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"PEOPLE ANALYTICS AND BIG DATA IN HRM: A BIBLIOMETRIC ANALYSIS"

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Introduction

Organizations have begun to use data in making better decisions in recent years and the field of human resource management (HRM) has been no exception to this change. Historically, HR decisions were made on the basis of experience and intuition, but as digital technologies are gaining more and more traction, the emphasis on using data and analytics to manage employees is increasingly becoming popular. This has seen the rise of people analytics and big data in the HRM where organizations have been using data to learn the behaviour of employees, enhance performance and aid strategic decision making (Arora et al., 2021).People analytics can be defined as the application of data analysis methods to make rational decisions regarding employees whereas big data allows organizations to process a significant amount of structured and unstructured data in a variety of sources (Sharma, 2026). Combined, they assist the organization in understanding more about recruitment, employee engagement, performance management, and retention (Lengnick-Hall et al., 2018). The application of modern technologies, such as artificial intelligence and machine learning, has enhanced the role of analytics in HR even more, making it more predictive and strategic in its nature. Meanwhile, the increasing popularity of this field has led to numerous research studies being published in many disciplines. Nonetheless, the available literature remains sporadic, and it is necessary to comprehensively analyze and comprehend the evolution, tendencies, and the major themes in this field. It is at this point that bibliometric analysis comes in handy since it aids in analyzing the framework of a study, unravelling the influential researches and also in bringing out new areas (Saputra et al., 2022). In that way, the current paper is expected to offer a thorough bibliometric review of people analytics and big data in HRM. It is preoccupied with the cognition of the trends in publication, sources, important papers and major research themes in the sphere. In such a way, the study would be important to the researchers and practitioners and contribute to deciding the research directions in this rapidly expanding field in the future (Nocker & Sena, 2019).

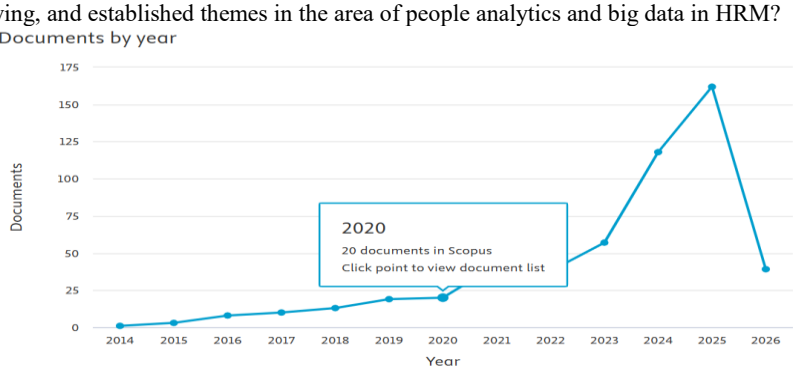
Methodology

In this research, the approach taken is the bibliometric analysis approach of the research environment as a systematic assessment of the research environment of people analytics and big data in human resource management (HRM). As a quantitative approach of analyzing academic literature and determining trends, bibliometric analysis is applied to identify the trends of publications, sources of influence, major authors, and research themes. This method is appropriate to give an overall view of a rapidly expanding subject of study (Madhuri & Kumar, 2025). The information used to conduct the study was gathered through the Scopus database because it is among the largest and most credible peer-reviewed literature databases. The search query was structured, and the following keywords were included: "HR analytics," people analytics, workforce analytics, and big data, as well as the key terms related to them, including machine learning and artificial intelligence. Relevant subject areas and document types were used to limit the search to obtain quality and relevant data. An end dataset of publications was made after filtering and eliminating any duplicates or irrelevant records (Setiawan & Rismawati, 2024). Biblioshiny (a web interface of Bibliometrix package in R) that has been widely used in bibliometric studies was used to carry out the analysis. This tool was utilized to conduct some analyses such as annual scientific production, most relevant sources, most cited documents, co-occurrence of key words as well as thematic mapping. Also, the co-word analysis and Multiple Correspondence Analysis (MCA) methods were used to determine the conceptual frameworks and research themes in the domain.The paper is devoted to such bibliometric indicators like the number of publications, citation number, the number of citations per year, and frequency of keywords. There was also the creation of visualizations such as word clouds, conceptual structure maps, and thematic maps to have a clearer picture of how various matters in research interrelate.

Research Questions

According to the objectives of the given study, the following research questions are developed to inform the bibliometric analysis of people analytics and big data in the field of HRM:

RQ1: How does the trend of scientific publications in the area of people analytics and big data in HRM change over time?
RQ2: What are the most significant sources of information (journals, books, and conference proceedings) to this field?
RQ3: Who are the most influential writers and what are the most worldwide referred records in this field?
RQ4: Which keywords and major research themes in people analytics and big data are the most used in the HRM field?
RQ5: What are the structures and interrelationships in the different research themes in the field?
RQ6: What are the new, growing, and established themes in the area of people analytics and big data in HRM?



Annual Scientific production

The trend in the number of research papers on HR analytics between the periods of 2014 and 2026 is evidently on the increasing side, thus indicating that the subject has received significant attention over the years. Very few articles have been found in the early years (2014 to 2018), increasing gradually, with only 1 paper in 2014 and 13 in 2018. This indicates that it was a new and emerging field. Between 2019 and 2022, the quantity of publications began to grow steadily and reached a high of 38, which suggests that the interest of a greater number of researchers in this field began to grow. The significant growth is observed after 2022, when the number of papers grew significantly and peaked in 2023 with 57, 2024 with 118, and 2025 with 162. This high increase indicates that HR analytics is a trendy and valuable research topic, particularly

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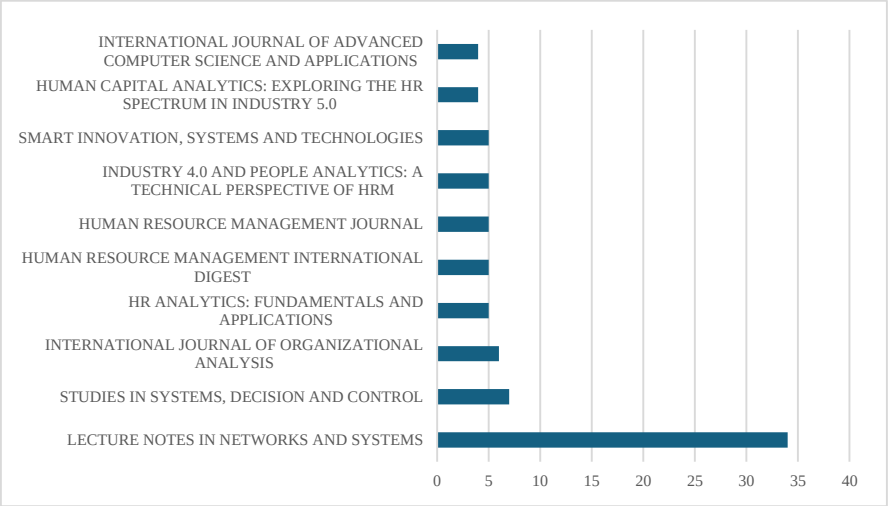
as technologies such as artificial intelligence and data analytics continue to be widely used in HR. Even though this number decreases to 39 in 2026, it does not imply that interest is down because the year is not over yet, and there are numerous papers that are still waiting to be indexed. Altogether, the statistics indicate that HR analytics is developed as a minor research to a well-developed and rapidly expanding field.



Most Cited Sources

The review of the most referred sources indicates that studies on HR analytics are distributed in both technology and HR-oriented publications. Lecture Notes in Networks and Systems (34) offer the most papers, which proves that much of the research on HR analytics is associated with technical and computational fields. The second position is held by Studies in Systems, Decision and Control (7) and International Journal of Organizational Analysis (6) with a combination of decision science and organizational research. A number of journals like Human Resource Management Journal, Human Resource Management International Digest, and HR Analytics: Fundamentals and Applications have also provided an equal number of papers (5 each), which seems to reflect the increased value of HR-oriented journals in the same area. According to other sources such as Industry 4.0 and People Analytics: A Technical Perspective of HRM and Smart Innovation, Systems and Technologies, it is evident that Hr analytics and digital transformation and modern technologies are closely interrelated. Besides, other sources like Human Capital Analytics: Exploring the HR Spectrum in Industry 5.0 and International Journal of Advanced Computer Science and Applications also prove the fact that the field is interdisciplinary, which means that it integrates human resource management with advanced computing and new concepts of the industry. Generally, it can be stated that the publication distribution indicates that HR analytics is not a one-dimensional concept but is closely backed by the areas of technology and systems-based research.

S.No	Paper	DOI	Total Citations	TC per Year	Normalized TC
1	ANGRAVE D, 2016, HUM RESOUR MANAGE J	10.1111/1748-8583.12090	457	41.55	6.08
2	SIVATHANU B, 2018, HUM RESOUR MANAGE INT DIG	10.1108/HRMID-04-2018-0059	288	32.00	6.07
3	GIERMINDL LM, 2022, EUR J INF SYST	10.1080/0960085X.2021.1927213	232	46.40	10.53
4	MARGHERITA A, 2022, HUM RESOUR MANAGE REV	10.1016/j.hrmr.2020.100795	228	45.60	10.35
5	VAN DEN HEUVEL S, 2017, J ORGAN EFF PEOPLE PERFORM	10.1108/JOEPP-03-2017-0022	190	19.00	3.78
6	HAMILTON RH, 2020, BUS HORIZ	10.1016/j.bushor.2019.10.001	184	26.29	7.78
7	KIM S, 2021, HUM RESOUR MANAGE	10.1002/hrm.22049	147	24.50	5.25
8	SHET SV, 2021, J BUS RES	10.1016/j.jbusres.2021.03.054	139	23.17	4.96
9	HUANG X, 2023, ASIA PAC MANAGE REV	10.1016/j.apmrv.2023.04.004	128	32.00	10.18
10	DAHLBOM P, 2020, BALTIC J MANAGE	10.1108/BJM-11-2018-0393	125	17.86	5.29

Most Global Cited documents

The discussion of the most worldwide referenced papers within the sphere of HR analytics demonstrates the list of the most powerful works which influenced the evolution of the sphere. Among them, the article by Angrave (2016) has the largest number of citations (457), which means that it has been a pillar to defining HR analytics as a significant research topic. It is then followed by Sivathanu (2018) with 288 citations and is also a time when initial contributions were made that contributed to the momentum in the field. Newer research, including Giermindl (2022) and Margherita (2022) has received high attention with many citations and highest citations per year, and it may be suggested that new research is quickly impacting the field. On the same note, Huang (2023) also has a high normalized citation score, meaning that its impact is strong and rapidly growing as well, even though the article is quite recent. The academic interest is consistent over time, as other significant works by authors such as Van den Heuvel (2017), Hamilton (2020), Kim (2021), and Shet (2021) demonstrate. In general, this citation pattern indicates that although, initial studies provided the basis of HR analytics, new studies are getting attention at a more rapid pace, which demonstrates the dynamic and changing nature of the discipline.

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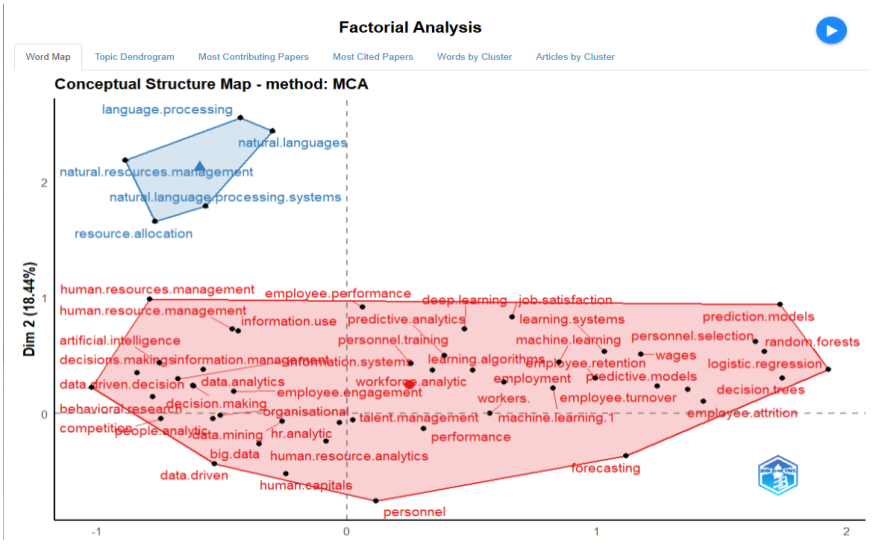
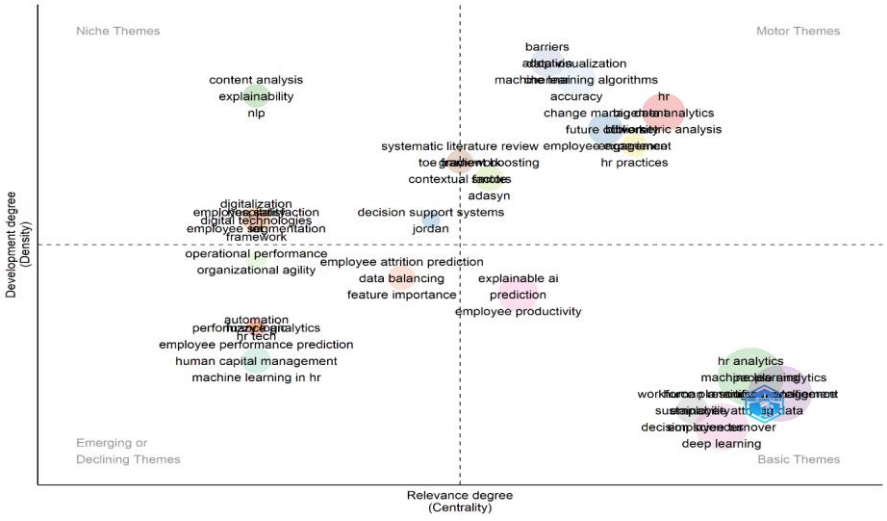
The analysis of keywords in the form of a word cloud gives a clear image of the primary themes in the HR analytics research. Human resource management (95) is the most widespread term to occur, and it reveals that the subject is highly established, and the traditional HR concepts are very strong in the field. Decision making (77) comes in the next, pointing out the fact that one of the primary functions of HR analytics is to aid in making improved organizational decisions. Such terms as machine learning and artificial intelligence are used quite frequently, which suggests the use of more sophisticated technologies in HR practices. In a like manner, predictive analytics (66) indicates that forecasting as well as data-driven insights is an area of concern. Personnel and learning systems are other terms that demonstrate relationship with employee management and organizational learning. The existence of several variations such as HR analytic, machine learning, and human resources management also suggests a certain inconsistency in the use of key words in the studies. On the whole, the word cloud indicates that HR analytics is an interdisciplinary area of human resource management, data analytics, artificial intelligence, and decision-making (Jawaid et al., 2026).



The Multiple Correspondence Analysis (MCA) conceptual structure map indicates the grouping and relationship of various research themes in HR analytics. The map mostly demonstrates two extensive groups. The bigger and the first cluster (marked in red) is the core of HR analytics study. It incorporates the most important issues, including human resource management, performance of employees, predictive analytics, machine learning, employee retention, attrition, and decision-making. This cluster suggests that the majority of studies are aimed at applying data and state-of-the-art technologies, such as artificial intelligence and machine learning, to make HR decisions, forecast employee behavior, and improve the performance of the organization. It also demonstrates close links to such concepts as talent management, employee engagement, and workforce analytics, implying that they are the core themes of the field.The smaller cluster (in blue) is more technical and specialized, and deals with the areas such as natural language processing, language processing system, and resource allocation. This shows a niche research area where sophisticated computational methods are used in HR settings, though not as dominant as the core cluster. In general, the map indicates that the research of HR analytics is mostly focused on the data-driven decision-making process and employee-related results, with the use of emerging technologies in more specialized spheres. The distinction between clusters shows that even though this area is interdisciplinary, it is primarily focused on enhancing HR practices with the help of analytics and predictive models (Huang et al., 2023).



The thematic map helps to get a clear picture of the way various themes of research in HR analytics can be developed and how significant they are in the area. The map has four quadrants that are determined by two variables; development (density) and importance (centrality). The themes of HR analytics, bibliometric analysis, employee engagement, and HR practices have been developed and are very important in the motor themes quadrant (top-right). These are the motive of the field and are mature and researched fields. Within the basic themes quadrant (bottom-right), such themes as machine learning, big data, decision-making, employee turnover, and deep learning are very significant yet are still in the development. These are the basis of the existing research and are extensively utilized in the studies despite the fact that they are not finished yet.Top-left quadrant is the niche themes, which encompasses natural language processing (NLP), explainability, and content analysis. They are well established yet less related to the primary area of study, that is, they are specialized subjects with a limited but narrow research.Lastly, there is the emerging or fading themes quadrant (bottom-left), which comprises areas as automation, HR technologies, predicting employee performance, and human capital management. These are new themes that are gaining

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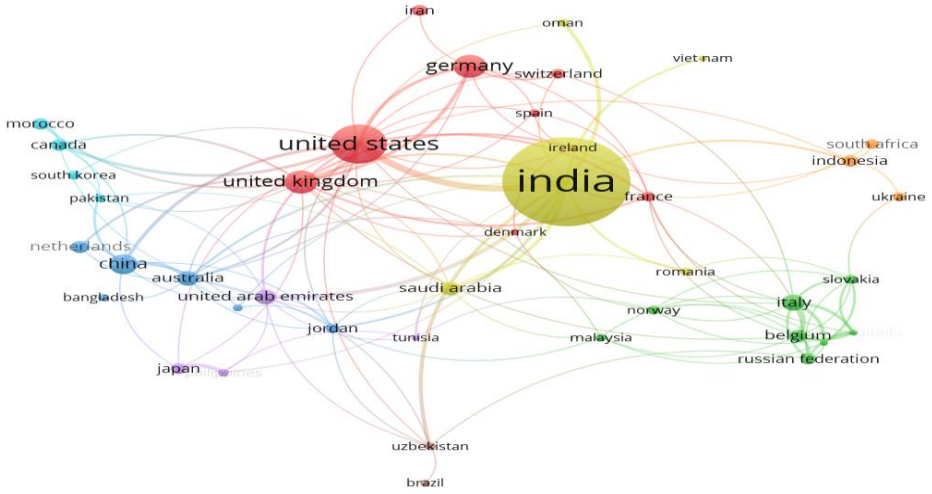
popularity and are expected to emerge in this AI era. On the whole, the thematic map reveals that the research of HR analytics is well motivated by the central HR and analytics issues, as well as it reaches further technologies and newer directions, which means maturity and the ongoing development of the field.



Country Collaboration Analysis

The country collaboration network offers the information about how various countries are making contributions and are working together in the area of people analytics and big data in HRM. The contribution level of India is the highest according to the map because the node size is the largest, which implies that India is the most active country in this research field. The collaboration ties of India with other nations are also good; India has close collaboration ties with the United States and the United Kingdom, which are also the leading contributors of the field. Another important hub that is shown in the network is the United States, where it has several links to Germany, Spain, and Switzerland. This means that it has a powerful influence and is at the centre of research cooperation in the world. In the same way, the United Kingdom demonstrates active cooperation with such countries as Australia, China, and the United Arab Emirates, which indicates its significant role in global research networks.Another cluster is constituted by European countries like Italy, Belgium and the Russian Federation, which exhibit close cooperation amongst themselves. Besides that, other countries such as China, Australia, and Netherlands also play a significant role and are well integrated in the network. New contributions may be observed in the form of Saudi Arabia, Malaysia, and Indonesia countries which are slowly becoming members of the world research partnership.

Thematic Analysis

1. HR Analytics and Data-Driven Decision Making: An important theme in the area of people analytics and big data in HRM is the transition to data-driven decision making (Kayusi et al., 2025). In a traditional manner, experience and intuition are the factors used in HR decision-making, although lately organizations tend to utilize data to inform their strategies. The use of the HR analytics assists in workforce planning, talent management, performance assessment, and policy development (Saha, 2020). Through data, organizations are able to use data to make more precise, objective and timely decisions. The theme is very significant as it is the basis of the present day HR practice and the increasing demand of evidence based management. Such prevalence of this theme in the literature demonstrates that HR analytics is not only an assistant tool but has evolved to be a strategic operation in organizations (Gurusinghe et al., 2021).

2. Machine Learning and Artificial Intelligence in HR: The topical theme in the analysis is the integration of machine learning and artificial intelligence into HR processes. The technologies enable organizations to examine big and complex data sets effectively. The predictive use of machine learning models can be applied in predicting employee turnover, high-performing employees and enhancement of the recruitment processes. Other fields that are being implemented using artificial intelligence include resume screening, chatbots to communicate with employees, and customized learning systems (Raza et al., 2025). The theme is very important in the context of technological innovation of HRM and demonstrates the shift of organizations to automation and smarter decision-making systems. The growing body of research in the field suggests that AI and machine learning are becoming key solutions to HR in the future (Cavanagh et al., 2023).

3. Employee Performance, Engagement, and Retention: The other theme of considerable interest is the comprehension and enhancement of the performance, engagement, and retention of employees using analytics. Organizations are relying on data to track employee productivity, gauge the level of engagement, and determine factors that drive job satisfaction (Donthu et al., 2024). Predictive analytics are also applied to identify employees who are likely to leave the organization so that the HR managers can be able to take preventive measures. The significance of this theme is that, outcomes related to employees are directly related to the success of the organization. The literature demonstrates that people analytics is a key to improving employee experience and creating a motivated and productive workforce (Angulakshmi et al., 2024).

4. Big Data and Predictive Analytics in HRM: The concept of big data and predictive analytics is one of the main themes of the field because it allows organizations to manage and analyze large amounts of employee data collected across various sources (Ayanponle et al., 2022). Predictive analytics is useful in predicting future trends like the hiring requirement, employee turnover, and performance outcomes (Nagpal & Pawar, 2024). Big data enables the organization to understand patterns in the workforce and takes a proactive decision. This theme demonstrates the increasing significance of technology in HR and emphasizes the fact that the data is now being utilized not only to analyze but to predict and strategize. It also demonstrates the transition between old-fashioned HR practices to newer and more data-driven methods (Kurchellapati & Challapalli, 2026).

5. Digital HR Transformation and HR Technologies: Another major theme is the integration of digital technologies in HR, as it is commonly called digital HR transformation. This encompasses HR information systems, cloud-based systems, automation systems, and HR technology solutions to enhance efficiency and effectiveness (Saling & Do, 2020). Digital transformation helps organizations to automate their HR operations, minimize manualization, and improve the experience of employees. It also facilitates the process of analytics implementation in daily HR practices (Karuppiah & Kumaran, 2025). The existence of such theme means that technological advances are causing a major change in HR, making it more dynamic and adaptive to organizational requirement (Qin et al., 2025).

6. Emerging Areas: Explainable AI and Advanced Analytics: Other themes of analysis are explainable AI, natural language processing, and sophisticated methods of analysis, which are also emerging (Apeh et al., 2024). The areas are in their developmental stages yet are being looked

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into in current studies. Explainable AI is concerned with making machine learning models more transparent and understandable which plays an important role in developing trust in HR decisions (Rai & Singh, 2023). Employee feedback, resumes, and communication data are analyzed using natural language processing. These new trends indicate where the research in the field of HR analytics is moving in the future, where advanced technologies are not only used but also made more dependable and easier to use (Vhora et al., 2024).

Discussion

The results of this bibliometric analysis indicate quite evidently that the research on people analytics and big data in HRM has been expanded considerably over the years in terms of its volume and depth. The fact that the number of publications is increasing, particularly after 2022, suggests that this sphere acquires significant academic and practical significance. Among the most important observations is the fact that the field is extremely interdisciplinary and it integrates the ideas of human resource management, data analytics, artificial intelligence, and information systems. This has been integrated in a manner that enables researchers to delve into novel methods of enhancing HR operations by use of data-driven methods (Dlamini, 2023).The thematic analysis also reveals that the essence of the field is the HR analytics and decision-making which are backed by machine learning and big data technologies (DiClaudio, 2019). Meanwhile, such issues as employee engagement, performance, and retention reveal that the final aim is to enhance the outcomes associated with employees. The emergence of such new trends as explainable AI and natural language processing means that the sphere is moving towards more sophisticated and transparent methods of analysis. Nevertheless, the analysis also shows certain discrepancies in the usage of keywords and a focus on research in specific spheres, which implies that the future research can be standardized and diversified.

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