledge more effectively (Ungaro et al., 2024).

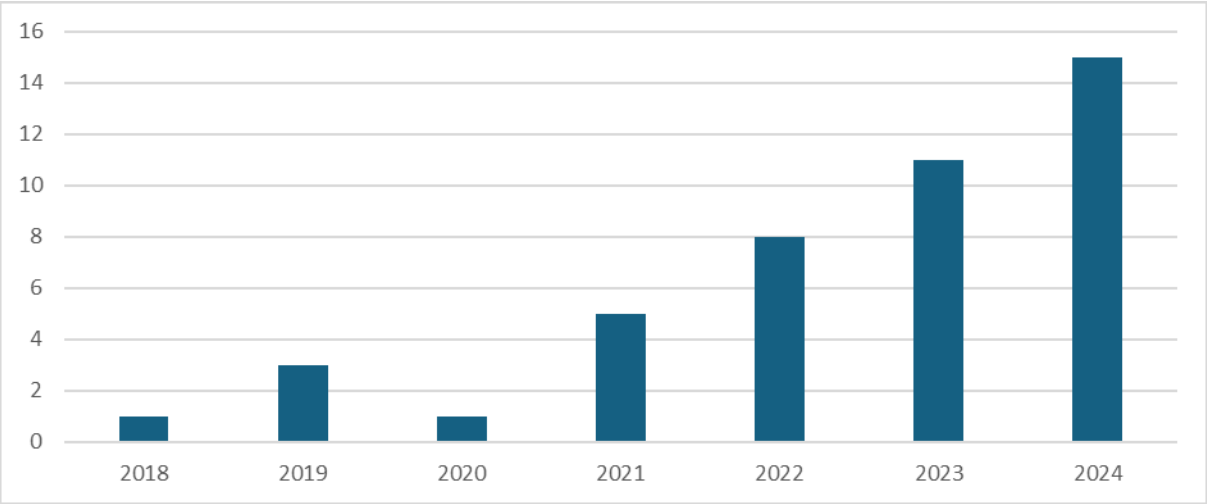

Figure 2. Number of publication between 2018 and 2024.

Source: developed by the authors.

In Figure 2, the upward trend in publications suggests that interest in topics related to the digitisation of human resource management processes is significantly increasing year after year.

Table 1.
Overview of source title

Source title based on number of published articles			
Title	**Documents**	**Total citation**	**Average citation per document**
IEEE Transactions on Engineering Management	3	52	17.3
Sustainability (Switzerland)	3	48	16.0
SA Journal of Human Resource Management	2	11	5.5
International Journal of Human Capital in Urban Management	2	0	0.0
International Journal of Data and Network Science	2	11	5.5
Emerald Emerging Markets Case Studies	2	2	1.0

Source: Author's creation based on Scopus data.

Table 2.
Overview of the source title

Title	**Authors**	**Source**	**Citation**	**Average citation per year**
Organisational effectiveness and agility	Holbeche, L.S.	Journal of Organizational Effectiveness	80	13.33
The role of human resource practices in the implementation of digital transformation	Nicolás-Agustín, Á., Jiménez-Jiménez, D., Maeso-Fernandez, F.	International Journal of Manpower	74	37.00
Ageing workforce effects in Dual-Resource Constrained job-shop scheduling	Berti, N., Finco, S., Battaïa, O., Delorme, X.	International Journal of Production Economics	52	17.33

Cont. table 2.

Sustainability and digitalization of corporate management based on augmented/virtual reality tools usage: China and other world IT companies' experience	Zhao, H., Zhao, Q.H., Ślusarczyk, B.	Sustainability (Switzerland)	46	9.20
Team Formation for Human-Artificial Intelligence Collaboration in the Workplace: A Goal Programming Model to Foster Organizational Change	La Torre, D., Colapinto, C., Durosini, I., Triberti, S.	IEEE Transactions on Engineering Management	31	31.00

Source: Author's creation based on Scopus data.

5.2. Science mapping

Science mapping analysis starts with a co-authorship analysis to explore the interactions among researchers in a specific field, assessed by the number of publications they have co-authored. This analysis investigates the scientific collaborations between researchers and the connections among them, considering their institutional and national affiliations. As co-authorship represents a formal form of intellectual collaboration, understanding how scientists engage with one another is crucial (Donthu et al., 2021).

Table 2 lists the top authors of 44 documents, ranked by the total link strength of their coauthorship among the 133 authors.

Table 3.
Top 5 most collaborative authors

Author name	Document	Citations	Total link strengths
Hagemann Vera	2	14	8
Ruiner Caroline	2	14	8
Hesenius Marc	2	14	8
Klumpp Mathhias	2	14	8
Schaper Martina	2	14	8

Source: Author's creation based on Scopus data.

The co-authorship analysis shows that the collaboration of researchers plays a key role in exploring the topic of digitalisation and HRM, bringing together different perspectives and specialisations. Researchers such as Vedernikov, Bazaliyska, Zelena, Volianska-Savchuk and Boiko focus on the digital transformation of HRM. Krzywdzinski and Jo emphasise the importance of the local context in international knowledge transfer (Krzywdzinski, Jo, 2022). Straková, Talíř and Váchal study digitisation in SMEs (Straková et al., 2022), and Kafel, Wodecka-Hyjek and Kusa in the public sector (Wodecka-Hyjek et al., 2024). Joint work indicates that digitalisation affects HRM effectiveness and employee relations, as evidenced by research on e-recruitment and digital HRM (Aminudin et al., 2024; Vedernikov et al., 2022). The authors contribute to the development of new research methods and concepts to support the understanding and management of digital transformation (Al-Alawi et al., 2023).

5.3. Bibliographic coupling

The study identified three research clusters. This division allows for a better understanding of the thematic scope of each source and their linkages.

Table 4.
Research themes based on bibliographic coupling

Theme	Authors	Title	Total citations
Digital Transformation and Digitalization of HRM	Nicolás-Agustín, Á., Jiménez-Jiménez, D., Maeso-Fernandez, F.	The role of human resource practices in the implementation of digital transformation	74
	Zhao, H., Zhao, Q.H., Ślusarczyk, B.	Sustainability and digitalization of corporate management based on augmented/virtual reality tools usage: China and other world IT companies' experience	46
	Straková, J., Talíř, M., Váchal, J.	Opportunities And Threats of Digital Transformation of Business Models In SMES	27
Impact of technology on HRM	Holbeche, L.S.	Organisational effectiveness and agility	80
	La Torre, D., Colapinto, C., Durosini, I., Triberti, S.	Team Formation for Human-Artificial Intelligence Collaboration in the Workplace: A Goal Programming Model to Foster Organizational Change	32
	Karwehl, L.J., Kauffeld, S.	Traditional and new ways in competence management: Application of HR analytics in competence management	22
Adaptation and innovation	Berti, N., Finco, S., Battaïa, O., Delorme, X.	Ageing workforce effects in Dual-Resource Constrained job-shop scheduling	52
	Al-Alawi, A.I., Messaadia, M., Mehrotra, A., Sanosi, S.K., Elias, H., Althawadi, A.H.	Digital transformation adoption in human resources management during COVID-19	21
	Dang-Pham, D., Hoang, A.-P., Vo, D.-T., Kautz, K.	Digital Kaizen: An Approach to Digital Transformation	16

Source: Author's creation based on Scopus data.

The first thematic cluster (12 articles) emphasises that successful digital transformation requires not only investment in technology but, above all, strategic human resource management, promoting innovative employee behaviour and adapting HRM practices to the requirements of the digital age (Nicolás-Agustín et al., 2021). The use of digital technologies in business management has many benefits, such as improving efficiency, optimising processes and increasing employee engagement. These innovative tools also support sustainability by reducing emissions and optimising resources, changing the way companies operate and offering new opportunities in different areas (Zhao et al., 2019). The digital transformation of business models in SMEs is an inevitable process that presents many opportunities to increase efficiency and competitiveness, but also brings risks, such as imbalances in the digitisation of processes and the need for investment. Adequate preparation, digital strategy and flexibility are key to success, allowing SMEs to exploit the potential of digitisation and achieve sustainable growth (Straková et al., 2022).

The Second thematic cluster (12 articles) discusses the impact of technology on all hrm processes. Research indicates that undervaluing human resource management (HRM) in the manufacturing and service sectors negatively affects the profitability of companies, while the digitisation of HRM brings significant benefits, increasing the efficiency and competitiveness of companies (Straková et al., 2022). The purpose-driven programming model supports this process by optimising the collaboration of teams with AI and minimising resistance to new technologies, thus fostering innovation (La Torre et al., 2023). Shifting from traditional competency models to analytical approaches allows organisations to manage human resources more effectively, develop employee competencies and build competitive advantage based on the strategic use of data (Karwehl, Kauffeld, 2021).

The third thematic cluster (18 articles) emphasises that the digitisation of HRM is not only about the implementation of new technologies, but also about changing approaches to competence management and employee development. The digitisation of HRM requires a shift from traditional competency models to HR analytics-based approaches, allowing organisations to manage human resources more effectively and develop employee competencies through data analytics (Berti et al., 2021). The COVID-19 pandemic accelerated this process, requiring investment in IT, digital skills development and overcoming employee resistance to successfully implement the transformation (Al-Alawi et al., 2023). Digital Kaizen, combining continuous improvement with technology, enables incremental improvements in HR processes, increasing efficiency and supporting business transformation (Dang-Pham et al., 2022).

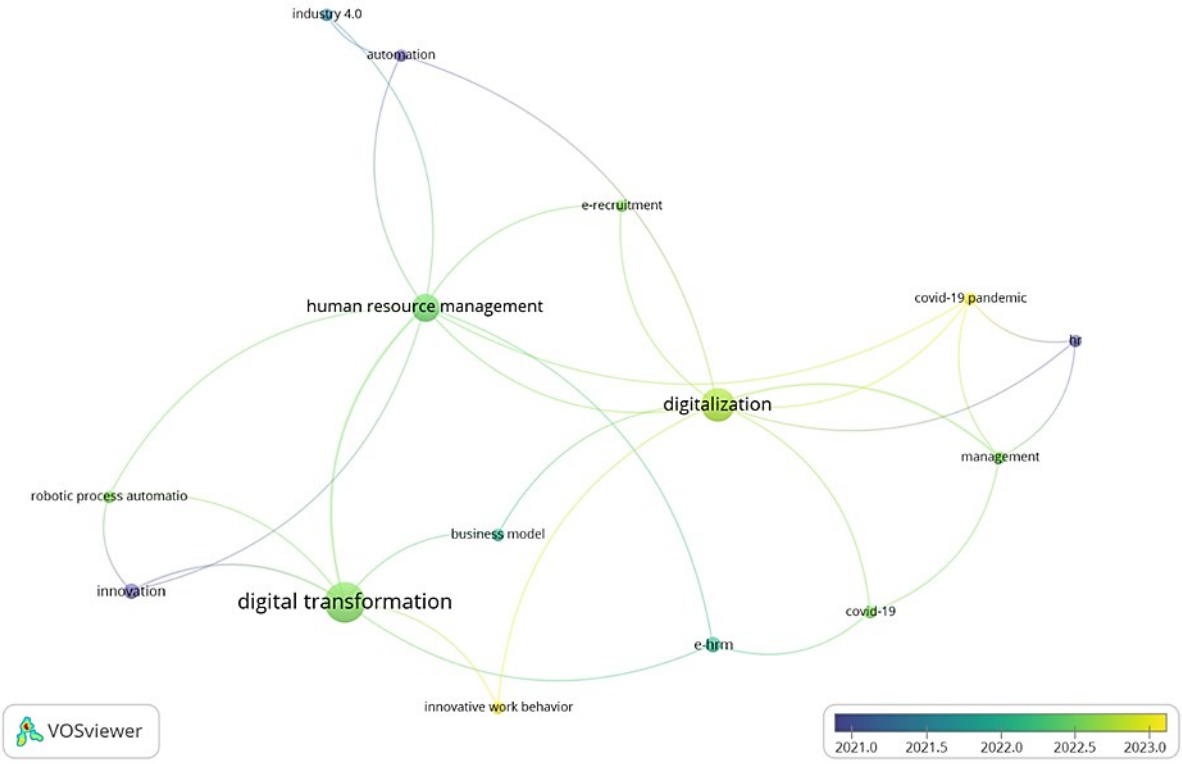

Figure 3. Author keyword co-occurrence.

Source: Author's creation based on Scopus data.

This figure presents the themes (topics) alongside their average publication year (APY), which serves as a marker for identifying trends within these topics. The chart shows a map of thematic clusters generated in VOSviewer based on a co-occurrence analysis of terms (e.g. keywords) related to the topics of digitalisation, digital transformation and HRM. The analysis of the sources shows the evolution of approaches to human resource management (HRM) in the context of digitalisation and digital transformation. Initial publications focused on theoretical aspects and first implementations of e-HRM, as well as on employee competences (Karwehl and Kauffeld, 2021).). Over time, especially after 2020, the pandemic accelerated digitisation, forcing the development of e-recruitment and remote management (Vedernikov et al., 2022). In the 2022-2024 publications, an emphasis on the practical aspects of digital transformation is evident (Erro-Garcés, Aramendia-Muneta, 2023; Nematollahi et al., 2024), evaluating the effectiveness of implemented changes and developing digital competences. HRM has evolved from a support function to a strategic business partner (Karwehl, Kauffeld, 2021), crucial to achieving the organisation's goals in the digital age. Sources highlight the strong interdependencies between HRM, digitalisation and digital transformation. HR analytics, used to optimise processes and make data-driven decisions, is becoming increasingly important. Additionally, publications address new challenges such as the ethics of data use and cyber security. In the context of digital transformation, business models are changing (Mazhar, Al-Shawabkeh, 2022). The research focuses on the impact of technology on HR processes, strategic changes in organisations and the long-term implications of these changes. The chart shows that research on the digitalisation of HR processes shows an increasing trend over time, which is in line with the results analysis and indicates a similar upward trend.

6. Discussion

The evidence gap indicates that there is a lack of evidence on the impact of digital HRM on business performance, with studies overlooking implementation and the full process from rejection to technology adoption (Brommeyer et al., 2024; Jierasup, Leelasantitham, 2024; Karwehl, Kauffeld, 2021; Saifudin et al., 2021). The knowledge gap, on the other hand, underscores the need for in-depth research on the impact of leaders' complementary skills, knowledge management in the context of digital transformation, HR analytics, and e-recruitment (Habachi et al., 2022). The practical knowledge conflict gap indicates that articles point out the limitations of competency models in the context of dynamic change and remote work, highlighting the lack of consensus on their impact on effectiveness in a changing environment (Habachi et al., 2022; Nicolás-Agustín et al., 2021; Zhao et al., 2024). The methodological gap in the digitization of HRM includes the lack of standardized methods

for measuring performance, assessing the impact on employee experience, analyzing complex data, and validating models under varying conditions, making it difficult to obtain reliable results (Habachi et al., 2022; Mazhar, Al-Shawabkeh, 2022). The empirical gap in the digitization of HRM refers to the paucity of studies based on real data, analyzing the impact of technology on different groups of employees and in the context of remote and hybrid models, especially in SMEs and different sectors (Ergasheva et al., 2024; Straková et al., 2022; Wodecka-Hyjek et al., 2024). The theoretical gap in the digitalization of HRM is due to the lack of consistent definitions, links to management theories, consideration of organizational context, conceptualization of employee impact, and theories that explain the dynamics of change (Ergasheva et al., 2024; Wodecka-Hyjek et al., 2024).

Future research on HR digitization should focus on several key aspects to support the development of this field. It is important to understand the impact of technologies such as artificial intelligence (AI), machine learning and process automation on recruitment, onboarding, career development, administration and performance management. It is also worth exploring how these technologies can reduce the burden on HR departments and increase their ability to accomplish strategic tasks. An important area is to analyze the use of Big Data and HR analytics in decision-making, forecasting trends, identifying talent and improving employee engagement.

Another direction of research should be the personalization of HR processes, taking into account the impact of technology on employee satisfaction and well-being, as well as risks such as job burnout and work-life imbalance. It is also important to study the impact of digitization on organizational culture, fostering organizational values and managing change in the context of digital transformation. It is also necessary to develop HR digitization performance indicators and conduct cost-benefit analyses of the implementation of new technologies, taking into account their impact on productivity, costs and the achievement of strategic organizational goals.

The ethical and social aspects of HR digitization require special attention. Research should focus on protecting employee data privacy, countering discrimination, and promoting diversity and inclusion in the workplace. It is equally important to understand the impact of digitization on the labor market, including changes in demand for competencies, automation of occupations and creation of new employment opportunities. Future research must provide solutions that promote efficiency, ethics and inclusion in human resource management, taking into account both the organization's and employees' perspectives.

In summary, future research directions should focus on advanced technologies, the employee experience, the effectiveness of digitization, as well as ethical and social aspects. Research in these areas will provide a better understanding of the potential of HR digitization and maximize the benefits for organizations and employees.

7. Conclusions

The research conducted in this study emphasizes the key connections between the digitization of HR processes and the fundamental theories and practices of management, identifying important trends, influential publications, and emerging research gaps. The analysis of the results obtained allowed the researchers to answer the research questions posed in the study. Regarding the first research question, three key thematic clusters were identified. The first is related to the strategic integration of digital technologies in human resource management. The second concerns the impact on HRM processes, while the third is related to the adaptation of competencies in response to technological changes. Regarding the second research question, numerous research gaps were identified, including the lack of evidence on the impact of HRM digitization on company business performance; the need to deepen leaders' skills in digital transformation; the standardization of methods for measuring HRM digitization; the impact of technology on various employee groups; and the lack of common definitions linking digitization with HRM. The answers to the third research question indicate that the greatest interest in the subject of HR process digitization is focused on issues such as the evolution of approaches to HRM in the context of digital transformation, its practical aspects, and the optimization of HRM based on digitization. An important issue considered in this context is also the ethics of HRM digitization and cybersecurity.

Through a comprehensive bibliometric analysis, the study not only reflects the current state of knowledge in HR digitization but also provides valuable insights for future research on modern and sustainable HR management practices. This work lays the foundation for deepening both the theoretical understanding of HR digitization and its practical applications, inspiring future innovations in the area of sustainable and effective HR process management.

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