



Database System Integration for Employee Performance Enhancement and Organizational Culture: VOSViewer Bibliometric Analysis

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ABSTRACT

This study aims to map and analyze the development of research related to database systems in supporting performance management and organizational culture using a bibliometric approach. The data were obtained from the Scopus database, consisting of 52 articles, and analyzed using VOSviewer software. The results show a trend of increasing publications from 2002 to 2025. The most influential author was identified through the article by Cavanagh et al. (2021), which received 77 citations. The thematic mapping reveals five main clusters, with the red cluster dominating with 12 articles. This study also finds a topical evolution from technical aspects to strategic applications in organizations, providing important insights for developing more effective database systems to enhance performance management and organizational culture.

INTRODUCTION

In the era of increasingly rapid digital transformation, organizations are required to be able to manage information efficiently and strategically to increase competitiveness and work productivity. One of the aspects that is the main focus in the management of modern organizations is the management of human resources (HR), which can no longer be separated from the use of information technology, especially integrated database systems. In this context, employee database management systems play a vital role as a supporting infrastructure in the collection, storage, processing, and presentation of complex, dynamic, and strategic employee data. According to Laudon and Laudon (2018), information management systems, including HR databases, function not only as an administrative tool, but also as a tool that supports data-driven managerial decision-making in real-time, thus becoming an important foundation in shaping adaptive and knowledge-based organizational structures.

Furthermore, Fitz-enz (2000), as a pioneer in measuring the effectiveness of human resources, stated that database systems are the main measurement tool in managing workforce performance because of their ability to connect historical and predictive data to support organizational strategic planning. Not only does this kind of system support operational efficiency through the automation of administrative processes such as payroll, attendance, and training, but it also allows organizations to monitor employee performance, identify potential HR risks, and design talent development strategies in a more measurable and accountable manner.

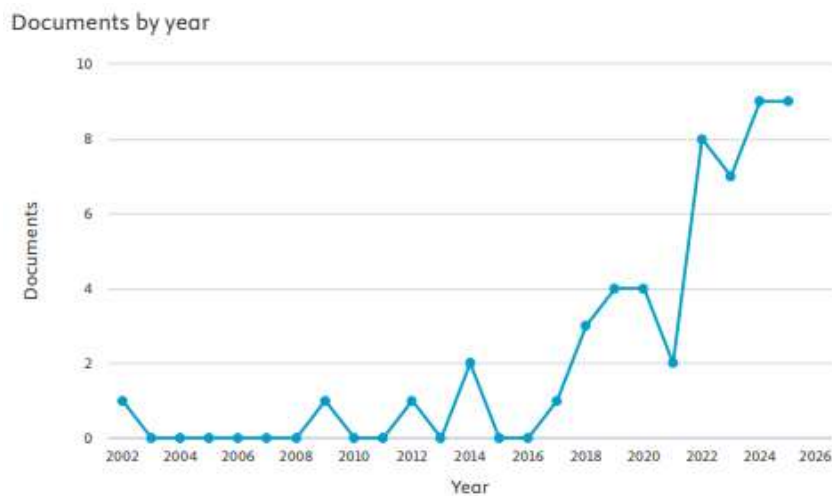


Figure 1. Graph of Number of Publications per Year

In line with that, a bibliometric approach to the scientific literature over the past 23 years reveals that themes such as "human resource management", "performance management", and "digital transformation" dominate the scientific discourse, suggesting that HR database systems have taken center stage in the development of contemporary management theory and practice. The years 2024 and 2025 are the pinnacle of improvement with 9 publications each, showing a surge in interest in the topic of database systems and HRM in the last two years.

Research by Khan (2022) shows that the implementation of a web-based database system is able to increase the effectiveness of the recruitment and

selection process of employees through the integration of real-time data and artificial intelligence algorithms. Soetjipto et al. (2021) prove that the use of integrated databases in HR management has a significant effect on supply chain excellence and organizational performance. Shahzad et al. (2021) through bibliometric analysis highlight the importance of knowledge and data management in improving human resource management systems.

Departing from this urgency, this study aims to answer three main questions as the basis for analysis:

1. What are the trends of publications and research citations on database systems in the context of performance management and organizational culture?
2. Who are the main authors and journals who contribute to this field?
3. How have topics and patterns of collaboration evolved in database systems research, performance management, and organizational culture?

To answer these questions, this study uses a bibliometric approach, which is a quantitative method that analyzes the metadata of scientific publications to map trends, author contributions, thematic relationships, and collaboration structures in a particular field of study. Data was obtained from the Scopus database, covering the period 2002 to 2025, which was then visually analyzed using VOSviewer software. This approach allows researchers to not only identify influential publications and authors, but also uncover evolving conceptual networks as well as relate them to the design of HR database management information systems that are relevant to the practical needs of modern organizations. Thus, this research is expected to contribute to bridging theoretical studies with information system design based on real needs and technological developments.

LITERATURE REVIEW

Database Management System (DBMS)

DBMS is software designed to efficiently manage, store, and retrieve data. Elmasri & Navathe (2015) emphasized that DBMS allows organizations to manage data in a structured and integrated manner, supporting data-driven decision-making. Khan's research (2022) shows that web- and cloud-based DBMS can improve the accuracy and efficiency of HR management processes. A database management system (DBMS) is a software system used to create and manage data from a database. A gap in the literature related to database management systems in a study conducted by Alharthi et al. (2021) in the *Journal of Information Systems* states that many DBMS systems still fail to be implemented because they do not consider the scope of the organization and user behavior.

Human Resource Management (HRM)

HRM is a set of policies and practices to manage people as the main asset of the organization (Armstrong, 2014). Soetjipto et al. (2021) found that database integration in HRM speeds up administrative processes and improves the reliability of employee data. Shahzad et al. (2021) emphasized that database-

based knowledge management is essential to support innovation and human resource development. Alias et al. (2023) also highlight the importance of talent management supported by accurate and integrated data. Human resource management can be defined as a strategic and comprehensive approach to managing employees and the work environment in a company. However, research by Marler & Boudreau (2017) at the Academy of Management Perspective, states that the adoption of technology in HRM is not always directly proportional to the improvement of strategic performance of human resources if it is not supported by changes in work culture.

Organizational Culture

Schein (2010) views organizational culture as a value system that shapes the behavior of organizational members. Denison (1990) added that transparent access to information through DBMS can strengthen collaborative culture. Piwowar-Sulej & Purgat-Popiela (2022) show that an effective database encourages collective creativity and innovation, while Purgat-Popiela (2020) highlights the influence of organizational culture on the successful implementation of sustainable strategies. Organizational culture can be defined as the values that are the basis and guidelines that members behave in an organization. However, Leidner & Kayworth (2006), MIS Quarterly, show that mismatches between information systems and organizational cultural values can decrease the effectiveness of technology implementation.

Employee Performance Management

Performance management is the process of ensuring performance that is integrated with a database to ensure the alignment of individual and organizational goals (Aguinis, 2013). DBMS provides real-time performance evaluation data, supporting employee feedback and development (Pulakos, 2009). Research by Van Der Borgh & Schepers (2014) shows that database-based performance data increases the effectiveness of employee performance management. Employee performance management is a systematic process that DBMS integrates aims to improve the performance of individuals and organizations as a whole, efficiently and structured.

METHODOLOGY

This research was conducted with a bibliometric approach, which is an analysis method used to evaluate, map, and visualize scientific literature based on publication metadata. This approach was chosen because it is able to provide a comprehensive overview of the development of knowledge, research trends, collaboration between authors, and themes that develop in a certain scientific field. In this study, the publication data used was obtained from the Scopus database, covering the time span from 2002 to 2025, which is one of the leading scientific databases and widely used in bibliometric studies. The process includes:

1. Data Collection

The initial stage of this analysis process is the collection and extraction of publication data from the Scopus database. Scopus is known for its extensive database, including journals, conferences, and other scientific sources, which allows researchers to get a comprehensive overview of current and relevant research in the field being studied. The metadata of the collected publications includes the title of the article, the author's name, affiliation, abstract, keywords, journal source, and year of publication. Data search was conducted using key keywords such as "database", "human resource management", and "employee performance", which were chosen because they were directly related to the research focus in the field of human resource management and employee performance. In addition, screening criteria are also applied so that only journal articles are included in the subject category "Business, Management, and Accounting" and are in English. With these criteria, it is expected that the published analysis is really relevant to the topic being discussed and has high academic quality. At this stage, 52 publications were obtained. Then the process of saving search results, search results are stored in CSV and RIS formats to facilitate further data analysis.

2. Bibliometric Analysis

The next stage is to perform a bibliometric analysis with the help of the VOSviewer software. The app is used for its ability to build and visualize complex bibliometric networks. The resulting visualization includes a network of collaboration between authors (co-authorship), relationships between keywords (co-occurrence of keywords), and relationships between publication or journal sources (co-citation). This bibliometric approach not only makes it possible to identify the most significant scientific contributions in a particular topic, but also to map the structure and dynamics of science over time. In this context, references from Donthu et al. (2021) and Van Eck and Waltman (2010) are used as a theoretical basis in applying this method.

3. Author and Journal Identification

One of the main focuses of this analysis is to identify the authors and journals that are most productive and have made a major contribution to the development of research in the topic under study. Through bibliometric analysis, the authors with the highest number of publications and the journals that are the most frequent sources of related publications can be identified. This information is important to know the centers of knowledge production as well as key literature that can be used as a reference in further research.

4. Thematic Analysis

In addition to identifying authors and journals, thematic analysis was also carried out to reveal the main themes that developed in the research regarding databases, human resource management, and employee performance. This analysis includes the identification of frequently occurring keywords, the relationships between topics, and how these

themes have evolved over the past 15 years. Thus, this study not only provides a bibliometric mapping, but also offers a deeper understanding of the content and direction of scientific development in the topic studied.

RESULTS

Publication and Citation Trends

From the visualized bibliometric results, it can be seen that the topic of human resource management is the main center of attention in the scientific literature. This is reflected in the very large size of the "human resource management" nodes, indicating that the frequency of their occurrence is very high in the published analyses. This increase in publication trends is also followed by an increasing number of new keywords that appear and are interconnected, such as "digital transformation", "artificial intelligence", and "sustainability". This phenomenon shows that research on database systems and performance management as well as organizational culture is growing, both in terms of the number of publications and the number of citations. This is in line with the development of organizational needs for integrated data and information technology-based human resource management. The number of publications has increased significantly since 2018, with a peak in 2024–2025. The highest citations were obtained articles that discuss database integration with HR management and new technologies such as AI, machine learning (Shahzad et al., 2021; Khan, 2022). Austen & Piwowar-Sulej (2024) added that the topic of green HRM and sustainability is also increasingly researched, in line with the demands of organizations to adapt to environmental issues.

Table 1. List of Publication Trends and Citations

No	Lead Author	Article Title	Year	Number of Citations	Main Sources (Journals/Institutions)
1	Cavanagh J., et al.	Supporting workers with disabilities: a scoping review of the role of human resource management in contemporary organisations	2017	77	Asia Pacific Journal of Human Resources
2	Van Der Borgh M., Schepers J.J.L.	Do Retailers Really Profit from Ambidextrous Managers? The Impact of Frontline Mechanisms on New and Existing	2014	31	Journal of Product Innovation Management

		Product Selling Performance			
3	Shahzad I.A., et al.	Human systems management: A retrospective of 40 years	2021	19	Human Systems Management
4	Khan S.	An Efficient Human Resource Management System Model Using Web-Based Hybrid Technique	2022	5	Problems and Perspectives in Management
5	Soetjipto N., et al.	Implementation of enterprise human resources management standards to achieve supply chain excellence in fertilizer companies in Indonesia.	2021	3	Uncertain Supply Chain Management

Top Authors and Source Impact

The large and dense nodes around "human resource management" indicate the presence of highly influential authors and primary sources in this field. Authors such as Piwowar-Sulej, K., Purgał-Popiela, J., and Shahzad, I.A. are known to appear frequently in major publications on HRM and database systems. The main sources or journals that are often referenced are journals that focus on HRM, information management, and organizational innovation, such as Human Systems Management and the Asia Pacific Journal of Human Resources (Cavanagh et al., 2017; Shahzad et al., 2021). Their contribution is significant in shaping the direction and quality of research in this field, as well as being an important reference for other researchers.

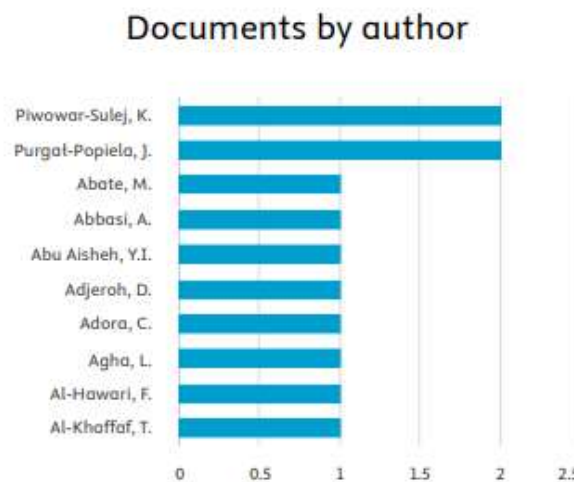
Table 2. List of Influential Authors and Affiliates

Author Name	Number of Publications	Main Sources (Affiliates)
Bierbräu-Sule, K.	2	Krakov University of Economics
Purgał-Popiela, J.	2	Cracow University of Economics

Most Influential Authors

From the network that has formed, it can be seen that some writers have a great influence because they are often the center of the connection between keywords and themes. These authors usually produce many publications and are often cited by other researchers. They have been pioneering in developing the concept of integrating database systems with performance management and organizational culture, as well as encouraging the emergence of new topics such as "knowledge management" and "digital transformation". Piwowar-Sulej, K. and Shahzad, I.A. are the authors with the highest number of publications on this topic, demonstrating the expertise and consistency of research in the field of DBMS and HRM.

Figure 2. Publication graph by author



Most Relevant Sources

The most relevant journals are indicated by the density of connections and the appearance of keywords directly related to the main theme. Journals such as Human Systems Management, Problems and Perspectives in Management, and Asia Pacific Journal of Human Resources are the main sources for research publications in this field. These journals provide a space for researchers to examine innovations in HRM, database systems, and organizational transformation, as well as being a major source for theoretical and practical developments in this field.

Table 3. Most Relevant Journals

No	Journal Name	Number of Documents	Document Type
1	Asia Pacific Journal of Human Resources	1	Article
2	Journal of Product Innovation Management	1	Article
3	Human Systems Management	1	Article

4	Problems and Perspectives in Management	1	Article
5	Uncertain Supply Chain Management	1	Article
6	Engineering Management in Production and Services	1	Article

Keyword Analysis and Thematic Mapping

1. Main Keywords: "human resource management", "database", "employee performance", "motivation", "innovation".
2. The most popular topics: database integration in HRM, the use of AI for recruitment, data-driven performance assessment.

The main topics that emerged include "performance management", "sustainability", "digital transformation", "knowledge management", and "organizational culture". This analysis shows that research in this area is not only focused on the technical aspects of database systems, but also on their application in improving overall organizational performance and culture.

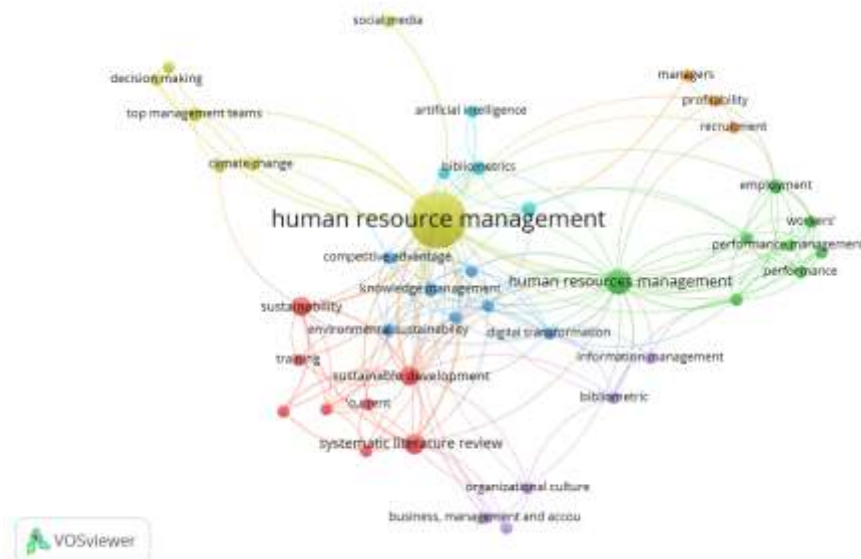


Figure 3. VOSviewer Networking Visualization Results

The image produced from VOSviewer is a co-word analysis visualization of research related to database systems, performance management, and organizational culture, with a main focus on the field of Human Resource Management (HRM). The keyword "human resource management" becomes the center (largest node) of the network, indicating that this theme is the most dominant topic and often takes center stage in the research analyzed. This is in line with Armstrong's (2014) theory which states that HRM is the core of modern organizational management, where database systems are the backbone of employee data management, performance evaluation, and organizational culture development. This visualization divides keywords into several different color clusters, each of which represents a group of themes/topics that often appear together in the literature:

1. **Green Cluster: Performance and Employee Management**
With the keywords performance management, performance, workers', employment, recruitment, profitability, managers. This cluster highlights the close relationship between HRM, performance management, and the recruitment process. Database systems play an important role in providing real-time data for performance evaluation and supporting decision-making related to workforce management (Pulakos, 2009). Research categorized as this cluster includes Supporting workers with disabilities: a scoping review of the role of human resource management in contemporary organisations by Cavanagh, J., Bartram, T., Meacham, H., Bigby, C., Oakman, J., Fossey, E. (2017), *Asia Pacific Journal of Human Resources*. Focus on HRM's role in supporting workers with disabilities and inclusive workforce management. In addition, authors Khan, S. (2022) conducted research on An Efficient Human Resource Management System Model Using Web-Based Hybrid Technique, *Problems and Perspectives in Management*, developing a web-based HRM model to improve the efficiency of recruitment and candidate assessment.
2. **Red Cluster: Sustainability and Organizational Development**
Keywords include sustainability, environmental sustainability, sustainable development, training, systematic literature review. This theme signifies a research trend that links HRM to sustainable development goals and training, where databases are used to monitor and manage organizational sustainability initiatives (Soetjipto et al., 2021). The research categorized in this list includes an article written by Soetjipto, et al (2021) entitled Implementation of enterprise human resources management standards to achieve supply chain excellence in fertilizer companies in Indonesia, *Uncertain Supply Chain Management*, analyzing the role of HRM in supporting sustainability and supply chain excellence. In addition, Collective creativity in management science *Engineering Management in Production and Services* by Ciachorowski, D., Lis, A. M. (2022). A systematic review of collective creativity and its influence on organizational innovation.
3. **The Yellow Cluster: Decision Making and Leadership**
Keywords such as decision making, top management teams, climate change. This cluster highlights the importance of data in strategic decision-making by organizational leaders, reinforcing the arguments of Laudon & Laudon (2016) about the role of DBMS in supporting data-driven decisions. Research conducted by Shahzad, I. A., Farrukh, M., Wu, Y., Trunk, N. (2021), *Human systems management: A retrospective of 40 years*, *Human Systems Management* is included in this cluster, which analyzes bibliometrics on the evolution of human systems management, including decision-making and the role of top management teams.
4. **Blue Cluster: Digital Transformation and Innovation**
With keywords artificial intelligence, digital transformation, knowledge management, competitive advantage, bibliometrics. This cluster shows the linkage between HRM, digital transformation, and the use of new

technologies such as AI and databases for competitive advantage and knowledge management (Khan, 2022). Research that falls into this cluster is Human systems management: A retrospective of 40 years, Human Systems Management by Shahzad, I. A., Farrukh, M., Wu, Y., Trunk, N. (2021). The article is also included in this cluster because it discusses bibliometrics, knowledge management, and information systems.

5. Purple Cluster: Organizational Culture and Information Management

The keywords in this list are organizational culture, information management, bibliometric, business, management and account. This cluster strengthens the role of databases in building an adaptive and collaborative organizational culture (Schein, 2010; Denison, 1990). An example of an article on this cluster was written by Ciachorowski D.; Lis A.M. (2022), entitled Engineering Management in Production and Services. This article is a systematic literature review of collective creativity in management science, including a discussion of the role of organizational culture and information management in driving innovation and team effectiveness.

Inter-Cluster Linkages

The links between the nodes indicate that the themes intersect. In the image, the green cluster containing keywords such as "performance management", "employment", and "recruitment" is very closely related to the blue cluster containing "knowledge management", "digital transformation", and "competitive advantage". This shows the integration between performance management, digital transformation, and organizational competitive advantage. Meanwhile, the red cluster containing "sustainability", "training", and "systematic literature review" indicates the importance of sustainable development in HRM. This interconnectedness reinforces the argument that database systems do not stand alone, but rather are integrated with various aspects of organizational management.

Table 4. Topic Evolution
Topic Evolution (Conceptual Structure and Co-Word Dynamics)

Period	Dominant Keywords	Related Keywords (Co-Word)
2017-2019	Human Resource Management	Disability, Inclusion, Diversity, Database
2020-2021	Knowledge Management, Bibliometrics	System, Information Analysis, Co-citation
2021-2022	Innovation, Recruitment, Database	Web-based, CNN-LSTM, Candidate Performance
2021-2022	Supply Chain, Enterprise Standards	Productivity, Logistics, Operational Effectiveness
2022	Collective Creativity, Teamwork	Systematic Review, Creativity, Management Science
2023-2025	AI, Machine Learning, Data Analytics	HR Digitalization, Strategic Workforce Planning

The evolution of the topic is very clear from the emergence of new keywords that are increasingly relevant to technological developments and the needs of modern organizations. Initially, the research may have focused more on the technical aspects of HRM and databases, but it has now evolved towards "digital transformation", "artificial intelligence", and "sustainability". Malik et al. (2025) and Lawrence & Poliquin (2023) show the evolution of topics from technical aspects to strategic applications, as well as increased international collaboration in database systems research, HRM, and organizational culture. Zolak Poljašević et al. (2025) highlight the importance of adapting organizational culture in the context of ever-changing public administration. These dynamics show that research in this field is increasingly adaptive to changes in the business and technological environment, and increasingly emphasizes the importance of innovation and sustainability in organizational management.

Author Collaboration

Many articles are written by multidisciplinary teams from various institutions. The interconnected network of keywords also reflects the collaboration between writers from various institutions and countries. This collaboration is essential to enrich perspectives and accelerate innovation in research. Authors at the center of the network typically have an extensive network of collaborations, allowing for a more comprehensive exchange of ideas and research development. This collaboration also strengthens the quality and impact of the research produced.

Global Collaboration Between Countries

This image also shows the existence of global collaboration between countries, as seen from the diversity of topics and the relevance of international keywords. Countries such as the United States, Australia, Poland, and China are often centers of research and collaboration in this field. This global collaboration enriches research with innovative approaches and solutions, and accelerates the adoption of the latest technologies in HRM and database systems in different parts of the world.

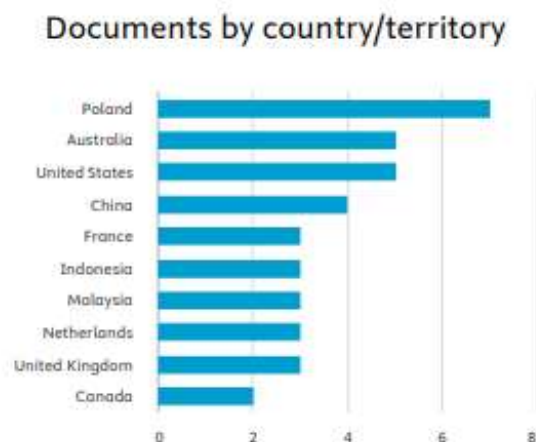


Figure 4. Publication graph by country

Trending Topics Content Analysis

The latest article trends can be seen from the emergence of keywords such as "artificial intelligence", "digital transformation", and "sustainability". This shows that the trending topics are those that associate HRM and database systems with advanced technology and sustainability issues. Recent research has extensively discussed the integration of AI in HRM, the use of databases to support organizational digital transformation, and the role of data in supporting sustainable development goals. These topics are highly relevant to the needs of today's organizations that must constantly adapt to changing technologies and the global business environment. Recent articles highlight the importance of database integration with artificial intelligence technologies, cloud computing, and mobile applications to improve HRM efficiency and build an innovative organizational culture (Khan, 2022).

DISCUSSION

The results of the bibliometric analysis presented in this study show a significant development in the number of publications and research topics related to the use of database systems in employee performance management and strengthening organizational culture. Through the bibliometric approach carried out to Scopus publications during the period 2009 to 2024, bibliometric visualizations generated through the VOSviewer software show that the keyword "human resource management" is in the central node in the network, which indicates its highest frequency of occurrence as well as its position as a link between other themes that appear in related scientific publications. These findings show that the focus of scientific studies is not only limited to the technical aspects of information systems, but has transformed into a more strategic discourse, namely how database systems can support overall organizational goals, especially in improving employee performance and forming an adaptive, collaborative, and sustainability-oriented work culture.

Kecenderungan tersebut secara langsung berkaitan dengan rancangan sistem informasi manajemen database karyawan sebagaimana dijelaskan dalam dokumen pendukung, yang menekankan pentingnya pembangunan sistem database SDM yang mampu mengelola data secara terintegrasi, akurat, dan real-time, serta mendukung proses-proses strategis organisasi, mulai dari rekrutmen, penggajian, hingga evaluasi kinerja dan pengembangan talenta. Sistem yang dirancang mencakup komponen utama berupa perangkat lunak (DBMS dan HRIS), perangkat keras (server, jaringan, komputer), pengguna (HR, manajer, administrator), data karyawan (absensi, pelatihan, gaji, evaluasi), serta kebijakan dan prosedur yang mengatur pengumpulan, pemrosesan, dan pengamanan data. Hubungan antara komponen-komponen ini dikonstruksikan dalam suatu struktur yang terorganisir, dengan jalur komunikasi, koordinasi, dan instruksi yang jelas, sehingga menciptakan sistem yang tidak hanya efisien, tetapi juga efektif dalam mendukung pengambilan keputusan manajerial.

Meanwhile, from the results of thematic analysis in the bibliometric study, it was found that themes such as "performance management", "digital transformation", "knowledge management", "artificial intelligence", and

"sustainability" emerged as dominant topics that developed rapidly in the literature. These findings reinforce the argument that employee database systems are not just an administrative tool, but part of an organization's strategy to digitally transform, strengthen competitiveness, and integrate the latest technologies such as AI and machine learning to support data-driven decision-making processes. In this context, information system designs developed with analytics dashboard features, cloud integration, mobile access, and adaptability to new policies are very relevant because they not only answer technical needs, but also provide a foundation for the sustainable development of data-based HR strategies.

The collaboration between authors from different countries that appear in the bibliometric network reflects the global need for a uniform, flexible, and compliant HR management system across countries, such as personal data protection (GDPR), information security standards (ISO 27001), and digital-based Human Capital Management practices. This requires organizations to build HR information systems that have role-based access control, audit trails, and ongoing evaluation and maintenance mechanisms, as shown in the system design document. With these features, organizations can ensure that the database system built is able to provide accurate information, maintain data integrity, and increase transparency and accountability in human resource management.

Thus, this discussion underscores that there is a close relationship between the conceptual findings of bibliometric studies and the practical design of employee database information systems, both of which reinforce each other and show that the development of data-based information systems is not just an option, but a strategic need of modern organizations. The use of database systems, which are designed with efficiency, effectiveness, sustainability, and flexibility of adaptation to changing business environments, have proven to be an important foundation in creating a responsive, highly competitive, and ready organization to face the challenges of digital transformation and technological disruption in the future.

CONCLUSION

This study provides a comprehensive mapping of trends, contributions, and theme dynamics in the study of database systems in the context of performance management and organizational culture. Based on a bibliometric analysis of 52 articles in the period 2002 to 2025, it was found that there was a sharp increase in the number of publications and an expansion of the scope of the topics discussed. The research also identifies key figures and influential journals that form the scientific foundation in this field, as well as reveals the transformation of the topic from technical aspects to organizational strategies and the increasing cross-border collaboration.

Publication Trends and Citations

The number of publications increased significantly, from just 1 article in 2002 to 9 articles in 2024 and 2025, showing a surge of 800%, an increase in the number of citations was also seen from articles discussing database integration with new technologies, such as AI and machine learning. The article with the

highest citations is by Cavanagh et al. (2017) with 77 citations, showing a strong influence in the discourse of database systems and HRM, with the dominant topics in the current trend including "human resource management", "digital transformation", "artificial intelligence", and "sustainability".

Authors and Lead Journals

- a. The most prolific and influential authors in this field are Piwowar-Sulej, K. and Purgał-Popiela, J., each with 2 publications.
- b. Journals that are the main references include:
 - 1) Asia Pacific Journal of Human Resources
 - 2) Human Systems Management
 - 3) Problems and Perspectives in Management
 - 4) Journal of Product Innovation Management
 - 5) Uncertain Supply Chain Management
- c. The authors and the journal played a key role in developing conceptual and practical frameworks in the field of database systems and organizational performance management.

Evolution of Topics and Collaboration Patterns

The evolution of the research theme shows a shift from technical topics such as "database design" to strategic applications such as "AI for HRM", "green HRM", and "strategic workforce planning".

There are five main thematic clusters:

1. **Green:** human resources management, performance management, workers, employment
2. **Red:** sustainability, training, systematic literature review
3. **Blue:** competitive advantage, digital transformation, artificial intelligence
4. **Yellow:** decision making, top management teams, climate change
5. **Purple:** bibliometric, organizational culture, information management

International collaboration is increasing, with the involvement of researchers from the United States, Australia, Poland, and China. Many articles were written by cross-border multidisciplinary teams that reinforced the global impact of this study.

FURTHER STUDY

Based on the results of bibliometric analysis and visualization, here are five main directions for future research, including

Integration of Artificial Intelligence in HRM

Future research is suggested to explore more systematically how the integration of AI into HRM database systems can improve the efficiency, accuracy, and personalization of career-development and data-driven HR decision-making, Shahzad et al. (2022) and Khan (2022) highlight the great potential of AI in the automation of HRM processes, from recruitment to talent development. AI can help organizations identify performance patterns, predict

training needs, and provide data-driven recommendations for employee career development.

Knowledge Management and Digital Transformation

The topic of knowledge management and digital transformation is increasingly important, especially in supporting innovation and organizational competitive advantage. It is necessary to develop research that designs a synergy model between management databases, digital technologies, and organizational learning platforms to strengthen innovation and organizational resilience in the face of change. Future research can focus on developing integration models between database systems, knowledge sharing platforms, and digital applications to strengthen organizational culture based on learning and innovation. Lawrence & Poliquin (2023) highlight the role of databases in managing knowledge and supporting the growth of adaptive organizational hierarchies.

Organizational Sustainability and Green HRM

The issue of sustainability and environmental sustainability is the main concern. Future research needs to develop a database system that is able to comprehensively track and evaluate organizational sustainability indicators to support sustainable HR practices and be responsive to environmental regulations. Banga & Gobind (2025) added that the integration of databases with sustainability indicators helps organizations meet regulatory and social responsibility demands.

Data-Driven Decision-Making for Top Management

Shepherd et al. (2020) and Abbasi et al. (2019) show that decision-making by top management is increasingly dependent on real-time data generated from integrated database systems. It is recommended to develop a managerial dashboard and database-based analytics system that can facilitate the process of strategic decision-making in a fast, adaptive, and measurable manner, especially in dealing with global issues such as the energy crisis, digitalization, or climate change.

Global Collaboration and Organizational Culture Adaptation

Zolak Poljašević et al. (2025) and Purgał-Popiela & Knap-Stefaniuk (2021) highlight the importance of global collaboration and organizational culture adaptation in the context of multinational organizations. Databases can be used to manage information across countries and cultures, support organizational cultural adaptation, and strengthen international collaboration networks. Further research needs to delve deeper into how database systems can facilitate international collaboration and support effective organizational culture adaptation across countries and cultures.

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