

Artificial intelligence in managerial decision-making: A systematic review of applications, constraints, and emerging tensions

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Abstract---The use of artificial intelligence (AI) in managerial decision making is now common practice in strategic, tactical, and operational decision making and literature on this topic is scattered over fields, industries, and decision contexts. The aim of this systematic literature review is to demonstrate how previous scientific research studies have played a part in the managerial decision-making process, its outcome, and the organizational dynamics of the process, and to highlight the remaining challenges that hinder the effective use of AI. The review focuses on the use of machine learning, predictive analytics, and decision-support systems in the past decade, based on peer-reviewed research articles, to improve forecasting accuracy, combat cognitive bias, and facilitate complex managerial judgments (Jarrahi, 2018; Davenport & Ronanki, 2018). Meanwhile, the results show persistent issues with data bias, transparency, explainability, and the excessive dependence on the algorithmic output by the manager, which hinders accountability and trust in the decisions made with the help of AI tools (Rai et al., 2019; Shrestha et al., 2021). This review builds on a thematic framework that synthesizes management, information systems, and organizational theory perspectives relating AI capabilities to decision levels and human–AI interaction modes. The study makes a contribution by going beyond a focus on efficiency, and by focusing on the role of the manager as an interpreter, evaluator, and governor of the insights generated by AI. The review ends by identifying gaps in the research and suggesting future research in the area of responsible and context-sensitive, human-centric AI for managerial decision-making.

Keywords---Artificial intelligence, managerial decision-making, AI Applications.

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1. Introduction

In the past, managers have been making decisions based on experience, judgment and situational awareness to deal with uncertainty and organizational complexity. In the last 10 years, this age-old approach to human discretion has been supplemented by AI systems which have the capacity to analyse vast amounts of data, discover patterns and make predictions. From strategic management and market prediction to operational control and performance assessment (Davenport & Ronanki, 2018), AI is now integrated into various managerial functions and tasks. Consequently, today's organizations do not require a human decision maker but require a hybrid decision making, in which the intelligent system and the manager affect one another. While researchers increasingly report on the use of AI decision support, the scientific research published on its use in managerial settings is inconsistent and often contradictory. The studies are often focused on gains in efficiency, speed and accuracy, and frequently AI is seen as a tool that enhances decision quality by processing data more effectively, with little consideration of its potential impact on the nature of the decisions themselves (Brynjolfsson & McAfee, 2017). Other streams of research, however, point out that many factors, including cognitive, social, and organizational, are in play when managers make decisions, and that these factors are not necessarily overcome by AI and could even be exacerbated in some instances (Jarrahi, 2018). There are concerns about the lack of explainability, the lack of accountability, a lack of trust, and overreliance on automated recommendations, which can lead to loss of managerial judgment (Rai et al., 2019).

On a theoretical level, the use of AI in managerial decision-making put some existing assumptions of decision theory and organization behavior into question. The classical rational approach assumes that improved information results in improved decision making, while the behavioral approach emphasizes heuristics, biases, and the importance of context in decision making. The new rationality that AI systems offer is data driven and probabilistic, and frequently inaccessible to human users. This is a conflict between human sense making and algorithmic reasoning, especially in situations with high stakes or ambiguity, where managerial sense making and ethical judgment are still important (Shrestha et al., 2021). This dynamic is crucial for evaluating not just the impact of AI on decision-making, but its implications for the managerial role and its responsibilities. While there are a number of reviews about the adoption of AI, digital transformation, or analytics capabilities at the organizational level, there has been little synthesis that explicitly focuses on managerial decision making as a stand-alone evolving practice. Previous reviews are technology-focused or policy-oriented, providing general, high-level overviews and lacking systematic links between the applications of AI and individual decision levels, managerial activities, and the dynamics of human-AI interaction. This non-integration poses challenges to deriving meaningful and coherent conclusions about where AI brings benefit, where it brings risk and how managers change their decision behaviours in response.

The background of the present study is the systematic review of the literature to understand the current practice of AI in managerial decision making and the challenges that come with it. The purpose of the review is to integrate empirical and conceptual studies from management and information systems and organizational studies to build a structured understanding of AI-based decision support. In particular, it aims to answer three questions that guide the use of AI technologies: across what types of decision contexts are AI technologies used (strategic, tactical, and operational); what kinds of benefits and outcomes in performance are reported; and what kinds of limitations, ethical concerns, and human factors can hinder effectiveness. This review provides an integrative and theory-informed synthesis that helps address management scholarship by providing a clearer picture of the changing nature of the role of a manager in an AI-enabled organization and directions for future research on responsible and human-centred decision-making in an AI-enabled organization.

2. Conceptual Foundations

To appreciate the relevance of the AI for managerial decisions, the discussion must be based on well-founded decision theories and related to the unique strengths of modern AI systems. In traditional studies of managerial decisions, it has been investigated both in a rational and in a behavioural perspective. The rational decision-making models suggest that, in the presence of adequate information, managers are able to analyse options systematically and choose the optimum options. The bounded rationality approach, on the other hand, focussed on the fact that, because of limited cognitive capacity, time pressure and imperfect information, managerial decisions are not made optimally but rather based on the use of heuristics and satisficing (Simon, 1955). These viewpoints continue to be key in understanding the dynamics of managers' interactions with AI-driven decision-making tools. Another aspect of behavioral decision theory is the role of biases, feelings, and social factors in managerial decision making. Even well-experienced managers have been found to be prone to systematic mistakes like overconfidence, anchoring and confirmation bias in uncertain and complex settings. Empirical studies reveal that the most experienced managers are prone to systematic errors, especially in uncertain and complex environments, such as overconfidence, anchoring error and confirmation error. Such an AI system is frequently described as the corrective system that can oppose these biases by using to pattern recognition data and not intuition (Kahneman, 2011). This, however, assumes that AI-generated content is accurate and trustworthy, which may not be the case if AI is fed with biased or incomplete data.

In terms of technology, AI applications in managerial roles generally involve machine learning algorithms, predictive analytics, AI-driven expert systems, and natural language processing applications. While classical decision support systems were based on fixed rules and static models, modern AI systems are adaptive and can adapt to new data. This capability enables AI to make probabilistic recommendations, forecasts, and classifications to help guide management decisions in areas like strategy, marketing, finance, and operations (Davenport & Harris, 2017). However, these outputs are probabilistic, which can diminish the transparency of the process, and make it hard for managers to understand or explain the process of generating these recommendations.

This human-AI connection creates a hybrid decision-making ecosystem that combines human and algorithmic intelligence. AI-inspired decisions are no longer made by managers alone but by managers as interpreters and evaluators of the generated information. Research into the effective use of AI in decision-making has also shown that the quality of the decisions depends on the degree of trust, questioning and contextualizing that managers have in the AI suggestions (Jarrahi, 2018). Trust can sometimes become excessive, resulting in an automation bias, while skepticism can adversely affect the value of AI assistance. The use of AI in management can be related to the various decision levels in a conceptual way. Strategic decisions are typically of the "long-term", highly uncertain, and in a qualitative nature, which makes it difficult to be fully automated but makes it possible to be supported by AI for scenario analysis and forecasting. These decisions are more data-driven and structured, like where to allocate resources or set prices, and are better suited for AI-assisted optimization. Operational decisions are usually made over and over again and are rule-based; AI can be more autonomous in this case. This difference offers a helpful prism for structuring and understanding the vast body of literature on managerial decision-making with the help of AI. The review builds on the conceptual basis of combining decision theory with AI capability perspectives, rather than considering AI as only a technical tool, but rather as a powerful participant in the managerial decision system. This perspective facilitates a deeper understanding of the implications of AI on decision-making, authority dynamics, and managerial responsibilities in various organizational settings.

3. Review Methodology

This study follows the systematic literature review (SLR) methodology to enable the structured and transparent synthesis of the research on A.I. in managerial decision making. The selection of a systematic review was deemed suitable due to the proliferation of AI-related research in fields such as management, information systems, and organizational studies, along with the aim of synthesizing the fragmented results and insights into a cohesive knowledge. This method allows for a repeatable process in identifying, evaluating, and interpreting existing knowledge and reduces selection bias (Tranfield et al., 2003), as opposed to narrative reviews. To assure academic rigor and uniformity, the review was limited to peer-reviewed, English-language journal articles. Key management and information systems databases were searched such as Scopus, Web of Science and ScienceDirect. The databases were chosen for their ability to provide a wide range of high impact journals and interdisciplinary research into AI, Analytics, and Decision Making. The search strategy included a combination of keywords to cover the different variations of the concepts that included “artificial intelligence,” “machine learning,” “decision support,” “managerial decision-making,” and “management judgment.” Boolean operators were used to capture relevant variations.

A large number of articles were obtained initially, and subsequently screened through several stages. In the first phase, the titles and abstracts were examined to filter out the studies that were purely technical algorithm design, operational level automation and not involving decision making, or managerial aspects of the algorithm design with no technical contribution. The second stage involved a full text screening to evaluate the conceptual fit, methodological clarity and applicability to managerial decision scenarios. The studies were included when they specifically investigated applications of AI that were intended to inform, facilitate or affect managerial decisions at strategic, tactical, or operational levels. To ensure consistency and quality, conference papers, editorials and practitioner reports were excluded. The selected articles underwent a thematic synthesis analysis after the review. The studies were coded according to the decision level, type of AI used, domain of application, reported benefits and identified challenges. This was an inductive coding process that allowed for identification of common themes and patterns in a variety of contexts (Braun & Clarke, 2006). The synthesis focused on the 'interpretative integration' and not on the statistical aggregation, in line with the conceptual and methodological diversity of the literature. The review process is systematic and transparent; however, there are some limitations which should be noted. The emphasis on research published in English-language journals could lead to the omission of pertinent research findings from other languages, and new research studies could be developed during the time frame between the publication of the review and the time of the presentation. Despite this, the methodology offers a solid base to build a comprehensive picture of the influence of AI on managerial decision-making and gaps in the existing literature.

4. AI Applications in Managerial Decision-Making

In the literature, various areas of artificial intelligence are presented that can assist managers in decision making at different levels in the organisation. AI systems do not replace managerial judgment but are primarily tools to complement the decision-making process with the support of data-driven insights, forecasts, and recommendations. AI's role and influence on decision-making can range from simple to complex, depending on the degree of decision-making authority given and the level of structure within the task. In the strategic dimension, the main use of AI is to aid in long-term and highly uncertain decision making. Studies highlight the use of machine learning and advanced analytics in strategic forecasting, market trend analysis, and competitive intelligence. AI systems can analyze vast and diverse sets of data, such as market reports, customer information, and unstructured textual data, helping top management to highlight opportunities and risks that emerge in the data (Davenport & Harris, 2017). But whether a decision is made to automate completely or not will sometimes be a matter of ambiguity, ethics and politics, and this will only add to the need for human interpretation of AI-generated insights.

Another aspect where AI usage is more prominent is in tactical decision-making. AI-powered decision support systems are being adopted by middle managers for resource allocation, pricing strategies, marketing campaign optimisation and coordinating supply chains. These situations are semi-structured, and can use predictive and prescriptive analytics to test several scenarios, real-time and instantaneously. AI-informed tactical decisions can also enhance efficiency and consistency, especially in settings where there is a high volume of data and consistent patterns (Wamba et al., 2017). However, the impact of AI in this stage largely relies on the quality of data and the managerial skills of making sense of algorithms' results. On the operational side, AI is often integrated into the day-to-day and repetitive decision-making processes. They are used in scheduling employees, managing inventory, checking quality and monitoring risk. In these instances, AI systems can work in a more autonomous way, initiating actions or providing recommendations with minimal human involvement. This may decrease the time required to make decisions and the expenses of operations, but may also lead to loss of situational awareness and less human control over operations when systems are faced with novel or unexpected conditions (Parasuraman et al., 2000). The application of AI in managerial decision-making is further influenced by the sectoral differences. AI is widely utilized in manufacturing for prediction, forecasting, predictive maintenance, and process optimization. In finance, applications are based on money-lending, fraud detection, and investment decision support. Retail and marketing research studies focus on personalization, dynamic pricing, and customer analysis, whereas studies in the public sector are focused on the use of AI for policy analysis and resource planning. The differences highlight this point of non-uniformity and that the adoption of AI is a matter of data environments, regulatory frameworks, and decision cultures within industries.

The literature suggests that AI-based managerial decision-making tools work best when they are in line with the structure of the decision and the organization's context. Artificial Intelligence systems are not decision makers, but they are powerful inputs that affect the way managers collect information, consider options, and make decisions. This nuanced insight serves as a stepping stone toward studying the advantages and results of managerial decisions made with the help of AI.

5. Benefits and Performance Outcomes

Much of the literature highlights that artificial intelligence can be useful in improving the managerial decision making process. At various stages in decision-making and in all sectors of the industry, AI has become a part of the decision-making process. In decision-making processes and in all industries, AI is most often linked with faster decision-making, deeper analysis and uniformity. AI systems can work with a massive amount of complex data and deliver predictive and prescriptive insights, thus moving away from descriptive reporting to help managers make more informed and timely decisions (Davenport & Ronanki, 2018). This is especially important in complex situations where decisions are made late or based on trial and error can lead to loss of competitiveness. A common one is enhanced decision making. In the case of high-dimensional data, machine learning models and predictive analytics are able to discern patterns and relationships that may not be clear to human decision-makers. Empirical studies have shown that in many aspects like demand forecasting, credit assessment, and risk analysis, AI-driven decisions have been more impactful than traditional human judgment, resulting in improved resource utilization and fewer mistakes (Wamba et al., 2017). The benefits of these gains are best seen in the structured and data rich contexts, where there is a reliability of patterns, which can be tapped.

Another key outcome is related to the mitigation of cognitive bias on managerial judgement. Managers have been shown to suffer from systematic error in their behaviour from behavioral research, especially in times of uncertainty or information overload. With well-designed and well-governed systems, AI can be a debiasing tool, providing alternative ideas and findings that can counter intuitive judgments (Kahneman, 2011). Nevertheless, there are also warnings in the literature that the reduction of bias is dependent on the neutrality and representativeness of training data, which may amplify or propagate

inequities when the data they are constructed from is biased. The use of AI is also correlated with improved managerial productivity and organization responsiveness. AI helps managers save time on data analysis, routine decision-making, and collection by automating such tasks. Some research has also indicated that this transition enables managers to spend more time on interpretation/sense making, and not on manual analysis, which can improve the quality of the decision at the organizational level (Jarrahi, 2018). Furthermore, AI-based systems can facilitate continuous learning, adapting recommendations over time as new data is acquired, for more adaptive decision-making. While these advantages have been highlighted, literature has underlined that the results of the interventions are not always positive. The benefits of AI in decision-making are influenced by how ready an organization is, how well it manages data, how skilled the managers are, and how well the AI's capabilities match the decision's needs. If these conditions are not met, the performance increase envisioned might not come through or might even result in less than optimal performance. The conflicting results suggest that it is imperative to explore the potential difficulties and limitations of using AI in managerial decision-making scenarios.

6. Challenges and Constraints

While the literature has consistently identified the benefits of using AI in managerial decision-making, it has also pointed to various challenges that hinder the effective use of AI. The benefits of using AI in managerial decision-making have been well documented, but there are also several challenges that have been identified. Availability and quality of data is one of the major and discussed constraints. AI systems rely on extensive, precise, and representative data sets, but managerial decisions can be based on incomplete, noisy, or specific data. Research indicates that bad data quality can cause the recommendations to be inaccurate, lack managerial confidence, and result in wrong decisions (Rai et al., 2019). Where this occurs, AI doesn't remove uncertainty, it might just make it more difficult to see. The issue of algorithmic bias is another important one. AI models that are trained using historically biased or unbalanced data can perpetuate inequities in areas like hiring, promotion, credit approval, and performance evaluation. This is especially an issue in managerial decisions, where fairness, legitimacy and moral responsibility are key. The literature stresses that there is a high risk of bias in AI systems, as the decision logic can be difficult to understand, and, when it is, may be impossible for managers to question and correct the algorithmic outcomes (Mehrabian et al., 2021).

Other limitations that arise are transparency and explainability. AI models are often 'black boxes', especially more advanced deep learning systems, which give little insight into how the model generates the recommendations. This lack of explainability makes it hard for managers who are responsible for decisions and results to build trust, explain and learn. In managerial settings, research shows that managers are more likely to adopt AI when they can explain and justify its advice, highlighting the significance of the explainability besides the predictive capability of AI (Shrestha et al., 2021). A common issue is the potential for relying too much on AI-generated recommendations. In some cases, when managerial judgments and the context of a situation are paramount, automation bias can arise when managers rely too heavily on the algorithmic output. This inclination can hinder critical thinking and diminish managerial skill development in the long-term. At the other end of the spectrum, certain research indicates resistance and lack of use of AI due to issues of loss of control, mistrust of AI, or inadequate analytical skills. These contrasting reactions stress the significance of management skills and company culture in affecting AI application (Jarrahi, 2018).

Lastly, ethical, legal and governance matters are serious limitations in managerial decision-making that are aided by AI. When decisions are made or influenced by Autonomous Systems, issues of accountability, data privacy and regulatory compliance become more complex. There are indications in the literature that, lacking clear governance structures, there is a risk of the delegation of decision-making to systems that are outside of the ethical and legal framework. All of this is a testament to the

fact that the application of AI in managerial decision-making is as much a socio-organizational problem as it is a technical one and demands design, control and assiduous evaluation.

7. Human–AI Interaction in Managerial Contexts

Crowley et al. (2017) state that the relationship between human judgement and algorithmic recommendations becomes a major issue in the literature as AI is integrated into managerial decision processes. The interaction between human judgement and the algorithmic recommendations becomes an important issue in the literature as AI becomes integrated into the managerial decision process (Crowley et al., 2017). Most studies of decision making do not see AI as a substitute for humans, but as a pair of systems that both employ reasoning human reasoning and AI-based reasoning that are complementary. This change has several implications for the concept of managerial role, role authority and role accountability in organizations. A key insight is the changing nature of managers from decision makers to decision orchestrator. In an environment supported by AI, managers are more likely to think about the problem, define goals, and analyze the results than to come up with solutions themselves. AI systems offer analytical depth and pattern recognition, and managers offer contextual understanding, ethical judgment, and strategic sense-making. To optimize the quality of their decision-making, managers need to be direct in their interaction with the AI outputs, challenging assumptions, validating results, and incorporating the knowledge of the organization (Jarrahi, 2018).

Trust is a key element in human–AI interactions. It is suggested in the literature that blind faith is not the most successful and neither is constant scepticism. Managers are more likely to utilize AI as a valuable contribution when they trust it in a suitable manner and don't turn over the reigns. But other elements like the transparency of the system, its success track record and the extent to which the AI-generated suggestions seem to align with management instincts play a role in the development of trust. Explainable AI tools are demonstrated to facilitate trust by allowing managers to grasp the rationale of advice, helping them make informed decisions on accepting or rejecting recommendations from AI (Rai et al., 2019). Another crucial aspect of the interaction between humans and AI is accountability and responsibility. Often managers are ultimately responsible for these even if AI systems provide recommendations or make some decisions. This is problematic when AI recommendations clash with a manager's decision-making or organizational practices. Clear responsibility divisions have been identified as a key factor to avoid defensive decision making or overly relying on algorithms to deflect blame. Having clear roles and governance bodies are thus crucial to make sure that AI does not reduce managerial accountability (Shrestha et al., 2021).

Also cited in the literature are changes in managerial autonomy and managerial skill requirements. Although AI can increase managerial capacity by supplying more information, it could also reduce autonomy due to the rigidity of parameters in algorithms when taking decisions. The managers must gain new skills like data literacy, critical assessment of the output of algorithms and ethics in situations that involve AI. These are the type of capabilities that are essential in decisions that are somewhat ambiguous or high-stakes and where human judgment is still essential. Human–AI interaction for managerial decision-making is essentially a two-way street relationship that is dynamic and evolving. AI support can only work so well when managers understand, believe and leverage algorithmic insights in their decision-making processes. This view will help to consolidate and find wider trends in the applications of AI and managerial challenges.

8. Synthesis and Thematic Framework

Based on the literature reviewed, the findings show that there is no single dominant theme in the literature regarding the use of AI in managerial decision-making, but instead there are various interrelated themes. In all studies, AI is represented as a relevant input that influences managerial decision making, but in some cases the effect of AI is different based on the characteristics of the

managerial decision process, the organizational environment, and the type of interaction between humans and AI. These aspects combined provide a more comprehensive insight into the impact of AI on managerial decision-making processes. The first big theme is the matching of the capabilities of AI with decision level. The literature suggests that AI is most valuable in situations of structured and semi-structured decisions, in which previous data and patterns can reliably predict and optimize. As such, tactical and operational decisions are found to be the focus of empirical studies, and strategic decision making is less explored because it is less certain and is based on qualitative judgment. This imbalance indicates that the utilization of AI in strategic managerial decision-making is still more about augmentation than replacement, serving more as a tool for analysis and support to managerial decisions rather than as a replacement for managerial thinking. The second theme has to do with outcomes of performance and their conditionality. Many studies have found the accuracy, speed and consistency to be improved but this is not guaranteed. Data quality, organizational preparedness, and managerial skills to understand the results of AI are essential for positive outcomes. In the absence of these, AI systems can perpetuate existing biases, stifle critical thinking, or give a sense of certainty when it is warranted. The discovery contradicts the deterministic perspective on AI-driven changes in performance and highlights the significance of socio-organizational aspects.

A third overarching theme is human–AI interaction. Trust and skepticism in AI recommendations are noted as influencing decision quality in the literature. In the literature, decision quality is influenced by a mix of trust and skepticism with respect to the recommendations from AI. The process of effective interaction is characterized by active sense making and transparency and shared accountability, while ineffective interaction is associated with automation bias or resistance. This theme emphasizes that AI cannot be considered stand-alone but should be viewed as a part of managerial cognition, organizational norms and power structures. Based on these concepts, this review suggests a thematic framework, which connects the capabilities of AI, the level of decision-making and managerial results by mediating the HAI. AI technologies can deliver analytical inputs with different levels of autonomy and complexity, decision levels and the extent of the influence of AI on the decision-making process, and managerial engagement can lead to better decision quality or create new vulnerabilities. The framework underscores the importance of issues like bias, explainability, and accountability as intrinsic processes that impact the efficacy of AI in managerial settings. This synthesis brings together and synthesizes the scattered pieces, taking the research beyond any single application or capability. It lays the groundwork for future research on creating more context-sensitive and human-centred approaches to AI-supported managerial decision-making and for identifying and addressing gaps in the field.

9. Research Gaps and Future Directions

In spite of an explosive growth of literature on the use of artificial intelligence in managerial decision-making, some gaps can be identified. There is a notable drawback in this: most of the studies are cross-sectional and short-term. Most empirical studies measure AI application at a single point in time, limiting their ability to provide a snapshot of the evolution of managerial use and/or decision behavior over the course of adopting intelligent systems. Longitudinal studies are required in order to understand the learning effects, path dependency and the potential deskilling and reskilling of managers over time. The second gap in the literature relates to the lesser focus on context. The current research focus is in large companies and these companies that rely on data like the financial sector, manufacturing and retail. Small and medium-sized enterprises, and public sector and emerging economy contexts are underrepresented. The decision making processes in these environments may vary significantly based on factors such as resources, regulations and culture. Therefore, future research should design comparative and cross-cultural approaches to gain insight into the impact of context on managerial decision-making with the help of AI.

The literature further shows that there is no theory-driven integration. Although there are numerous studies reporting on the performance outcomes or adoption factors, not many studies have provided

explicit connections between AI use and any existing theories of decision-making or organization. This restricts the extent of knowledge development and generalisation of findings. Future studies might further develop theory by explicitly linking the use of AI in decision making to theories of bounded rationality, sense making, institutional change, and managerial cognition. Another unexplored area is ethical and governance issues. Issues of bias, transparency and accountability are often recognised, but sometimes seen as a secondary, rather than key, question for research. Further empirical studies are needed into the ways in which organizations structure governance processes, delineate responsibilities, and address conflicts between algorithmic recommendations and human judgment. Experimental and qualitative methods can be especially useful in elucidating these dynamics. Lastly, there is limited methodological diversity. The quantitative survey type of design is more frequently used in comparison to qualitative, experimental, and mixed-method designs. Future studies might benefit from detail case studies, field experiments and simulation-based approaches that are able to incorporate the complexities of the real world decision environment. Filling these gaps will further enhance the comprehension of AI in managerial decision-making, and help to create more responsible, transparent, and human-centric AI systems.

10. Managerial and Policy Implications

This review has important implications for managers and policy-makers in the field of integrating AI into decision-making. The results of this review have several important implications for managers and policy makers in the field of integrating AI into decision-making processes. The evidence indicates that for managers, the use of AI should not be seen as a decision-making entity but rather as a decision-supportive entity. The active involvement of managers in framing the problem, interpreting the output, and evaluating the recommendations is essential for effective use of AI. While some believe AI is a replacement for managerial judgment, others see it as an analytical tool that can improve decision-making and managerial learning, potentially introducing a layer of accountability when relying on AI. A need for managerial capability development is identified. AI-driven decision-making requires new skills in managers, such as data literacy, analytical thinking, and ethical consciousness, according to the literature. Training programs, thus, should not only train students on technical skills but also on questioning algorithms, identifying possible bias, and combining AI and contextual/ experiential knowledge. These are particularly important when it comes to making high-stakes or ambiguous decisions, where human judgment is still a must.

Governance is pivotal in influencing the outcomes of AI from an organizational standpoint. The clarity in data quality, model validation and decision accountability can minimize risks that can be faced due to bias, opacity and misuse. There should be transparent systems in place to answer the questions behind the recommendation and provide easy-to-understand feedback to managers, allowing them to make informed decisions about accepting or rejecting AI recommendations. Having multi-disciplinary oversight teams with managerial, technical and legal expertise can further enhance the use of AI responsibly. The review highlights the importance of regulating for innovation but accountability for policymakers. Policies need to foster transparency, fairness and explainability in the face of a growing role of AI in managerial decisions involving social and economic implications, yet not overly restrict the experimentation in the organizational context. Guidelines that are industry-specific might be especially impactful because the sensitivity of the data to the decision risk varies by industry. In summary, the takeaways indicate that the effectiveness of the use of AI in managerial decision-making is not necessarily linked to the sophistication of the technology, but rather to careful alignment of systems, people and governance. Both managers and policymakers can ensure that AI plays a role in more informed, ethical, and resilient decision processes by focusing on building human-centered designs and clear accountability.

11. Conclusion

The aim of this SLR was to investigate the role of AI in managerial decision-making, focusing on its applications, benefits, and challenges. The review indicates that the use of AI is now beyond the point of being experimental or peripheral; it is now being adopted as a strategic, tactical and operational decision making tool. Instead of taking the place of managers, AI acts as a powerful aid to decision-making that changes the way information is managed, options are being considered, and decisions are being made. AI doesn't replace managers, it is a powerful decision making support system that alters the way decisions are made, options considered, and information managed. The results suggest that AI will be most useful when integrated with the nature and complexity of the decisions. Improvements in performance are clearly noticeable in decisions related to data and in routine decisions, but in strategic decisions and those with ambiguous information, human judgment is still the primary factor. Meanwhile, the review points to the highly conditional nature of the value of AI. Good data quality, transparency, managerial capabilities and governance structures are key pillars in shaping the impact of AI on decision quality. One important aspect of this review is to bring together the disjointed studies and present a holistic view, emphasizing human-AI interactions. The study's focus on the shifting nature of management as an interpreter and evaluator of algorithmic insights challenges the narratives of efficiency and highlights the socio-organizationality of algorithmic decision making. The suggested thematic structure explains the interplay between the capabilities of AI, the level of decision making, and managerial involvement, and their effects on the outcomes. To sum up, AI is not a magic bullet and it's not an inevitable danger to managerial decision-making. It is only with careful design, management and use that it has an impact. AI systems should incorporate elements of context sensitivity, transparency, and human oversight to complement managerial decision-making and ensure accountability and ethical considerations.

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