

The Dynamics of Human Collaboration and Artificial Intelligence in Managerial Decision-Making on the Transformation of Manager Roles in the Digital Era

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ABSTRACT

The development of Artificial Intelligence (AI) has brought significant changes to decision-making practices in modern organizations. Digital transformation is driving the emergence of new decision-making patterns that involve collaboration between human intelligence and machine intelligence in managerial processes. This research aims to analyze the dynamics of collaboration between humans and Artificial Intelligence in managerial decision-making and identify the transformation of managerial roles in organizations in the digital era. The research uses a qualitative approach with an exploratory design to deeply understand technology-based decision-making practices in organizations that are undergoing digital transformation. The research data was obtained through in-depth interviews, documentation studies, and literature reviews that were systematically selected using the PRISMA approach. The data is then analyzed using thematic analysis techniques to identify patterns of interaction between humans and Artificial Intelligence in the organizational decision-making process. The results show that the integration of AI in organizations does not replace the role of humans, but strengthens decision-making capacity through a collaborative system between algorithm-based analysis and human strategic considerations. This transformation also transformed the role of the manager from a single decision-maker to a facilitator who integrates information from digital systems with the context of the organization. This research emphasizes the importance of developing managers' digital competencies and implementing transparent Artificial Intelligence governance so that human and technology collaboration can support the effectiveness of organizational decision-making.

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1. INTRODUCTION

The digital transformation triggered by the rapid development of Artificial Intelligence (AI) has fundamentally changed the work patterns of modern organizations, particularly in managerial decision-making practices. In the context of the global digital economy, AI is no longer positioned solely as an automation tool, but has evolved into a cognitive partner that is able to help humans process complex information, identify data patterns, and provide decision recommendations based on predictive analytics. This phenomenon shows that organizational decision-making is now increasingly influenced by the interaction between human intelligence and machine intelligence, which together form a hybrid decision-making system. This shift marks a paradigm shift in management from a decision model based on human intuition to a collaborative model that leverages AI's computational capabilities to improve the quality of strategic decisions (Alam & Khan, 2024).

In contemporary organizational practice, the application of AI in managerial processes is not only limited to the analysis of operational data, but also begins to influence strategic decision-making that was previously dominated by human actors. Various global companies are utilizing AI technology to support decisions related to supply chain management, human resource management, and business strategy planning. The integration shows that AI is able to speed up the information processing process and improve the accuracy of predictions in an increasingly complex and dynamic business environment (Fernández-Vidal et al., 2022). This transformation also has an impact on changing the competence of managers, who are now required to have digital leadership skills and technology literacy to optimize the use of AI in organizational decision-making (Türk, 2023).

These developments are increasingly relevant in the context of the industrial revolution 4.0 and data-driven economy, where organizations face enormous volumes of information as well as high levels of uncertainty. In such situations, collaboration between humans and AI is becoming an increasingly important approach to ensure that organizational decisions remain rational and evidence-based. Research shows that the integration of AI in management is able to increase the effectiveness of data analysis, accelerate the process of evaluating alternative decisions, and support managers in dealing with the complexity of modern organizational problems (Akinagbe, 2024). Thus, AI acts as an augmentation tool that expands the cognitive capacity of humans in the decision-making process.

However, the application of AI in managerial decision-making also poses various conceptual and practical challenges. One of the key issues is how the relationship between humans and AI is built in the organization's decision-making process. Haesevoets et al. (2021) in a study entitled *Human-Machine Collaboration in Managerial Decision Making* showed that collaboration between humans and machines can improve the quality of decisions, but also raises trust issues with recommendations generated by algorithms. Managers often face a dilemma between following data-driven AI recommendations or maintaining professional intuition gained from organizational experience. This situation shows that collaborative decision-making between humans and AI does not always run in a linear fashion, but rather is influenced by psychological, organizational, and social factors.

On the other hand, Hao, Demir, and Eyers (2024) research entitled *Exploring Collaborative Decision-Making: A Quasi-Experimental Study of Human and Generative AI Interaction* shows that collaboration between humans and generative AI can produce more innovative decisions than decisions made individually by humans and AI. The findings confirm that the interaction between humans and technology has the potential to create cognitive synergies that improve the quality of decision-making. However, the research still focuses on experimental approaches so it does not fully explain the social and organizational dynamics that occur in daily managerial practices.

Meanwhile, Choudhary et al.'s (2023) research in the article *Human-AI Ensembles: When Can They Work?* emphasizing that the effectiveness of human and AI collaboration is greatly influenced by the design of organizational systems as well as coordination mechanisms between human actors and algorithms. The research shows that the success of human-AI collaboration is not only

determined by technological capabilities, but also by how organizations manage the interactions between the two. In other words, the managerial and institutional dimensions are important factors in determining the success of AI integration in the organization's decision-making process.

Another relevant research was conducted by Wen, Wang, and Chen (2025) through the article *Trust and AI Weight: Human-AI Collaboration in Organizational Management Decision-Making*. This study highlights that managers' level of trust in AI has a significant influence on the extent to which AI recommendations are used in organizational decision-making. When trust levels are low, managers tend to ignore AI recommendations even if they are backed by strong data. On the other hand, too much trust in AI can also pose a risk of algorithmic bias if managers do not conduct a critical evaluation of the results of AI analysis.

In addition to the technological aspect, digital transformation also encourages changes in the role of managers in organizations. In an increasingly digitized business environment, managers no longer play the role of a single decision-maker, but as a facilitator who integrates various sources of information, including the results of analysis generated by AI systems. Vasisht (2025) emphasized that organizational leadership in the era of digital transformation requires new skills in managing technology, data, and collaboration between humans and intelligent systems. This suggests that technological changes also have implications for the redefinition of managerial roles in modern organizations.

This transformation is also reflected in changes in management practices in various sectors of the organization. Sarbu (2025) shows that digitalization has encouraged organizations to develop more adaptive and technology-based managerial practices. In this context, AI serves as a strategic tool that helps organizations improve operational efficiency, accelerate data analysis processes, and support evidence-based decision-making. Therefore, collaboration between humans and AI is an important element in creating an organization that is adaptive to changes in the business environment.

Although various studies have examined the relationship between AI and managerial decision-making, most research still focuses on technological aspects or organizational performance quantitatively. Haesevoets et al.'s (2021) research emphasizes the psychological aspects of human-machine interaction, while Hao et al. (2024) examined the effectiveness of human collaboration and generative AI through experimental approaches. On the other hand, Choudhary et al. (2023) highlight more organizational design in AI integration. However, these studies have not explored in depth how the dynamics of collaboration between humans and AI shape the transformation of managers' roles in everyday organizational decision-making practices. In other words, there is still a limited understanding of how managers interpret, manage, and interact with AI in the context of real work.

Based on these limitations, this research has novelty in an effort to understand in depth the dynamics of collaboration between humans and AI in managerial decision-making through a qualitative approach. The study not only sees AI as a technology, but also as a non-human actor that influences cognitive and social processes in organizations. With this approach, the research seeks to uncover how the role of managers is undergoing transformation in an increasingly digitized work environment, as well as how the interaction between humans and AI is shaping new decision-making patterns in modern organizations. Therefore, the purpose of this study is to analyze in depth the dynamics of human collaboration and Artificial Intelligence in managerial decision-making and identify the transformation of managerial roles in organizations in the digital era.

2. METHOD

This study employs a qualitative approach with an exploratory research design to gain an in-depth understanding of the dynamics of collaboration between humans and Artificial Intelligence in managerial decision-making. The qualitative approach is chosen because the study focuses on exploring managerial experiences, perceptions, and practices within the context of organizational digital transformation. This approach enables a deeper investigation of how managers interpret the use of AI in decision-making processes and

how interactions between humans and technology influence organizational management practices in a contextual manner.

The sources of data consist of both primary and secondary data. Primary data are collected through in-depth interviews with selected informants who have experience in technology-based decision-making within organizations undergoing digital transformation. The informants are selected using purposive sampling based on specific criteria, namely holding managerial positions and having experience in utilizing AI-based systems in organizational decision-making. Secondary data are obtained from organizational documents, digital transformation reports, and relevant academic literature.

To strengthen the conceptual foundation, this study also adopts a systematic literature review approach using the PRISMA method. The literature search is conducted across several academic databases using keywords related to human–AI collaboration and managerial decision-making. The selection process involves several stages, including identification of articles, screening based on titles and abstracts, eligibility assessment through full-text review, and final inclusion of relevant studies.

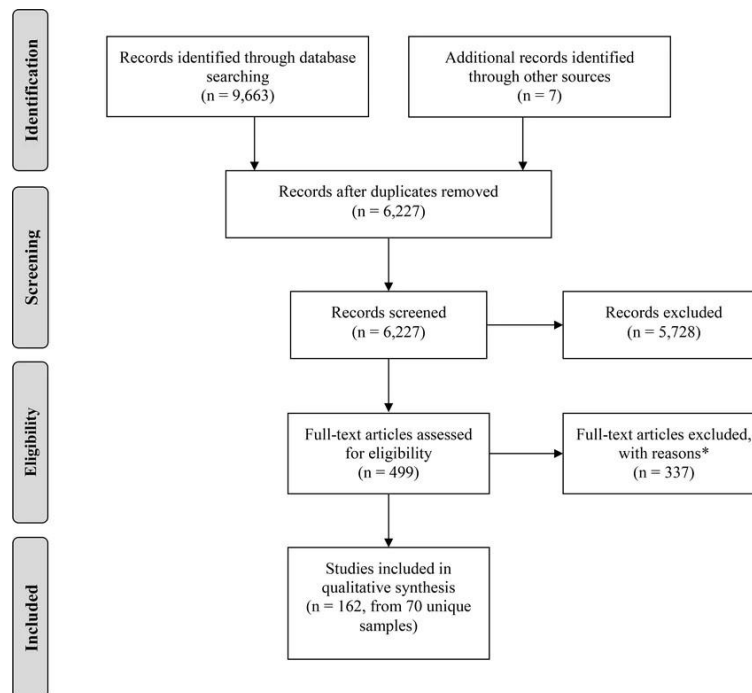


Figure 1. PRISMA Flow Diagram of Literature Selection Process

3. RESULTS AND DISCUSSION

The digital transformation that has occurred in modern organizations has brought significant changes to management practices, especially in the strategic decision-making process. Artificial Intelligence (AI) now not only functions as a data analysis tool, but also acts as a cognitive partner that supports the managerial decision-making process. This change has led to a shift in the manager's role from a single decision-maker to a coordinator who integrates the results of technology analysis with the organization's strategic considerations. In this context, AI acts as a decision support system that is able to process large amounts of data quickly and generate recommendations that can improve the quality of organizational decisions (Alam & Khan, 2024). The adoption of a qualitative exploratory approach in this study enables a deeper understanding of how human–AI collaboration unfolds in managerial decision-making within digitally transforming organizations. This approach is particularly effective in capturing the complexity of managerial

experiences, perceptions, and interpretations when interacting with advanced technologies. Prior research suggests that qualitative methods are highly suitable for examining how managerial competencies evolve and how organizations respond to digital transformation, especially in contexts that require adaptive and context-sensitive decision-making (Boateng & Olexová, 2025). In this study, insights derived from in-depth interviews demonstrate that managers do not merely rely on AI-generated outputs but actively interpret, evaluate, and contextualize them within organizational realities. This finding is consistent with previous studies emphasizing that effective use of AI in management depends not only on technological capability but also on the ability of managers to integrate data-driven insights with strategic judgment (Hillebrand et al., 2025).

Furthermore, the use of a systematic literature review following the PRISMA approach strengthens the analytical rigor of this research by ensuring that the findings are supported by credible and systematically selected academic sources. The integration of empirical data and literature synthesis allows for a more comprehensive analysis, as it combines real-world managerial practices with established theoretical perspectives. Previous studies highlight that such an integrative approach enhances the validity and robustness of research findings, particularly in studies addressing digital transformation and human–technology interaction (Hillebrand et al., 2025). In addition, the combination of primary and secondary data provides a holistic understanding of the phenomenon under study, where empirical evidence from organizational contexts is reinforced by theoretical insights from the literature. This approach aligns with earlier research indicating that multi-source data integration significantly improves the depth and credibility of management research in technology-driven environments (Boateng & Olexová, 2025).

In organizations that are undergoing digital transformation, managers are faced with the need to understand how AI technology can be integrated into daily work processes. This shows that digital transformation is not only about technological change, but also changes in organizational leadership and management practices. Fernández-Vidal et al. (2022) explain that the success of an organization's digital transformation is greatly influenced by the ability of top management to integrate technology with business strategy. Thus, managers are not only required to have traditional managerial skills, but also digital competencies that allow them to utilize technology effectively.

The change in role is also related to the increasing complexity of the global business environment. Organizations now have to deal with rapidly changing market dynamics, huge volumes of data, and increasing uncertainty. In these conditions, AI is a very important tool to help managers analyze various decision alternatives in a more systematic manner. AI is able to identify patterns in data that are not easily recognized by humans, so it can provide new insights that support strategic decision-making processes (Akinngbe, 2024).

However, the presence of AI does not completely replace the role of humans in organizational decision-making. Instead, AI strengthens the role of managers as strategic decision-makers who are able to interpret the information generated by technology. Managers continue to play an important role in assessing the organization's context, considering ethical factors, and understanding the social implications of any decision taken. Thus, the relationship between humans and AI in organizational decision-making is more appropriately understood as a collaborative relationship than a substitution relationship (Haesevoets et al., 2021). The transformation of the manager's role is also reflected in the change in competencies needed in organizational leadership. In the digital age, leadership no longer only focuses on the ability to manage human resources, but also includes the ability to understand digital technology as well as integrate it into organizational strategy. Vasisht (2025) emphasized that organizational leaders in the era of digital transformation must have competence in managing technology, data, and innovation in order to be able to create added value for the organization.

This change is also related to the emergence of the concept of digital leadership, which is a form of leadership that is able to integrate digital technology in organizational management practices. Türk (2023) explains that digital leadership plays an important role in shaping organizational strategies that are adaptive to technological change. Leaders who have high digital literacy tend to be more able to utilize AI technology to support organizational decision-making processes. In addition, the integration of AI in managerial practices also affects the dynamics of teamwork in

organizations. AI enables organizations to develop data-driven decision-making systems involving various organizational actors. In the system, managers act as facilitators who connect various sources of information and ensure that decisions taken are in line with the organization's goals. This role suggests that managers no longer only act as controllers of work processes, but also as mediators between humans and technology in the organization (Zárate-Torres et al., 2025).

This transformation also requires organizations to develop new managerial competencies. Boateng and Olexová (2025) show that organizations that succeed in digital transformation generally have managers who are able to adapt to technological changes as well as have the ability to lead organizational innovation. This shows that digital transformation is not only related to the adoption of technology, but also to organizational culture changes that favor collaboration between humans and technology. In this context, AI can be understood as a technology that expands the cognitive capacity of humans in organizational decision-making. AI assists managers in processing complex information, while humans continue to play a critical role in understanding the organizational context and making strategic decisions. Thus, collaboration between humans and AI is a key element in creating an organization that is adaptive to changes in the business environment.

Overall, digital transformation has fundamentally changed the role of managers in modern organizations. Managers no longer only act as decision-makers who rely on intuition and experience, but also as managers of decision-making systems involving AI technology. These changes show that the future of organizational management will increasingly be marked by collaboration between human intelligence and machine intelligence. Collaboration between humans and Artificial Intelligence in organizational decision-making has become one of the important phenomena in the development of modern management. In the context of digital organizations, AI no longer functions only as a technological tool, but also as a partner in the process of analysis and evaluation of decisions. This collaboration allows organizations to combine the advantages of technology-based data analytics with human ability to understand the social and strategic context of the organization (Choudhary et al., 2023). The interaction between humans and AI in the decision-making process is often described as a complementary relationship. AI has the ability to process large amounts of data quickly and accurately, while humans have the ability to understand the context, value, and strategic implications of a decision. The combination of these two capabilities allows organizations to generate more comprehensive, evidence-based decisions (Hao et al., 2024).

However, the effectiveness of human and AI collaboration is greatly influenced by the level of trust managers have in the technology. Wen et al. (2025) show that trust in AI is an important factor that determines the extent to which technological recommendations are used in organizational decision-making. If the level of trust in AI is low, then managers tend to ignore recommendations generated by AI systems even though they are backed by strong data. In addition, the dynamics of human collaboration and AI are also influenced by the design of organizational systems that govern how technology is used in the decision-making process. Organizations that are able to effectively integrate AI typically have a work system that allows for a balanced interaction between humans and technology. This includes an evaluation mechanism for AI recommendations as well as a collective discussion process in organizational decision-making (Hillebrand et al., 2025). To understand the dynamics of human and AI collaboration in organizations, it can be seen the characteristics of the interaction between the two actors in the decision-making process. These interactions can be classified based on the role of humans and technology in the organization's decision-making system. The following table illustrates the key characteristics of human and AI collaboration in organizational decision-making.

To provide a structured overview of the focus of digital nutrition literacy research, the following is a table of the results of the literature synthesis:

Table 1. Characteristics of Human–AI Collaboration in Managerial Decision-Making

Dimension	Human Role	AI Role	Organizational Impact
Data analysis	Interpreting contextual meaning of data	Processing large-scale datasets and detecting patterns	Improved analytical accuracy
Strategic evaluation	Assessing ethical and strategic implications	Generating predictive models and simulations	Better strategic planning
Validation decision	Evaluating AI recommendations	Providing data-driven insights	Reduced decision bias
Innovation support	Identifying opportunities and creative strategies	Suggesting alternative solutions through algorithms	Increased innovation capability

The table shows that human and AI collaboration in organizations is not a competitive relationship, but rather a complementary relationship that complements each other. AI plays a role in processing data and generating algorithm-based analysis, while humans play a role in interpreting the results of the analysis in an organizational context. The collaboration allows organizations to produce more rational and evidence-based decisions. The dynamics of collaboration also show that AI cannot completely replace the role of humans in organizational decision-making. Although AI is capable of generating complex analyses, it still requires human interpretation to understand the strategic implications of the results of the analysis. Thus, organizational decision-making remains a social process that involves interaction between various organizational actors. In addition, the integration of AI in organizational decision-making also has the potential to increase organizational innovation. AI is able to produce various alternative solutions that may not be thought of by humans, so it can help organizations in developing more innovative strategies. In this context, human and AI collaboration can be understood as a form of cognitive augmentation that expands the capacity of human analysis in organizations (Qizi, 2025).

On the other hand, the integration of AI in organizations also requires a change in the organization's culture. Organizations need to develop a work culture that is open to the use of technology and encourages collaboration between humans and digital systems. In the absence of a change in organizational culture, the use of AI in decision-making can cause resistance from managers who feel that the technology threatens their role in the organization (Sarbu, 2025). Overall, the dynamics of human collaboration and AI in organizational decision-making show that AI technology does not replace the role of humans, but rather strengthens the organization's decision-making capacity. The collaboration allows organizations to leverage technological advantages while maintaining the role of humans in understanding the social and strategic complexities of organizations.

The integration of Artificial Intelligence in managerial decision-making practices has not only brought technological changes, but also resulted in significant managerial implications for modern organizations. These changes relate to how organizations design work systems, develop leadership competencies, and manage the relationship between humans and technology in the decision-making process. In this context, AI is not only understood as an analytical tool, but as an essential component in an organizational management system that can influence leadership dynamics, organizational structures, as well as strategic decision-making patterns (Hillebrand et al., 2025). One of the key implications of the integration of AI in management is the increasing need for managerial competencies that are able to manage digital technologies strategically. Managers are not only required to understand the operational aspects of the organization, but also must have adequate technological literacy to be able to interpret the results of the analysis generated by the AI system. In the context of digital transformation, this ability is an important factor that determines the success of organizations in utilizing technology as a source of competitive advantage (Vasisht, 2025).

In addition, the integration of AI in organizational decision-making also demands a change in organizational leadership patterns. Leadership in the digital age tends to be collaborative and data-driven, where managers must be able to integrate the various sources of information generated by digital systems. Musaigwa (2025) explained that leadership in the era of digital transformation requires the ability to manage technological changes, develop a culture of innovation, and encourage collaboration between humans and digital systems in organizations. However, the application of AI in managerial decision-making also raises various ethical challenges that need to be addressed by organizations. One of the main issues has to do with the potential for algorithmic bias that can affect the quality of organizational decisions. AI systems trained using historical data have the potential to reproduce the biases contained in that data, so that they can produce decision recommendations that are not entirely objective. Therefore, organizations need to ensure that the use of AI in decision-making is still accompanied by human oversight to minimize the risk of algorithmic bias (Alam & Khan, 2024). In addition to the issue of algorithmic bias, the integration of AI in management also raises questions about the accountability of organizational decisions. In AI-based decision-making systems, it is often difficult to determine who is responsible for the decisions generated by the system. This situation can create an ethical dilemma if the decisions made by AI have a negative impact on the organization or society. Therefore, organizations need to develop a clear technology governance framework to ensure that the use of AI remains within the framework of managerial responsibility (Choudhary et al., 2023).

Another challenge that arises in the integration of AI in organizations is resistance to technological change. In some cases, managers and employees may feel that the use of AI can reduce the role of humans in the organization. This perception can create resistance to the implementation of new technologies, which can ultimately hinder the organization's digital transformation process. Therefore, organizations need to develop organizational change strategies that are able to encourage the acceptance of technology while affirming that AI functions as a supporting tool, not a substitute for human roles (Sarbu, 2025). On the other hand, the use of AI also has great potential to increase organizational effectiveness if managed appropriately. AI can help organizations identify new business opportunities, improve operational efficiency, and speed up complex data analysis processes. Thus, organizations that are able to integrate AI strategically will have better ability to respond to changes in the dynamic business environment (Porath, 2023). Collaboration between humans and AI in organizations also has the potential to increase organizational innovation. AI can help generate various alternative solutions based on data analysis, while humans play a role in evaluating these solutions based on strategic and contextual considerations. The interaction between the two actors can create a more creative decision-making process and is adaptive to changes in the business environment (Hao et al., 2025).

Thus, the integration of AI in managerial decision-making can be understood as an organizational transformation process that involves technological changes, leadership changes, and organizational culture changes. Organizations that are able to manage all three aspects in a balanced manner will have a greater opportunity to harness the potential of AI in improving the quality of strategic decision-making.

4. CONCLUSION

This research shows that the development of Artificial Intelligence has brought significant changes to managerial decision-making practices in modern organizations. Digital transformation is driving the emergence of new decision-making patterns that involve collaboration between human intelligence and machine intelligence. In this context, AI plays a role as a decision support system that is able to process large amounts of data, identify information patterns, and generate analytics-based recommendations. Nevertheless, the role of humans remains an important element in the organizational decision-making process, especially in understanding the strategic context, considering ethical aspects, and evaluating the social implications of every decision taken.

The findings of this study also show that the integration of AI in organizations has driven the transformation of the manager's role from a single decision-maker to a facilitator who manages the interaction between humans and technology in the decision-making process. This change requires

managers to have new competencies in the areas of digital literacy, data analysis, and collaborative leadership. Therefore, organizations need to develop technology management strategies that are able to support collaboration between humans and Artificial Intelligence effectively. In practice, this study recommends that organizations develop a transparent AI governance framework, improve managers' digital competencies, and build an organizational culture that supports the use of technology as an augmentation tool in managerial decision-making.

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