

What are the Trends of AI Technology Towards HCM?

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Abstract

This research aims to identify research trends regarding Artificial Intelligence (AI) technology towards Human Capital Management (HCM). Research on AI technology for HCM was rare, while the phenomenon indicates more companies were implementing HCM. Still, it has not been utilized as a research object, especially in strategic HRM. The purpose of this research is to identify AI technology trends in HCM with 6 Research Questions (RQ). The research design is a quantitative approach, and the research method is a Systematic Literature Review (SLR). Data using Crossref database with criteria: 1) the type of data used in the form of journal-article, and proceeding-article, 2) the keywords used were “AI technology, Human Capital Management” for 2020-2024, and 3) restrictions were made only on searching articles using English. Searching data using Publish and Perish. Data analysis using VOSviewer, and analysis techniques are descriptive statistics. The research results indicates: RQ1) over 5 years, there were 685 articles related to AI technology towards HCM, RQ2) Journal of Human Capital was a journal that published the most articles (30 articles); RQ3) the publisher which published the most articles was Elsevier (44 articles); RQ4) the authors who were active in researching AI technology towards HCM (Belchich, Pratama, Palahusynets, Kwiecień), each of whom has published 2 articles; RQ5) an article written by Haldorai et al. in 2022 was the most cited (170 citations); RQ6a) the network visualization indicates there were 4 clusters; RQ6b) article titles with AI technology towards HCM in yellow were related to the keywords human resources management, adoption, artificial intelligence, employee engagement, competitive advantage, selection, collaboration; and RQc) the density visualization indicates the highest weight was capital, while the others had quite low weights, although there was still a faint yellow color. The findings of this research provide implications: 1) expanding the theory of HCM by incorporating AI technology (theoretical implications); 2) providing a basis for developing more targeted research methods for studying AI technology in HCM (implications for future research); and 3) assisting organizations in enhancing performance and strategic decision-making in HRM (practical implications).

Keywords: AI, HCM, HRM, Technology.

INTRODUCTION

The introduction should establish a comprehensive overview of the increasing importance of Artificial Intelligence (AI) in the realm of Human Capital Management (HCM) (Cheng, & Hackett, 2019). In recent years, AI has emerged as a transformative force in various business processes, and its applications within HCM have attracted considerable attention (Davenport, & Ronanki, 2018). The introduction must frame this growing significance, reflecting on how AI technologies are revolutionizing HCM practices such as recruitment, performance management, talent development, and decision-making processes. This is largely due to the ability of AI to handle large volumes of data efficiently, improve accuracy in talent assessments, and streamline various HR functions.

It is essential to highlight the research gap at the intersection of AI and HCM, with a specific focus on strategic Human Resource Management (HRM) (Daugherty, & Wilson, 2018). While much research has explored the broad implications of AI in business and HRM, the nuanced integration of AI within strategic HRM is underexplored. The need for research into how AI technologies are strategically leveraged to enhance the workforce, improve organizational outcomes, and align with broader business goals remains unmet. Identifying this gap in current literature is crucial to contextualizing the purpose and relevance of the research.

The significance of this study lies in its contribution to strategic HRM. HCM is inherently linked to an organization's ability to leverage human resources effectively to achieve its strategic objectives. The advent of AI technology provides new tools and methodologies for improving HR practices. This study aims to explore how AI can be optimally used to manage human capital and inform strategic decisions in HRM. Such insights will not only benefit academic discussions but will also have practical implications for HR professionals and organizations looking to implement AI-driven HCM practices.

To provide a robust and structured analysis, the research objectives are clearly defined. The primary aim is to identify trends in the application of AI technology within HCM. This is undertaken by addressing six distinct research questions (RQs), which are designed to dissect various aspects of AI's role in HCM. These RQs are structured to provide clarity on the extent of existing research, key contributors in the field, publication sources, and the nature of AI applications in HCM. This focused approach enables a detailed exploration of the subject and helps in identifying gaps and opportunities for future research.

Key components that are integral to the introduction include a detailed background on AI technology in HCM, providing a foundational understanding of how AI is being utilized to transform HR processes. This background will help set the stage for understanding the research questions and objectives. Additionally, the introduction must identify the research gap by presenting an analysis of how the current body of knowledge falls short in addressing the strategic use of AI within HRM. This will establish the relevance and necessity of the study.

Finally, by stating the research objectives clearly, the introduction should outline how the study aims to address the identified research gap. This will involve articulating the six research questions (RQ1 to RQ6) that guide the investigation. Each research question will focus on a specific aspect of AI technology's application in HCM, allowing for a comprehensive examination of current trends, challenges, and future directions in the field.

METHODS

This section details the research design and methodology employed to achieve the study's objectives effectively (Karatas, 2021). The approach taken in this research is carefully structured to provide clarity and rigor in data collection and analysis, ensuring that the research questions are comprehensively addressed.

The research design adopts a quantitative approach to systematically examine the topic. To achieve a comprehensive understanding, a Systematic Literature Review (SLR) was conducted. This method allows for a structured and methodical review of existing literature on AI technology within Human Capital Management (HCM). The SLR approach is particularly effective in identifying, assessing, and synthesizing findings from multiple sources, thereby offering a robust foundation for trend identification and further analysis of research developments in the field.

Data collection for the study was sourced primarily from the Crossref database, a comprehensive repository of scholarly articles. To ensure relevance and focus, several selection criteria were applied. The study specifically targeted journal articles and proceeding articles published between 2020 and 2024. The keywords used for data retrieval were “AI technology” and “Human Capital Management,” reflecting the study’s focus on the intersection of these fields. Additionally, a language restriction was applied, limiting the selection to English-language articles to maintain consistency in analysis. The "Publish or Perish" software was utilized to facilitate the data search process, allowing for efficient retrieval and organization of relevant literature.

In terms of data analysis, the visualization of research trends was carried out using VOSviewer, a tool designed to analyze and visualize bibliometric networks. This enabled the identification of key patterns and relationships within the body of literature. To complement the visual analysis, descriptive statistics were applied to interpret and summarize the data quantitatively, providing a clear depiction of trends, distributions, and other relevant metrics. This combined methodological approach ensures a thorough and nuanced understanding of the research landscape regarding AI's role in HCM.

RESULTS

The findings of the study are organized according to the six research questions (RQs) that guide the investigation, each revealing significant trends and insights about AI technology's application within Human Capital Management (HCM).

For RQ1, the study discovered that over a five-year period, a total of 685 articles were published related to AI technology in the context of HCM. This substantial number of publications highlights the growing academic interest and exploration in how AI is impacting and transforming human capital practices.

In addressing RQ2, it was found that the Journal of Human Capital was the most prolific publisher in this area, with a total of 30 articles related to AI and HCM. This suggests that this journal is a primary outlet for scholarly discussions and advancements on the subject.

RQ3 reveals that Elsevier stands out as the publisher with the highest output of related articles, contributing 44 articles to the literature on AI and HCM. This underscores Elsevier’s active role in disseminating research on AI technologies and their influence on human capital practices.

When examining RQ4, the findings indicate that authors such as Belchich, Pratama, Palahusynets, and Kwiecień have been the most active contributors to the research on AI in HCM, each having published two articles in the specified time frame. Their consistent contributions highlight their prominence and ongoing research interest in this emerging field.

RQ5 focuses on the impact of individual publications. The study identified that the article by Haldorai et al. (2022) was the most cited work within this domain, accumulating 170 citations. This level of citation signifies the article's considerable influence and its pivotal role in shaping the discourse around AI’s application in HCM.

Finally, RQ6 provides a comprehensive visualization of research trends:

- 6a: A network visualization analysis revealed four distinct clusters within the research, indicating thematic concentrations and linkages among various studies in AI and HCM.
- 6b: A keyword visualization, marked in yellow, highlighted connections between terms such as "human resources management," "adoption," "artificial intelligence," "employee engagement,"

"competitive advantage," "selection," and "collaboration." These keywords suggest the focal points of the research in this domain and their interrelationships.

- 6c: The density visualization showed that the term "capital" held the highest weight among the analyzed keywords, indicating its centrality in the research. In contrast, other terms were represented with lower weights, depicted in a faint yellow hue, suggesting their relatively lesser prominence in the literature.

These findings collectively provide a detailed overview of the current research landscape concerning AI technology in HCM, identifying key publication outlets, authors, influential works, and emerging themes within the field.

DISCUSSION

This section aims to interpret the findings by situating them within the context of existing literature and discussing their implications on Human Capital Management (HCM) in relation to Artificial Intelligence (AI) technology. The findings contribute significantly to understanding the theoretical, future research, and practical aspects of integrating AI into HCM.

Theoretical Implications

The study's theoretical implications are centered around expanding the understanding of HCM by integrating the role of AI technology. Traditional views on HCM have predominantly focused on human-centric practices and strategies; however, the incorporation of AI provides a new perspective on the evolution of HCM practices. The findings demonstrate how AI technologies facilitate data-driven decision-making, talent acquisition, performance evaluation, and predictive analytics, thereby offering a fresh theoretical lens through which scholars and practitioners can analyze HCM. This shift towards an AI-augmented model of HCM enables a more dynamic approach to managing human capital, where technology complements human effort and fosters innovative HR practices.

Implications for Future Research

The study provides a critical foundation for future research, offering a structured pathway for scholars to explore more targeted aspects of AI's role in HCM. The identified research trends highlight the need for further examination of specific AI technologies, such as machine learning algorithms and big data analytics, and their applications in HCM practices. Moreover, the analysis of active authors, influential publications, and emerging keywords in the research presents opportunities for delving into topics like employee engagement, AI adoption, and strategic HRM. Future research could focus on developing frameworks to measure AI's impact on HCM effectiveness, ethical considerations in AI deployment, and cross-cultural implications of AI use in various organizational settings.

Practical Implications

From a practical standpoint, the study provides valuable insights for organizations aiming to enhance their performance and strategic decision-making capabilities in HRM. By understanding the current trends and applications of AI technology in HCM, practitioners can make informed decisions on how to integrate AI tools into their HR processes effectively. AI can streamline recruitment and selection processes, automate administrative tasks, and support predictive workforce analytics, enabling HR professionals to focus on strategic functions. The findings emphasize that successful AI implementation in HCM requires aligning technology with human-centric goals to maximize organizational performance and employee satisfaction.

The integration of AI into HCM also holds implications for workforce planning, talent development, and employee engagement. AI-driven insights allow for more accurate predictions

about workforce needs, personalized training, and development opportunities, and enhanced employee experiences through tailored HR practices. Organizations that embrace AI technologies in their HCM strategies are better positioned to adapt to market changes, maintain competitive advantages, and improve overall productivity and efficiency.

Furthermore, the study indicates that a strategic partnership between humans and machines is essential for optimizing the benefits of AI in HCM. This partnership requires developing the skills of HR professionals to work effectively with AI tools and ensuring that ethical considerations are upheld in AI applications. Organizations must also foster a culture of collaboration between humans and AI, where technology supports human decision-making and creativity rather than replacing it.

In conclusion, the study's findings provide a holistic view of the interplay between AI and HCM, offering theoretical insights, avenues for future research, and practical recommendations for organizations. The emphasis on both the technological and human elements of HCM ensures a balanced approach, promoting the use of AI as a tool to enhance, rather than overshadow, human capital within organizations. This balanced integration of AI in HCM practices holds the potential to transform traditional HR functions, promote strategic decision-making, and support sustainable organizational growth.

CONCLUSION

The conclusion of the study should effectively summarize the key findings and underscore their significance. The research highlights the evolving landscape of Human Capital Management (HCM) through the integration of Artificial Intelligence (AI). The findings reveal that AI's role in HCM is both substantial and transformative, impacting various aspects such as talent acquisition, workforce analytics, performance management, and strategic decision-making. By identifying the growing number of publications and active contributors in this area, the study emphasizes the increased attention AI has received in the context of HCM. The significance of these findings lies in their ability to bridge theoretical frameworks and practical applications, fostering a deeper understanding of how AI can enhance HCM practices to improve organizational performance.

Moreover, recognizing the influence of AI on HCM is crucial for both academia and industry practitioners, as it introduces new dimensions to both the theory and practice of human resource management. The study suggests that AI's integration into HCM will continue to shape future research opportunities, particularly in developing methods to measure AI's impact on workforce development and strategic HR decisions. Additionally, practical applications of AI in HRM are expected to expand, offering opportunities for organizations to adopt AI technologies that align with human-centric goals, thus fostering a more efficient and responsive HR ecosystem. This emphasizes the need for ongoing research and innovation to optimize AI's potential in transforming traditional HR practices while addressing challenges such as ethical considerations and the alignment of AI tools with organizational culture and objectives.

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