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ENHANCING JOB DESIGN WITH ARTIFICIAL INTELLIGENCE: WHAT WE KNOW AND WHAT LIES AHEAD

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Abstract

As businesses undergo digital transformation, artificial intelligence (AI) is reshaping job design by automating tasks and redefining human roles. This shift presents a critical challenge for human resource professionals and managers, which is how to integrate AI into work while maintaining productivity, fairness, and employee well-being. To clarify the evolving landscape, this study synthesizes the state-of-the-art literature on AI-driven job design through a multi-technique bibliometric analysis and a scoping literature review, made more rigorous by following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Analyzing 67 Scopus-indexed publications, we use descriptive bibliometrics, co-authorship mapping, bibliographic coupling, and co-occurrence analysis to trace past research directions and outline a future research agenda. Our findings reveal key themes, including AI's impact on job characteristics, data-driven human resource management (HRM) practices, group-level AI integration, emerging job skills, human-AI trust, labor relations, and algorithmic HRM. As one of the first bibliometric studies in this field, this research provides a foundational framework for understanding AI's role in job design and identifies seven distinct pathways for future investigation.

Keywords: *Job design, Work design, Artificial intelligence, Bibliometric review*

JEL classification: *M12*

Introduction

In the past half a century, very few topics have gained as much focus from organizational scientists as job design, being one of the crucial human resource management (HRM) functions in contemporary organizations (Oldham & Fried, 2016; Bakker & de Vries, 2021). Foundationally, job design, also referred to as work design, is the actual structure of the jobs performed by the workforce in a certain organization

(Naqshbandi et al., 2024). Hence, this HRM activity pays attention to just the work that needs to be done, i.e., the activities and tasks that need to be completed daily to achieve the goals of the organization.

Interestingly, the first works in the research field argued that employees would be able to devote their attention to fewer tasks and improve their job-related skills if the jobs were simplified and specialized to the greatest extent possible (Oldham & Fried, 2016). Fifty years onwards and researchers put digitalization and business technology into the equation as a tool for simplification and specialization of jobs (Wang et al., 2020).

Recently, calls for the democratization of work as well as deconstructing and reconstructing jobs have become more mainstream in the job design discourse. By this, we mean a process of higher-level input from the employees about how, what, when, and where the professional tasks should be performed (Rogiers & Collings, 2024). Also, this process is characterized by the intensive use of technology, especially Technology 4.0 and 5.0, in the sense that these technologies can take over some portions of the tasks, which are more mundane and repetitive, thus reconstructing jobs as we know them (Parker & Grote, 2022).

One of the trademarks of both Technology 4.0 and 5.0 is artificial intelligence (AI), which refers to the use of human intelligence in machines with the aid of technological innovation (Bohr & Memarzadeh, 2020). Research on AI applications in the business and management contexts has particularly intensified since the launch of affordable and accessible generative AI in the form of chatbots and large language models (LLM) such as ChatGPT (Zhang & Parker, 2023). In this sense, both relief and fear spread among practitioners, where some viewed AI as an agency for delegating some tasks, increasing efficiency and productivity, while some as the tool that will replace them and take the entire decision-making power in contemporary organizations, resulting in mixed public opinions (Charlwood & Guenole, 2022; Suseno et al., 2023). The dilemmas about the use of AI and its implications for the future of work have been observed in healthcare, education, consulting, manufacturing, and other industries, triggering scientific studies in the field of HRM, motivated by the need to understand the new place of AI in the modern office.

Despite the double-sized projections, claims, and scholarly interest around the use of AI for job design purposes, a search query in the Scopus data revealed to us that there is a need for a synthesis of current findings regarding this topic so that the field can be further advanced. As a result, the objective of our study was to analyze the use of AI for job design as an HRM function, investigate the research hotspots, most influential voices, and publication trends, and identify some avenues for future research. Stemming from this, we set out to answer the following research questions:
RQ1. How have the academic outputs related to AI and job design grown and evolved in the past?
RQ2. Who are the major contributors to these outputs?
RQ3. What are the dominant research hotspots and themes surrounding the use of AI for job design?
RQ4. What are the pathways for new research in the field?

Hence, we use a multi-technique bibliometric analysis approach, consisting of descriptive analysis, co-authorship analysis, and keyword co-occurrence analysis on secondary data extracted from Scopus-indexed scientific publications, following the rigorous Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) protocol (Page et al., 2021). This helped us to stress the most cited publications, and the most influential scientific voices, identify five distinct clusters of themes and seven new pathways for future research. Thus, the article is structured as follows. The next segment provides a detailed overview of how data was obtained and the methods used. Afterwards, we present the findings from the bibliometric techniques, followed by a discussion and review of the research field and ending with stating the future research directions and the conclusions.

Theoretical Background

AI has often been analyzed as an umbrella term for technologies wherein computers can do certain tasks just like a human would do them, displaying cognitive and technical abilities for decision-making

(Tambe et al., 2019). Some of the flagship technologies driving AI are machine learning approaches such as deep learning and neural networks, natural language processing, and similar (Qamar et al., 2021). All these advanced approaches process a barrage of network data from a certain input or inputs and ultimately deliver an output in the form of a decision, which is quite like how the human brain processes information (Kaushal et al., 2023).

Deductively speaking, AI is credited with revamping multiple HRM functions and activities including staffing, training, skills mapping, performance management, and others, where the evidence points to enhanced organizational performance (Deepa et al., 2024; Vrontis et al., 2023). In this sense, AI's role is to alter the knowledge creation and knowledge-sharing patterns in the organization, changing the processes of decision-making and problem-solving (Deepa et al., 2024). Even more specific HRM areas such as internal mobility, employee learning, managing employee well-being, diversity management, and more are subject to AI involvement to some degree (Malik et al., 2023; Vrontis et al., 2023). To complete these tasks and benefit both managers and employees, AI typically uses and processes huge quantities of data from platforms such as job portals, internal human resource management information systems, social media, and so on (Pereira et al., 2023).

One such HRM function is job or work design, which involves structuring work roles, tasks, and responsibilities to enhance employee productivity, satisfaction, and overall organizational effectiveness, determining how jobs are created, modified, and aligned with business strategies while considering human factors such as motivation, skills, and well-being (Lee & Lee, 2018; Parker & Grote, 2022). While a plethora of work design theoretical frameworks exist, one of the most prevalent is the job demands-resources model, which focuses on the importance of both job resources (aspects of the job that help employees achieve the goals) and job demands (the physical, psychological, social, and organizational factors of the work which are linked to a sustained effort or skills and thus, have certain psychological costs (Bakker et al., 2023). Furthermore, a large body of literature underlines that the outcomes of AI-enhanced job design can be negative in their essence, with algorithms lowering job resources and increasing job demands (Liu & Yin, 2024). On the other hand, another group of researchers advocates for a voluntarist approach, viewing the consequences of AI-enhanced job design as relative in the long run (Parent-Rocheleau & Parker, 2022). Additionally, this approach corresponds with the idea that the consequences of adopting a certain type of technology in management can be mainly the result of organizational choices, managerial decisions, and stakeholders' influence rather than the technology itself (Strohmeier, 2009). Hence, we believe that adopting a negative point of view from the start may hinder the opportunities for improving job design processes. This divided discourse was another motivation for us to undertake this research endeavor and further look into the inherent structure of the research field.

Hence, presently, AI systems augment managers' decision-making, while the next level in AI development and deployment in the organizational setting would be to fully and autonomously solve problems and make decisions, surpassing human intelligence and its decision-making capabilities (Kaplan & Haenlein, 2019). Considering this, the AI adoption in HRM activities signals a variety of benefits and opportunities as well as some plausible pitfalls, meaning that the rate of successful and effective adoption relies mostly on suitable managerial capabilities as well as views and opinions on technology.

Data and Methodology

To fulfill the objective of analyzing the use of AI for the purposes of job design as an HRM function, we employ a multi-technique bibliometric analysis approach, consisting of descriptive analysis, co-authorship analysis, and keyword co-occurrence analysis.

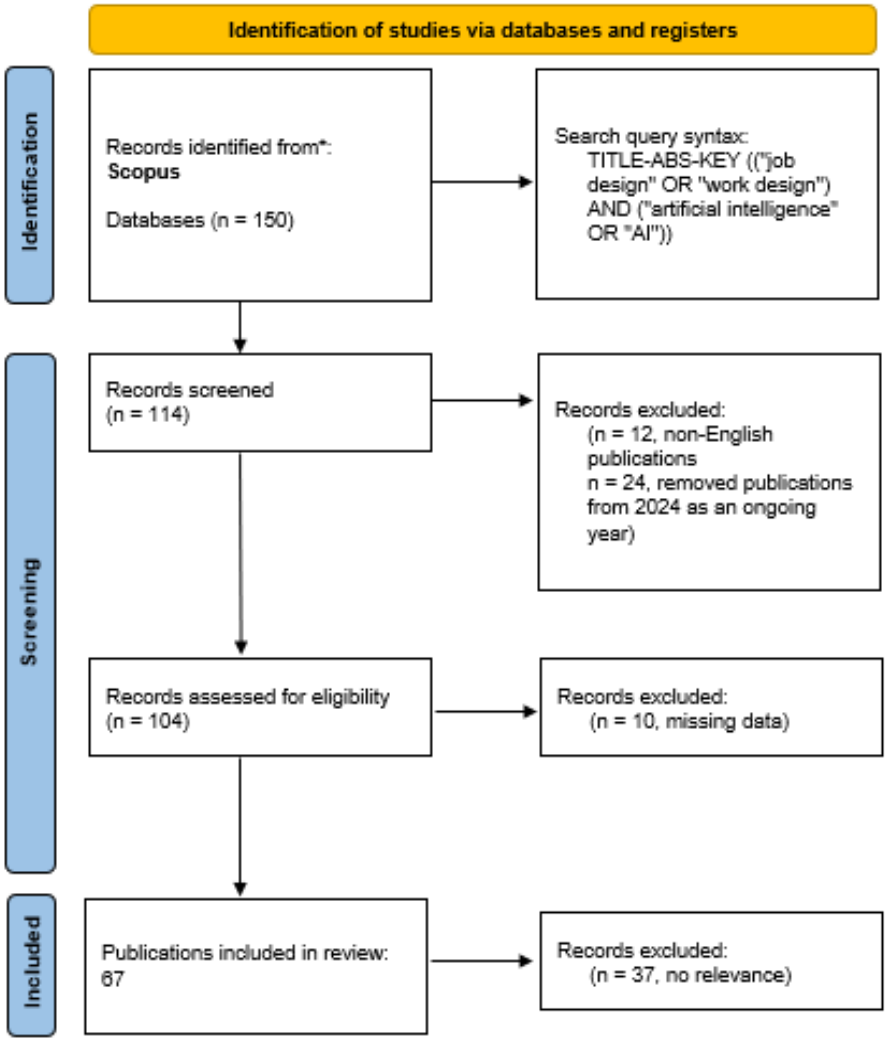
The ability to oversee published literature in a certain field from a more objective, bird's-eye view as well as the growing accessibility of data, has made this approach popular in management studies, despite it being well-established (Kessler, 1963). In this sense, bibliometric analysis, often referred to as science mapping, uncovers the inherent structure of a field, pointing out meaningful connections between different prevailing terms that mark the research field of interest (Zupic & Čater, 2015).

Additionally, our bibliometric analysis also considers a scoping literature review, grounded in the rigorous PRISMA guidelines for this type of scientific article (Page et al., 2021), which is used for cleaning the data and obtaining the final dataset. The undertaken steps per these guidelines are provided in Figure 1.

In an emerging interdisciplinary domain such as AI-enhanced job design, where literature is heterogeneous, rapidly evolving, and not yet comprehensively synthesized, a scoping review can be considered an appropriate methodological approach (Munn et al., 2018; Peters et al., 2015). Scoping reviews enable researchers to systematically map the breadth of research on a broad topic, accommodating diverse study designs and perspectives, while clarifying key concepts and identifying knowledge gaps, which can capture what we know and what lies ahead in nascent fields (Munn et al., 2018).

Furthermore, the use of the PRISMA extension for scoping reviews ensures rigorous and transparent reporting of the review process, which enhances the study's methodological transparency and replicability by providing a standardized framework for documenting the search, selection, and synthesis steps (Page et al., 2021). This is why we believe that this combined approach can enhance the credibility of the review and is well-suited to synthesize the complex, interdisciplinary scientific contributions on AI in job design in a systematic yet flexible manner.

Figure 1: PRISMA guidelines flowchart showcased by Page et al. (2021)



Source: Authors' work

Namely, for the bibliometric analysis, we used secondary data extracted from publications, which are indexed in the Scopus database, one of the leading databases for quality and global research. At first, a search query was performed on July 26, 2024, in the Scopus database, revealing an initial sample of 150 articles by applying the following syntax to look for these keywords in the titles, abstracts, and keywords: ((“job design” OR “work design”) AND (“artificial intelligence” OR “AI”)).

We did not specify a specific period, because we wanted to investigate the entire research landscape from its inception until 2023, the latest year, which is complete at the time of writing this article. In this sense, the subject area was also not specified so as we prevent limiting the articles to just specific subareas of research, when in reality, AI has been used for designing jobs in a variety of contexts and industries. After duplicate publications, publications not written in English, and publications with missing data were deleted, all publications in the sample were manually screened for relevance.

The final sample comprised 67 publications indexed in the Scopus database. They served as inputs for visualizing data networks using VOSviewer (version 1.6.20), which helped us investigate the relationships between the key concepts and terms that comprise the research landscape (Van Eck & Waltman, 2017).

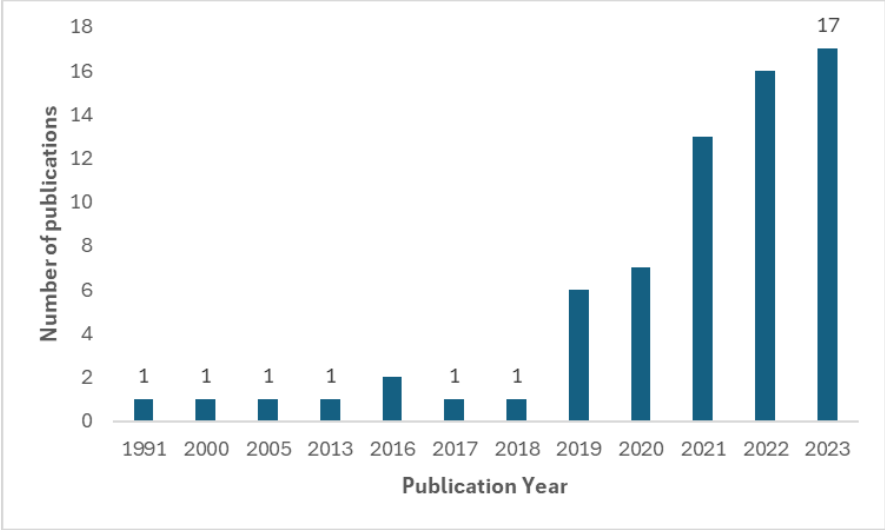
Results from the Bibliometric Analysis

Descriptive Analysis

As mentioned, the final dataset included 67 distinct, original scientific contributions, encompassing research from 1991, the year when the first article in the research field was issued, noting the impact of new technologies such as AI on how work is designed and performed (De Greene, 1991). Subsequently, during the last five years, the research field truly progressed under the influence of more accessible, human-like, and fast AI.

Illustratively, Figure 2 presents the publication trends of the field, making it evident that in 2023, researchers published the most on the use of AI for designing work. In 2019 and 2020, the number of publications grew suddenly, coinciding with the period when ChatGPT and other forms of affordable and accessible large-language models (LLMs) saw the light of day (Zhang & Parker, 2023).

Figure 2: Publication trend of the research topic



Source: Authors’ work

Hence, the last three years account for around 69% of the published literature in the entire research field. Yet, in the short chronological journey of the research field, some articles and scientific voices have stood out from the rest. Namely, the most cited articles are presented in Table 1. Most of the journals

where these publications can be found are in the areas of management, management of information systems, human resource management, applied psychology, information technology, and similar.

Table 1: Most cited articles in the research field

Authors	Title	Year	Source title	Cited by
Huang M.-H.; Rust R.; Maksimovic V.	The Feeling Economy: Managing in the Next Generation of Artificial Intelligence (AI)	2019	California Management Review	267
Mendling J.; Decker G.; Reijers H.A.; Hull R.; Weber I.	How do machine learning, robotic process automation, and blockchains affect the human factor in business process management?	2018	Communications of the Association for Information Systems	144
Parent-Rocheleau X.; Parker S.K.	Algorithms as work designers: How algorithmic management influences the design of jobs	2022	Human Resource Management Review	101
Leyer M.; Schneider S.	Decision augmentation and automation with artificial intelligence: Threat or opportunity for managers?	2021	Business Horizons	53
Korhonen T.; Selos E.; Laine T.; Suomala P.	Exploring the programmability of management accounting work for increasing automation: an interventionist case study	2021	Accounting, Auditing and Accountability Journal	48
Wilkens U.	Artificial intelligence in the workplace – A double-edged sword	2020	International Journal of Information and Learning Technology	45
Sampson S.E.	A Strategic Framework for Task Automation in Professional Services	2021	Journal of Service Research	44
Qiu H.; Li M.; Bai B.; Wang N.; Li Y.	The impact of AI-enabled service attributes on service hospitableness: the role of employee physical and psychological workload	2022	International Journal of Contemporary Hospitality Management	42
Langer M.; König C.J.; Busch V.	Changing the means of managerial work: effects of automated decision support systems on personnel selection tasks	2021	Journal of Business and Psychology	41

Source: Authors' work

Based on the most influential publications, researchers have analyzed the impact of Industry 4.0 and Industry 5.0 technologies on the workplace and how these technologies can be used for segmenting tasks and allocating people (Mendling et al., 2018; Korhonen et al., 2021). Other authors have specifically analyzed the impact of (generative) AI, which is nowadays tasked with the analytical and thinking tasks as opposed to the emotional and strategic ones delegated to humans (Huang et al., 2019; Wilkens, 2020). Further, the most significant works in the field also look at the bigger picture of the impact of task automation, decision automation, and augmentation, as well as algorithmic management as a managers and HR professionals' tools for designing effective and quality jobs with the right person-to-job fitness (Sampson, 2021; Langer et al., 2021; Leyer & Schneider, 2021; Parent-Rocheleau & Parker, 2022).

Co-Authorship Analysis

In terms of authorship, the following co-authorship bibliometric technique mainly explores the publication dynamics across different countries. Illustratively, Table 2 brings together the countries with the most productive and most cited authors. The United States, Germany, Australia, and the Netherlands consistently appear in the top five, just in different positions based on the two criteria. Interestingly, while German authors have fewer publications, their citation performance makes them third in the world, while the opposite is true for Hindu authors.

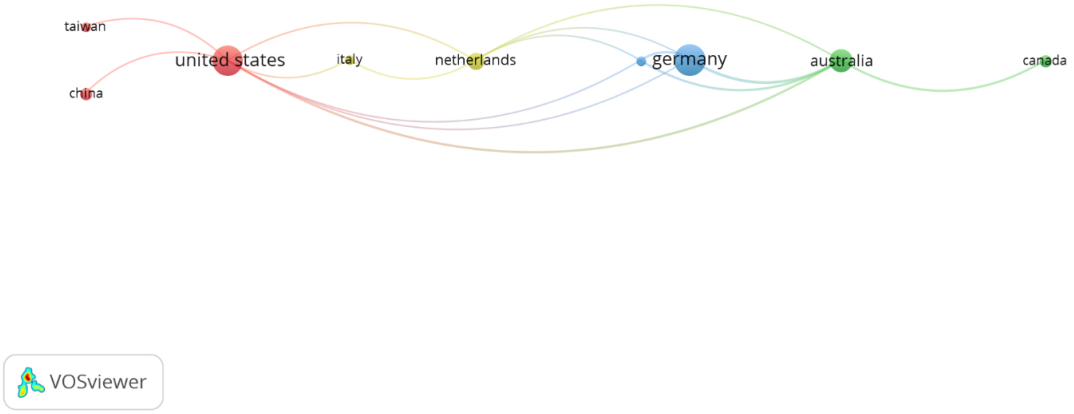
Table 2: Countries with the most productive and most cited authors

Country	Number of publications	Country	Total citations
Germany	16	United States	563
United States	15	Australia	356
Australia	9	Germany	339
India	6	Taiwan	267
Netherlands	5	Netherlands	210

Source: Authors' work

The network visualization map in Figure 3 displays the clusters of authors based on their mutual collaboration. Four distinct clusters emerge, and they are red, yellow, blue, and green – each with its own set of specific characteristics and sub-niches regarding AI use for job design purposes. Even though there is a cross-cluster collaboration (for example, U.S. authors work together with their Italian peers besides the ones from the cluster, such as Taiwan and China), mostly the research endeavors are a result of intra-cluster cooperation, such as the one between Australian and Canadian authors.

Figure 3: Country co-authorship network visualization map



Source: Authors' work

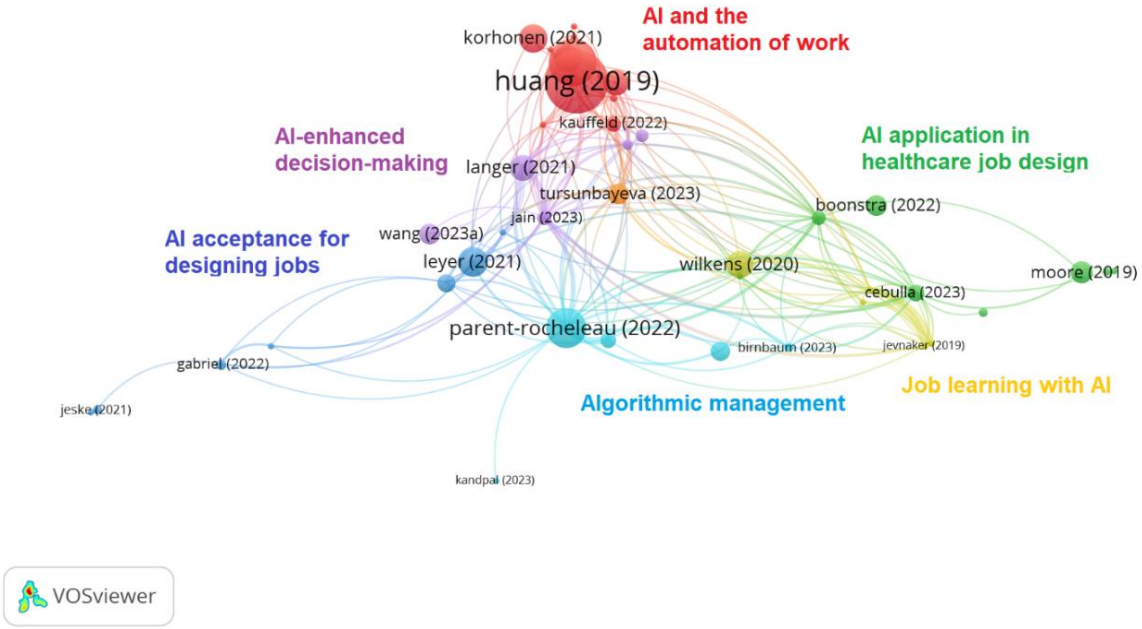
Still, when it comes to co-authorship between people, Huang M.-H., Rust R., and Maksimovic V. are the most cited authors, thanks to their foundational work with 267 citations. In this sense, the analysis proved that most authors collaborate among their own clusters and among their similar contexts, signaling a growing need for cross-country collaboration and a respectful translation of practices between regions.

Bibliographic coupling analysis

The next frequent bibliometric technique relates to bibliographic coupling. It aims to present the connections between publications based on the similarities between their respective references, coupling them based on the bibliography, which is where the technique got its name (Van Eck & Waltman, 2017).

As Figure 4 demonstrates, Huang, Parent-Rocheleau, Langer, and other related authors dominate in this aspect, too. These authors and their work consistently appear in the reference lists of the other foundational works in the research field. The clusters in the bibliographic coupling map reflect the time dynamics, too, with the violet and orange clusters representing newer additions in the scientific discourse as opposed to the red cluster, which brings together the earlier, most notable works.

Figure 4: Map of bibliographic coupling



Source: Authors' work

The six distinct clusters are in line with the keyword co-occurrence clusters, which will be explained in more detail further in the article. Hence, the map shows that despite the freshness of the field, researchers have started tackling various aspects of the use of AI for designing and redesigning jobs as we know them. From the obvious effect of AI integration, which is increased job automation (Korhonen et al., 2021) to an enhanced, swifter decision-making process with new alternatives (Langer et al., 2021), the research field also contributes to the broader picture of algorithmic management and algorithmic HRM, considering different industries, among which healthcare is prevalent currently (Boonstra & Laven, 2022).

Keyword Co-Occurrence Analysis

One of the crucial aims of bibliometric analyses is the identification of hotspots and common themes in the literature, which is usually achieved with network visualizations based on a co-occurrence technique. We used the same sample size for extracting the key terms to get to the map, which links together different terms, separated into distinct clusters. Namely, the larger the bubble and its corresponding term are, the more frequently it appears; the closeness of the terms is based on whether they are researched together (Zupic & Čater, 2015).

We performed full counting on keyword data from the 67 articles, setting the minimum number of occurrences to three for each keyword. 288 original keywords met the threshold. Afterward, the rule of thumb for this type of analysis suggests that 60% of them are the most relevant (Van Eck & Waltman, 2017), so after manually assessing the relevance of each keyword, we developed the network visualization map presented in Figure 5. This map links 119 keywords, divided into five thematic clusters, each represented with a separate color. The map boasts 943 links and a total link strength of 4951.

The keywords that lead the scientific discourse on AI use for designing jobs from the lens of organizational science are presented in Table 3, showcased with the number of occurrences, links, and their total link strength.

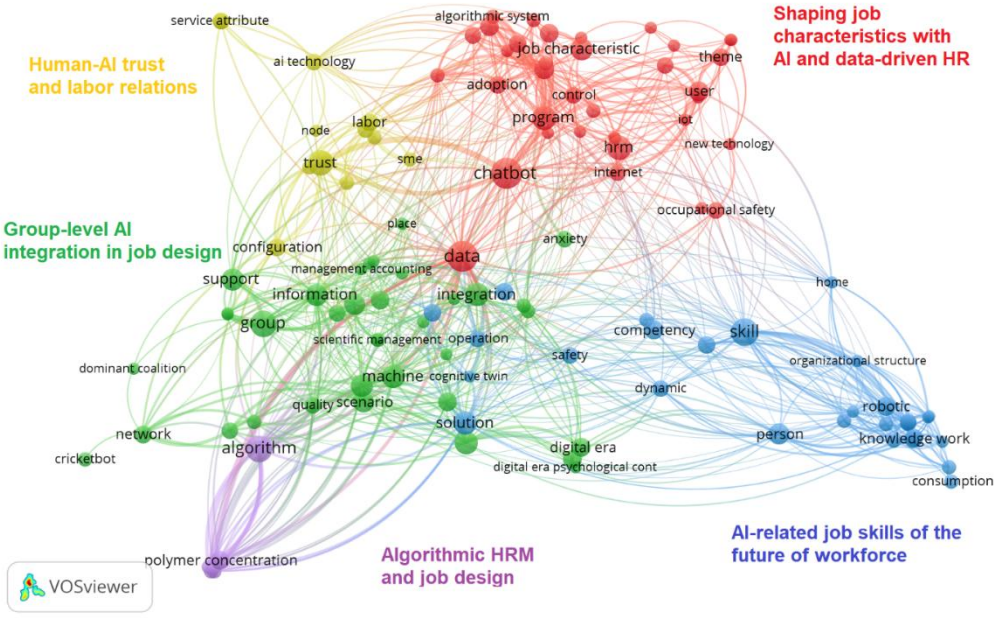
Table 3: Most impactful keywords

Keyword	Occurrences	Links	Total link strength
data	20	57	368
chatbot	20	22	270
skill	15	49	173
algorithm	14	29	302
group	14	23	191
trust	13	11	198

Source: Authors' work

Scientific discourse so far has paid great attention to generative AI through chatbots, assisting HR professionals and employees in designing their jobs. Connected to this, powerful algorithms are increasingly driving the organizational engine forward in digital organizations, impacting groups and then individual workers. One of the other prominent research areas is related to skills, which is part of the larger debate of whether and which jobs AI can potentially replace. Yet, contemporary research findings suggest that AI can be just a powerful tool, and employees who understand it and have the necessary AI skills can be the ones to potentially replace the employees who do not use this technology (Eng et al., 2024).

Figure 5: Network visualization map of keyword co-occurrence



Source: Authors' work

Red cluster "Shaping job characteristics with AI and data-driven HR". This cluster encompasses 36 items, out of which, the ones that dominate are also mentioned before as the most occurring ones overall. Namely, they are 'data' and 'chatbot' with 20 occurrences each. They are closely linked to other terms such as 'HRM' and 'program', appearing 12 times each, as well as 'job characteristic' (10 occurrences), 'user' (eight occurrences), 'experience' (eight occurrences), and more. It has been noted that chatbots and AI can boost flexibility for the operational members of the workforce, reduce work constraints, eliminate tasks, and create a fresh task redistribution when it comes to aiding the job design activities of HRM (Flandrin et al., 2021; Wang et al., 2023).

Green cluster "Group-level AI integration in job design". Sharing the same cluster size as the red cluster, the green cluster delves deeper into the group level of AI adoption, with the following keywords leading the pack. 'Group' occurs 14 times, followed by 'integration' (11 occurrences), and 'support', 'volume', 'combination', 'machine', and 'information' each appear ten times. Research endeavors champion a socio-technical system approach when designing entire work systems to consider organizations' mission

statements and the input of the employees who are a part of this system (Gabriel et al., 2022), while at the same time focusing on flexibility and self-management (Kauffeld et al., 2022).

Blue cluster "AI-related job skills of the future of the workforce". The blue cluster consists of 28 distinct keywords. 'Skill' (15 occurrences) and 'person' (9 occurrences) dominate this cluster, which focuses on the individual AI aspect of work design. These keywords are in turn connected with similar ones such as 'competency', 'solution', 'knowledge work', 'organizational structure', 'sustainability', and more. It was found that AI applications can find a place in the administrative activities of healthcare professionals, related to their job design, autonomy, control, skillset, social relations, and job demands (Tursunbayeva & Renkema, 2023). This also transfers to other knowledge work and knowledge-intensive industries (Jevnaker & Olaisen, 2022).

Yellow cluster "Human-AI trust and labor relations". Comprising 13 key terms, this cluster of research raises the question of trust or human trust in the AI software that is capable of taking over some job design duties and crafting new organizational structures. The keywords with the highest occurrence are 'trust' (13 occurrences), followed by 'labor' and 'configuration' appearing six times. Other keywords include 'SMEs', 'AI technology', and similar. Hence, findings point out that configurations in the organizational structure to accommodate human-AI teams may likely lead to greater trust and better clarity of roles, while the potential distrust towards AI may result from the division of tasks (Jain et al., 2023).

Violet cluster "Algorithmic HRM and job design". The smallest cluster links six items, turning the attention to algorithms in HRM. Computer intelligence has been found to aid the job design of jobs in the oil industry (Mohaghegh et al., 2000) and other manufacturing-related jobs. Yet, researchers note some risks associated with including AI in existing jobs as this may lead to a heightened level of monitoring and tracking employees, making this situation ideal for micro-management, workplace anxiety, and stress (Moore, 2019).

Discussion and Future Research Directions

Discussion

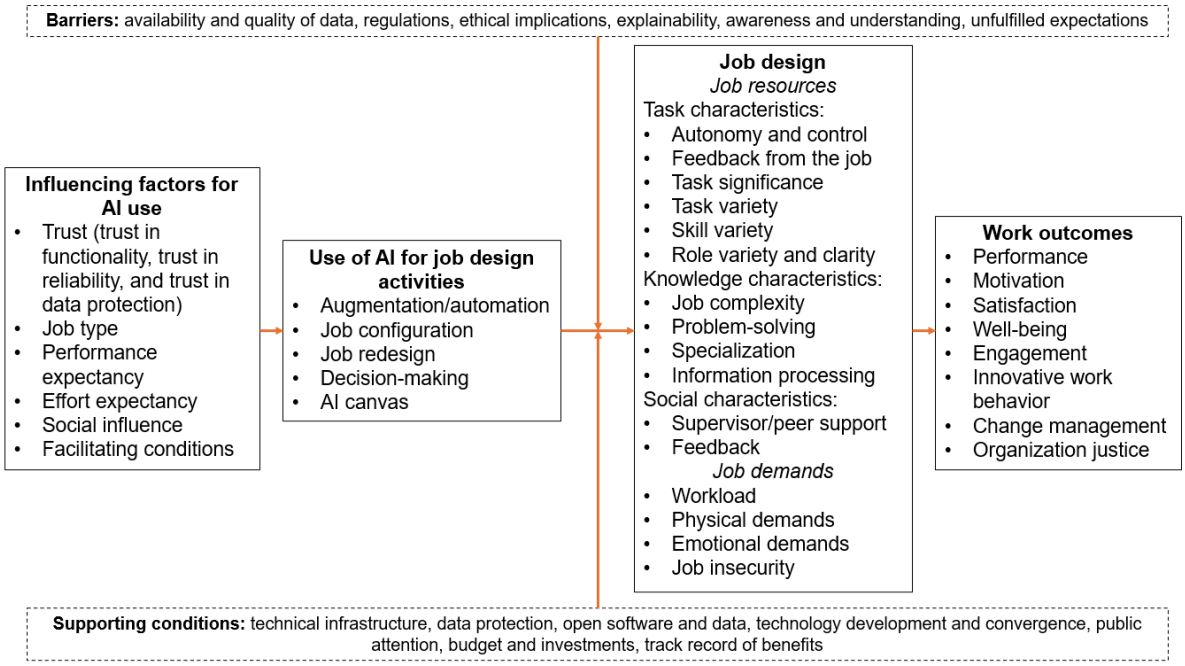
The study represents one of the first bibliometric analyses in the field of AI adoption in job design. We found that around 69% of the research on the topic was published in the last three years, signaling the potential for further growth. Huang et al.'s (2019) work on the use of generative AI for operational tasks as well as emotional ones is the most cited article of writing this article. Furthermore, authors from the United States, Germany, Australia, and the Netherlands are the pioneers when it comes to both productivity and citations.

We identified several key themes that encompass the use of AI for work design. We see this impact on a group level with firm-focused AI integration in this HR function and an individual level concerning the job characteristics and skills of the workforce. Additionally, other themes concern employees' trust towards their AI "colleagues" and how tasks are delegated among these two types of co-workers. With algorithmic management on the rise, it does not come as a surprise that AI is used for creating tasks and shaping job characteristics, job demands, job resources, and, thus, entire organizational structures (Boehmer & Schinnenburg, 2023). This is in line with the work by Pennathur et al. (2024), who identify worker characteristics and the rise of technology use for administrative work as imminent trends.

Moreover, the first industry that started applying AI for job design activities was healthcare, where hospitals and healthcare providers use technology for nurse rostering and aligning employee schedules (Tursunbayeva & Renkema, 2023; Boonstra & Laven, 2022) as well as in the tourism sector where the characteristics of AI-enabled services impact the hospitableness (Qiu et al., 2022) and other service-based industries (Çalli & Çalli, 2022). Later, it spread to knowledge-intensive work, technology, recordkeeping and accounting, and more (Jevnaker & Olaisen, 2022; Franken et al., 2023; Korhonen et al., 2021). This supports and builds upon the findings of other reviews which identify that technology-intensive and service-oriented industries were the first to adopt AI (Kaushal et al., 2023).

As with other strategic HRM functions, job design brings with it various concepts that are likely to be impacted by the implementation of AI (Figure 6). To begin with, having trust in the technology, the type of job, as well as factors like performance and effort expectancy, the influence from the surroundings and the peers, and other facilitating conditions (Wang et al., 2023, Eftimov & Kitanovikj, 2023), can influence whether managers or HR professionals may decide to use such technology. On this note, once this technology is used, researchers point out that this technology's applications balance between job design automation and job design augmentation, with capabilities of restructuring and configuring jobs so that some tasks and some extents of decision-making are delegated to automated machines (Parent-Rocheleau & Parker, 2022). As such, this completely transforms the job resources and job demands of jobs, with some jobs being more human-reliant, whereas some would be partially or completely automated. This process is hindered or aided by certain barriers and facilitators, which often exist outside of the job design activities and are related to the internal organizational culture and resources or outside social factors (Tursunbayeva & Renkema, 2023).

Figure 6: Conceptual themes for advancing job design through AI



Source: Authors' work based on Jain et al. (2022), Cebulla et al. (2023), Verma & Singh (2022), Wang et al. (2023), Tursunbayeva & Renkema (2023), Eftimov & Kitanovikj (2023), Fréour et al. (2021), Parent-Rocheleau & Parker (2022)

In turn, these job resources and demands have implications for workplace outcomes, whether on an organizational or individual level. Thus, these complex relationships can improve or worsen performance, satisfaction, engagement, innovative work behavior, organizational justice, and more (Fréour et al., 2021; Cebulla et al., 2023; Verma & Singh, 2022).

Considering this, the research field notes some theoretical and practical implications. Theoretically, for one, researchers have attempted to analyze the use of AI for job design purposes through the lens of the resource-based view (RBV) theory, as one of the most reputable and credible HR theories. Boehmer and Schinnenburg (2023) view this technology in the context of HRM as a way to enhance organizational capabilities as crucial resources that drive competitiveness and individual employee outcomes. Connected with obtaining new capabilities, the individual and organizational learning theory has been used to describe how job characteristics and tasks can be transformed through learning under the impact of AI (Wilkens, 2020). Additionally, Gabriel (2022) argues for a theory of justice for AI in the context of the modern workplace, meaning that some norms should exist in terms of the application of AI systems; these norms refer to public acceptance and justification, support for basic human rights,

and promotion of fair outcomes at work and outside of the professional lives of the employees, which enters the domain of work design.

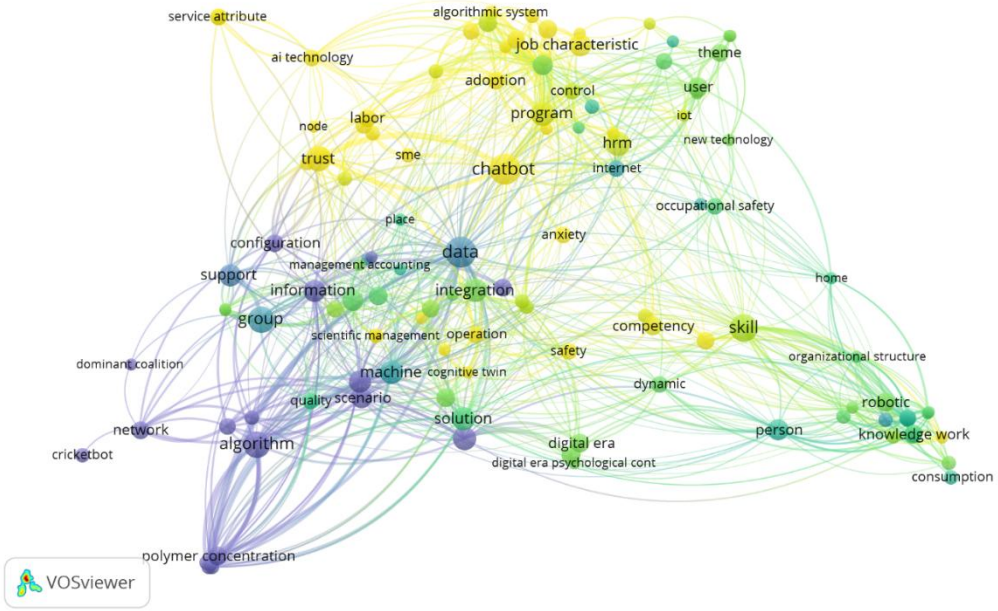
In terms of the practical implications, the study underlines the need for bringing HR professionals, managers, and policymakers to the table. Each of these actors can significantly make changes in their respective domains, while decision-makers are focused on regulating the use of AI and safeguarding the ethical considerations, HR professionals and business leaders can use the findings to consider the potential factors and barriers that can help or slow down their digitalization processes. This signals the need for a strategic approach to using AI for job design, which would also require employees' acceptance, too.

Future Research Agenda

Researchers highlight the positive aspects of embedding AI in the job design process in terms of task delegation, flexibility, reliability, and more (Kauffeld et al., 2022), yet some negative aspects are also prevalent in the form of increased monitoring and tracking of employees as well as workplace anxiety, and stress (Moore, 2019). This leaves a lot of space for further exploration of the research field and the interplay of different constructs and impacts related to AI and job design.

To develop the agenda for future research, we developed an overlay visualization map (seen in Figure 7), presenting the connected keywords based on the time-sensitive dynamics, i.e., based on their popularity during the last five years. This means that if a keyword is yellow or light green, it has recently become the focus of scholars.

Figure 7: Overlay visualization map of keywords in the last five years



Source: Authors' work

Based on that, we can see that the terms 'chatbot', 'trust', 'algorithmic system', 'job characteristic', 'competency', 'safety', 'scientific management', and similar are trending now and will likely continue to do so in the upcoming period. As a result, we suggest seven pathways for future research, which are presented in Table 4.

Table 4: Proposed future research agenda on the use of AI in job design

Future research directions	Sources
Longitudinal studies on AI's impact on job evolution over time and in different contexts (Global South and Global North as well as Global East and Global West) can be fruitful for researchers.	Tursunbayeva & Renkema (2023), Bhargava et al. (2021)
Employees' psychological impact of AI-defined job roles, such as stress, acceptance of AI, and perceived loss or enhancement of creativity in their work.	Theis et al. (2023), Parent-Rocheleau & Parker (2022)
Ethical and practical implications of using AI to customize job roles based on employee data, such as performance metrics, personality traits, and career aspirations, which are crucial inputs in the job design process.	Cahill (2022), de Sio (2024), Biondi et al. (2023)
Assessment of whether AI-driven job design tends to increase or decrease job complexity and task variety, as well as the impact on workload distribution.	Verma & Singh (2022), Hughes (2019)
The relationship between AI-driven job design and different job characteristics and demands, like autonomy and skills, and competencies.	Berretta et al. (2023), Verma & Singh (2022), Boehmer & Schinnenburg, 2023
The impact of AI-mediated job crafting on multiple work outcomes, such as employee satisfaction and engagement.	Tursunbayeva & Renkema (2023), Boonstra & Laven (2022), Bhargava et al. (2021)
How can human HR professionals and AI systems collaborate effectively in job design activities, referring to the role of trust and transparency between HR managers and AI tools?	Wang et al. (2023), Glikson & Woolley (2020)

Source: Authors' work

Regardless of whether one supports or disapproves of the use of AI in management and the organizational decision-making process, undeniably, it is the implementation and usage of AI itself, that may result in positive or negative outcomes and not the technology per se.

Research Limitations

This bibliometric study is also not free of some research limitations, which can be further addressed by other researchers in the future. For one, the study relies on data from Scopus, while other scholars may expand the analysis with data from other databases such as IEEE. We acknowledge that searching only the Scopus database may constitute a limitation, yet this choice was made deliberately because Scopus offers exceptionally broad, high-quality coverage of the literature most relevant to AI-enhanced job design, which was suitable for us to detect the highest-quality research works while setting aside the grey literature. Scopus is widely regarded as the "world's largest abstract and indexing database, indexing tens of thousands of peer-reviewed journals across science, technology, medicine, management, and social sciences (Schotten et al., 2017). Empirical comparisons reinforce Scopus's comprehensiveness, with findings pointing out that Scopus covers roughly 20% more content than Web of Science and spans a broader range of journals (Falagas et al., 2008).

Additionally, besides applying multiple bibliometric techniques, which are more quantitative and offer a more bird's-eye point of view of the literature, there is still a dose of subjectivity in analyzing the articles, which is characteristic of all literature reviews. Furthermore, bibliometric analyses are burdened with investigating citations, which means that sometimes older articles have the advantage, considering that there is a long period for an article to become more known and impactful in the field, neglecting some of the more recent works, which are still very relevant, especially minding the recent, very rapid changes in generative AI. Hence, it may remain unclear why a certain author chose to cite one particular piece of research.

Conclusion

In conclusion, the digital transformation brought on by artificial intelligence is profoundly impacting job design, creating both opportunities and challenges for human resource professionals and managers. This study provides a comprehensive synthesis of the state-of-the-art literature on AI's application in job design through a robust multi-technique bibliometric approach, followed by a literature review adhering to PRISMA guidelines.

While there have been significant publication contributions in the past, this research field is still characterized as emerging, as evidenced by the fact that about 69% of the research on the subject has been published in the previous three years. As of the time this article was written, Huang et al.'s (2019) study on the use of generative AI for both operational and emotional tasks is the most referenced article. Moreover, in terms of production and citations, writers from the United States, Germany, Australia, and the Netherlands are the leaders.

Analyzing 67 Scopus-indexed publications allowed us to identify significant themes, such as the effect of AI on job characteristics, group-level AI integration, future job skills, trust, and labor relations in the context of human-AI interactions, and the role of algorithmic HRM in job design. Our findings highlight the emerging focus areas and underscore the critical intersections between AI, job roles, and the evolving expectations of the workforce. Furthermore, we propose seven research pathways for future exploration, aimed at addressing the knowledge gaps and advancing the discourse on leveraging AI for job design.

Regardless, as one of the first bibliometric analyses in this emerging field, our work not only contributes to identifying the core literature themes for the scientific community but also provides a foundational understanding to guide future research and practices in HRM and job design amidst AI integration for practitioners and managers.

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