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The potential of artificial intelligence adoption for managerial decision making: A rapid literature review

1. Introduction

The rapid development of Artificial Intelligence (AI) technologies has undoubtedly changed the landscape of business, with increased interest in it also being seen in academia. The popularization and extensive interest in its potential, especially related to language-based communication, have made many professionals fearful of the consequences for their jobs. AI has tremendous potential for the replacement of human-conducted tasks in a wide range of business, intellectual and even social applications (Dwivedi et al. 2021). It promises a leap forwards, in a manner akin to the introduction of machines replacing physical workers during the Industrial Revolution. AI not only poses challenges to the way enterprises operate, introducing new work methods, and workplaces but also from the perspective of enterprise management. While there is a general sense of optimism, albeit mixed with legal and ethical problems, the application of AI in management is referred to as being limited to routine decisions (Feuerriegel *et al.*, 2022). In the work of M. Sieja and K. Wach (Sieja, Wach 2023), the clusters of opportunities of **generative artificial intelligence** are related to automated content generation, new product design, optimisation of workflows, customer experience, and data synthesis. Only a few works analyse the strategic level of research focus which is set also by V. Ratten (Ratten 2024) as a future research agenda. There is no information on how AI could help a manager make better decisions and if it is possible to "replace" the manager in this task. As at the moment we speak in academia about an AI spring (Arsenyan, Piepenbrink 2023) it is important to raise the question: "How can managers benefit from this technology?".

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AI is presented as a candidate to improve decision-making in organizations by the better analytical capabilities it can supply and which leads to valuable insights from big data. In turn, this could lead to more informed decisions being done in less time (Shick et al. 2023). AI systems can collect and organize data, analyse it, and offer decision alternatives (Prasanth et al. 2023). By the automation of receptive tasks, AI has more time for strategic planning and also prioritised soft skills in managers' work (Mkhize et al. 2023), representing a change in the profile of a future manager. On the other hand, there are survey results where workers strongly believe that "robots will one day replace their managers" (Schawbel 2019). The main work of a manager is to effectively use resources to achieve goals (Nićin et al. 2018; Tovmasyan 2017). They are responsible for planning, organizing, motivating, and controlling the activities within the organization (Tovmasyan 2017). In general, managers primarily engage in the efficient utilization of resources, decision-making and enhancing organizational value through their actions and choices (Chapman 2001).

Taking into account some concerns about the use of AI in management and beyond, the overall purpose of the work is to indicate the possibilities of using AI to support an enterprise's decision-making processes. The article raises the following explanatory research questions:

RQ1: In what ways does AI support managers for decision-making purposes?
RQ2: How do current studies highlight the potential future application of AI for decision-making purposes?

The primary focus of the article will be on the rapid literature review and exploring the directions of research development within the analysed context, aiming to highlight the practical opportunities that can impact a manager's work.

2. Research methodology

The conducted study employs a rapid literature review (Smela et al. 2023) done systematically. This stage aims to answer the question of what are the primary applications of artificial intelligence in the context of management and decision-making (RQ1) and also to find the potential of future AI utilization for purposes strictly related to managerial decision-making (RQ2).

Before starting a rapid systematic review the initial graphic analysis of keywords related to AI study in the context of management was done with the use of the Scopus database and the search: "artificial intelligence" and "management" for the newest data were conducted (Fig. 1). The search was limited to the years

2010–2024 and to articles and conference materials in English within the fields of Business, Management, and Accounting. The study allows distinct four clusters of topics based on keywords within the broader context of AI and management. The first cluster encompasses main categories such as economics, finance, and management science, highlighting the foundational aspects of AI applications. The second cluster explores specific topics directly related to machine learning, risk management, and the development of big data and Industry 4.0, illustrating the intersection of AI with contemporary technological advancements. The third cluster focuses on the relationship between AI and broadly described algorithms and optimization models. It emphasize the diverse applications of AI across various computational frameworks. The fourth and prominently visible cluster revolves around decision-making support systems, indicating a central theme in the management application of AI models.

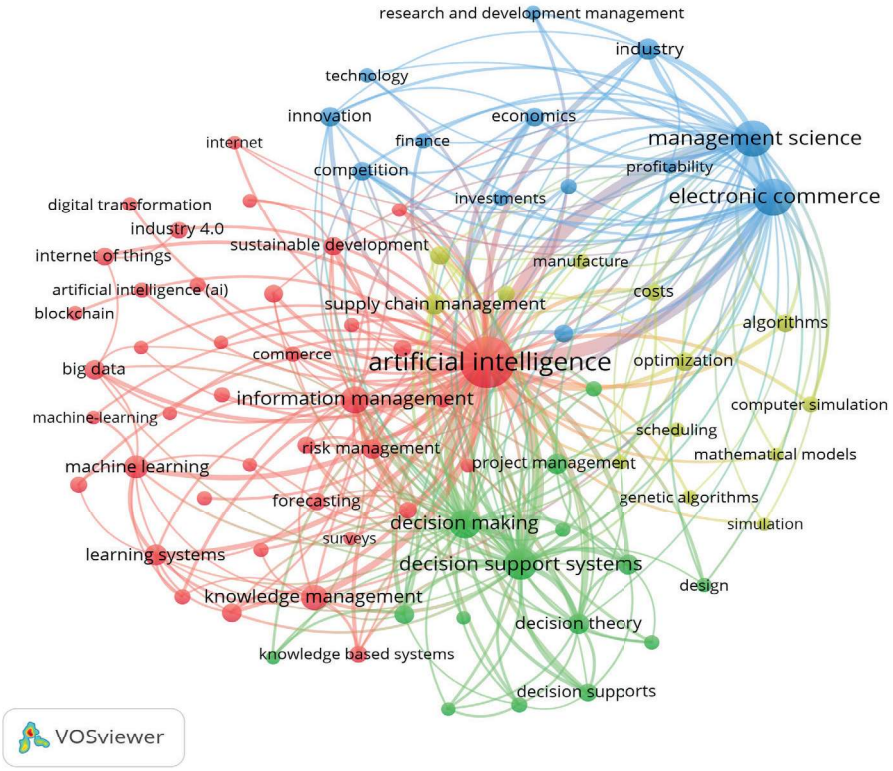

Figure 1. Visualization of keyword connections in the literature on artificial intelligence in management

Taking into consideration the popularity of the topic and the number of papers related to artificial intelligence, the decision was made to focus on the latest works which are literature reviews. Taking into account the results presented in Figure 1 it is justified to include two keywords for systematic literature review: "decision making" or "decision support". An additional requirement regarding the quantity of citations was introduced to ensure that only significant academic works were included. Given the widespread interest in the topic and the need to synthesize key elements, such a strict constraint will help emphasize the most significant and widely explored research directions. Subsequently, the received papers underwent selection based on a thorough examination of the topics addressed by the authors in this article. A presentation of the subsequent steps of rapid systematic review and the number of results can be found in Table 1.

Table 1

The subsequent steps of a rapid systematic literature review and the number of results

Review steps	Number of results	
	Scopus	Web of Science
1. Results for: "artificial intelligence" AND "management" and "decision making" OR "decision support"	15097	7993
2. Limited to English language and years 2020–2024	4989	4408
3. Limited to: "Business, Management and Accounting" (Scopus) „Management" and „Business" (WOS)	570	469
4. Narrowing to literature reviews and open access	16	27
5. More than 10 citations	8	15
6. Number of literature reviews with no duplicates	22	
7. Number of literature reviews after abstract verification	8	

3. Literature review

The first analysed paper is the review done by R. Costa et al. (Costa et al. 2020) where the focus lies on the understanding of the impact of AI tools on the development of business functions. The findings within the work suggest that AI tools are commonly utilized by commercial managers and play a supportive role in their functions. The findings underscore the significant impact of AI systems on

the professional development of commercial managers, enabling better decision-making and fostering improved customer relationships.

The second examined work highlights the potential benefits of incorporating machine learning (ML) in information systems research (Abdel-Karim et al. 2021). ML is presented as a solution for a potential increase in the relevance of findings. Based on a literature review and a survey of information system researchers, an assessment was conducted to understand the reasons behind the limited adoption of ML methods. One of them is a deficiency in understanding it. This may block researchers from familiarizing themselves with and applying these methodologies. At the same time, a lack of understanding leads to a reduction in confidence in the reliability of the results obtained by ML.

The study of Z. Doborjeh et al. (Doborjeh et al. 2022) aims to review and analyse established AI methods in the tourism sectors while also identifying their applications in these industries. It proposes personalized AI modelling for smart tourism platforms to enhance decision-making processes. By emphasizing the importance of utilizing appropriate AI algorithms and interdisciplinary technologies, the paper provides decision-makers with insights into selecting suitable AI approaches. It is done mainly by the use of AI for predicting tourism choice behaviour patterns more accurately.

The next examined paper, by R.E. Bawack et al. (Bawack et al. 2022), provides a comprehensive bibliometric study and review of the research of AI in e-commerce. It emphasises that this area focuses on recommender systems. Key research themes include sentiment analysis, trust, personalization, and optimization. It suggests that firms aiming to leverage AI in e-commerce needs to hold ownership of customer data specialized AI algorithms, and proficiency in analytics which cannot be easily imitated by their competitors. The research underscores the importance of these discoveries for managers, emphasizing the opportunity to improve recommender systems' quality by integrating tailored AI algorithms that optimize, personalize, establish trust, and analyse sentiments.

The fifth review examined explores the growing role of people analytics in organizations and its impact on decision-making processes (Giermindl et al. 2022). The study places significant importance on the potential of learning algorithms to enhance decision-making by providing more reliable and superior outcomes in contrast to human decision-making. Autonomous analytics stands apart from other systems due to its capacity for continuous learning and adaptation with each use. As a result, it increases precise estimations and evaluations. Unlike traditional deterministic processes, algorithms in this category are not strictly predictable or repeatable. While descriptive, predictive, and prescriptive analytics supplement decision-making, autonomous analytics operates at a higher level by autonomously driving decision-making processes, including the execution of

tasks and entire workflows, thereby reducing the need for human intervention. This shifts decision-making authority from humans to AI-enabled systems, allowing autonomous analytics to substitute humans in decision-making processes entirely. The paper urges for thorough research to comprehend the adverse effects and guarantee the future of work and human decision-making influenced by people analytics.

The next paper raises the question of supply chain resiliency post-COVID-19 in which effective decision-making plays a vital role. In the context of this review the article does not offer valuable implications as the main result in it is a proposition for further investigation of "the enablers of a sustainable supply chain and propose an AI-based decision model to overcome the challenges that occur due to pandemics" (Naz et al. 2022).

The research conducted by B. Rolf et al. (Rolf et al. 2023) acknowledges decision-making as a high-complexity process in the context of supply chain management. The primary application of reinforcement learning (related to AI and ML) in supply chains is inventory management, given its crucial role in synchronizing supply chain processes. This underscores the significance of inventory management as a central area due to its pivotal role in synchronizing the supply chain processes. Inventory management and transportation planning are highlighted as examples of short-term tasks which "require frequent and fast decision-making". It's an important part of the design of the supply chain that influences the success of the company. In this field managerial-level decisions play a key role and support by AI is crucial to foster competitiveness in this sector.

The last analysed work of G. Giuggioli and M. Pellegrini (Giuggioli, Pellegrini 2023) is the recognition of four advantageous consequences of artificial intelligence (AI) on entrepreneurship: empowering novel prospects, amplifying decision-making, ameliorating efficacy, and expediting education and inquiry in entrepreneurial undertakings. The paper emphasizes how AI enhances decision-making processes for entrepreneurs by enabling better predictions and, consequently, more informed and effective decisions. It serves well especially when AI enables entrepreneurs during the opportunity recognition phase of the entrepreneurial process.

In summary, the results do not identify specific applications directly related to decision-making. Analysed works focus on the supportive role of AI (Costa et al. 2020; Giermindl et al. 2022; Giuggioli, Pellegrini, 2023), especially through the increased relevance of findings with the use of big data analysis (Abdel-Karim et al. 2021). It allows for forecasting possible future scenarios, and preparing decision proposals (Giermindl et al. 2022). AI shows potential, especially in data-driven decision-making (Rolf et al. 2023). It is evident from the literature that AI enables more informed and effective decision-making by providing better predictions and insights, ultimately

empowering entrepreneurs and decision-makers across diverse sectors. AI will become an important asset for tourism (Doborjeh et al. 2022), e-commerce (Bawack et al. 2022), supply chain management (Rolf et al. 2023) and many others. Responding to RQ1: "In what ways does Artificial Intelligence (AI) support managers for decision-making purposes?" it is noteworthy that the primary way is to make managers more informed due to improved predictions resulting from AI implementation (Giuggioli, Pellegrini 2023). So, it's important to note that in current research, AI primarily supports analysis processes. However, there is still the necessity for further development of AI technologies (Costa et al. 2020).

Surprisingly, the highlighted works do not provide a clear answer to RQ2, which necessitates indicating potential future applications of AI for decision-making purposes. There is a need for further research focused on future applications of AI in decision-making beyond the current support in providing more accurate information, also focusing on quicker decision-making processes.

4. Discussion

Criticism and discussion regarding the results may primarily be linked to the use of the rapid review method. The author intended to select the most popular journals, and it is possible that the latest studies were not included due to the requirement of 10 citations. Such a limitation allowed to find key and recognized trends in the research. However, additional review of the abstracts of papers rejected by this selection does not allow for the conclusion that results regarding the answer to RQ2 would have been found.

It seems that the main reason that stops the presence in research is the lack of understanding of AI, coupled with the limited ability to hold AI accountable for decisions made (Abdel-Karim et al. 2021). It's difficult to imagine a scenario where, under legislation, the owner of AI would be held criminally responsible. This poor ability to hold AI accountable is one of the problems in the Harvard Business Review report but the same report indicates that 78% of surveyed managers believe that they will be able to trust the advice of intelligent systems in making decisions (Feuerriegel et al. 2022). Such high results primarily stem from the widespread popularity of AI as a tool for delegating administrative tasks. This would allow the manager to focus on judgment and assess the potential of the proposed solutions, taking into account the history and culture of the organization. The human factor would therefore be responsible for empathy and reflection on the ethics of undertaken actions. Since, according to the study, more than half of managers at various levels of the organization spend more than half of their time on administrative and control tasks – freeing this time would also allow for

the design of new solutions in the enterprise and the development of the social network around the entity (Kolbjørnsrud et al. 2016). Nevertheless, AI adoption is well-known for its problems with reliability, verification and the interpretation of results obtained through ML as well as any standardisation of its usage (Abdel-Karim et al. 2021).

From the methodological point of view, researchers must identify what they mean by AI. Even this paper includes numerous terms such as Machine Learning and Information Systems, which are directly related to AI but may not necessarily be strictly focused on it. It is important to differentiate between different types of AI used in their studies to avoid ambiguity (Bawack et al. 2022).

Other challenges are related to the dimension of the sensitive and personal data. It challenges the ethical implications of allowing it to be analysed by an AI system (Giermindl et al. 2022). Ethical problems are also widespread on the issue of increasing moral inequality triggered by the decision-making process of AI. This has the potential to a reduction in ethical decision-making options (Villegas-Galaviz, Martin 2023). Here again, arises the issue of transparency in the AI evaluation process. It is important to ensure that AI decisions are understandable and justifiable to those impacted by them (Milian, Bhattacharyya 2023).

Referring to the lack of an indication in the papers of an answer to RQ2, this could be judged a surprising result, especially given the hopes placed on AI by managers. Nevertheless, AI is expected to play a crucial role in decision-making in the future. The ability to process vast amounts of information and complex situations is a promising aid . However, its absence necessitates further investigation.

5. Conclusions

This study delves into the role of AI in supporting managerial decision-making processes, addressing two key research questions: (RQ1) In what ways does AI support managers for decision-making purposes? (RQ2) How do current studies highlight the potential future application of AI for decision-making purposes? The answer to both questions was investigated by a rapid literature review. The results show that AI doesn't replace managers but offers substantial opportunities to mitigate their workload. The answer to RQ1 is that the most popular use of AI is in support activities. AI enables more informed and effective decision-making by providing better predictions and insights. This is the basis for decisions to be made. This signifies the promising role of AI in enriching decision-making processes and fostering innovation and efficiency within organizations. Because of that, AI is an important topic in research in the context of computer science, business, and management as based on ecommerce (Bawack et al. 2022). However,

regarding the RQ2, despite the prevailing optimism regarding AI's potential, the review underscores a lack of clear indications concerning its future applications in decision-making beyond its current supportive function. This indicates a deficiency in understating and projection of further trajectory of AI's influence and predicting its changing role and consequences.

This study contributes to the range of rapidly developing AI literature with an overview of the most promising possibilities for using AI in a manager's work. As businesses in a volatile and uncertain world should navigate the complexities, understanding AI advantages and possibilities may be considered essential for staying competitive by enabling the potential of technological innovation in the realm of business management. The study conducted is a rapid literature review, which has its limitations. While it quickly provides answers to the research question, which aligns with the exploratory nature of the study, there is a possibility that significant works related to the chosen topic may have been missed.

The study reveals some future research directions. The main one is related to the investigation of potential future applications of AI for decision-making purposes. It should consider the advancement in AI technology and trends in the adoption of it. Another research can address the challenges associated with AI implementation, ways to ensure accountability and ethical AI use in decision-making processes. It would also be interesting to pursue an investigation of the effectiveness of AI-driven decision-making systems on examples of different organizational contexts. Another intriguing research question for further research are stated in the work of R.E. Bawack et al. (Bawack et al. 2022): How is AI affecting managerial mindsets and actions in e-commerce? Of course, the question is also important from the point of view of other areas than e-commerce. The research directions could focus on investigating the intersection of AI with business goals and strategies, addressing the lack of attention given to this area in academic literature (Rajagopal et al. 2022).

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Summary

The article aims to investigate how Artificial Intelligence (AI) can support managers in making decisions. The methodology employed for this purpose involves a rapid literature review process. It is done in two stages that involve the graphic analysis of keywords, the systematic manner for rapid literature review and a directed search through online scientific article databases in pursuit of answers to the research questions. As a scientific basis for article selection, Scopus and Web of Science were chosen. The study indicates that AI supports decision-making processes by providing managers with more informed insights and predictions because of high data analysis capabilities. However, there is a lack of clear indication regarding the potential future applications of AI for decision-making purposes other than a supportive role. The study highlights the importance of AI in managerial decision-making processes. It particularly enhances analytical capabilities which led to the improvement of decision outcomes. It also stressed out the need for further research on future applications of AI in managerial decision-making contexts. The main concerns tackled challenges related to its adoption, such as reliability, accountability and ethical considerations.

This article contributes to the literature by conducting a rapid literature review of the current state of research of AI applications for managerial decision-making. It highlights gaps in research on the future of AI for decision-making and emphasizes the need for additional research in this area.

JEL codes: M10, M19

Keywords: *artificial intelligence, decision-making, decision-support*