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The role of artificial intelligence in management decision making: A systematic review

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Abstract--The aim of the paper was to explore the role of artificial intelligence in management decision making. The focus was to investigate how AI has been instrumental in assisting managers in various organizations make better decisions. The paper was a systematic review and a total of fifty-eight (58) papers were analyzed out of which fifty-three (53) were considered for the review. The respective papers were sourced from research databases such as JSTOR, Wiley, Taylor & Francis, Research Gate and Google scholar. In order to ensure consistency in papers reviewed, the keywords used for searching were “artificial intelligence”, “decision making”, “strategic decision making” and “business decision making”. The selection criteria also considered factors such as all the papers must have abstracts, clearly defined methodologies and findings. The exclusion criteria were therefore research papers that do not meet these requirements and are also not found in the research databases state. The current paper found that artificial intelligence has been predominantly used by managers for decision making in the last five years (2020 – 2025). In addition to this, the use of artificial intelligence also has some internal elements such as resistance to change by employees, lack of AI related skills by managers as well as non-existence data protection policies which impede the full deployment of artificial intelligence. It was found from the reviewed papers also that leadership, internal culture, organizational policies among others, are critical in the deployment of artificial intelligence for decision making among managers. The paper concludes that artificial intelligence should be continuously merged with human skills in order to derive the best out of its implementation.

Keywords---Artificial Intelligence, Decision-making, Strategic Decision-making, Business Decision-making.

1. Introduction

Artificial intelligence (AI) is a promising new technology that is expected to transform the way companies operate. It mimics the cognitive and reasoning skills of humans and can perform various tasks and actions autonomously (Russell & Norvig, 2021). The adoption of AI in business processes is expected to transform the way decisions are made. Instead of relying on traditional managerial and experience judgment, AI can provide facts-based insight by handling large amounts of data at a fast and accurate rate (Bory, 2023). The rapid emergence and evolution of AI technology is expected to transform how companies operate in the future (Oberoi, 2020). It can help them make better decisions and keep up with their competitors. Due to its immense capabilities, AI has been regarded as a strategic partner for most companies. However, it still has a long way to go before it can truly transform the way organizations operate (Babar, 2024). Some of the areas that are being used by AI include natural language processing, machine learning, and predictive analytics. The use of AI techniques for forecasting, analyzing, and planning has the potential to enhance the efficiency of organizations by allowing them to perform tasks that previously required a human workforce (Khan, 2025). However, it has also raised concerns about the potential impact of the technology on the operations of businesses. Some of these include the development of algorithmic biases and the replacement of workers with machines (Raisch & Krakowski, 2021). Despite the widespread use of AI in various areas of management, few studies have been focused on its application in the decision-making process of companies (Brynjolfsson & McAfee, 2017; Davenport & Mittal, 2020). Most of the literature on the subject focuses on the enhancement of processes or technical performance. It also doesn't provide adequate insight into its broader implications for various managerial and ethical aspects. This gap is significant because strategic decisions are the foundation of a company's long-term success. They also serve as the basis for its ethical and organizational values. It is therefore important to study how AI can influence these decisions to improve efficiency and protect the interests of stakeholders.

Artificial intelligence involves the simulation of human-like reasoning, decision-making, learning, and problem-solving capabilities by computer systems (Tabesh, 2021). These systems utilize numerous computational resources and algorithms to identify patterns in vast datasets and produce accurate predictions (Shank et al, 2019). AI is composed of various sub-fields, such as deep learning, machine learning, and neural networks. These allow systems to perform tasks traditionally associated with the cognitive abilities of humans (Sheil, 1989). ML, for instance, helps software improve its performance by exposing itself to data without explicitly being programmed for specific results. Deep learning (DL) and neural networks (NN) are also known to perform well in large datasets. By utilizing multiple neural networks, DL can provide more accurate predictions (Simon, 1995). Neural networks are essentially computational frameworks that are modeled after the human brain, which makes them ideal for performing advanced modeling and data processing. The rapid emergence and evolution of AI has greatly accelerated the integration of its capabilities into the decision-making process of global organizations (Panch et al., 2018). Through the use of predictive models, businesses can improve their efficiency and competitive position by anticipating potential threats and customer demands. The global market for AI-

related services was estimated at around \$95 billion in 2021. It is expected to grow further due to the increasing number of companies adopting it and the high expectations for economic value creation (Kaplan, 2022). Some of the prominent companies that have started implementing AI are Amazon, Google, IBM, and Alibaba. These companies are able to use predictive models to improve their operations and enhance their profitability (Joshi et al, 2019). Several industries, such as healthcare, retail, manufacturing, and finance, have started using predictive models developed using AI to improve their competitive advantage and optimize their strategies (De Carlo et al., 2021).

Predictive models are utilized by businesses to predict the future events that are based on historical data. These tools are commonly used in forecasting the changes in the market and analyzing complex data (Tabassi, 2023). They can also improve the decision-making processes by identifying and predicting the likely changes in customer behavior. In today's dynamic market environment, predictive modeling and analysis are becoming more important tools for strategic foresight. They help companies identify and act on the most critical factors that will affect their business, such as changes in consumer demands and technological trends (Huang & Rust, 2018). According to Von Krogh (2018), integrating predictive models into strategic planning can help companies move from reactive to proactive positions, which can significantly improve their competitive advantage. Through the use of predictive models, businesses can anticipate market shifts and identify potential risks and opportunities before they happen (Suman, 2021). Moreover, machine learning algorithms are being used in predictive analytics to transform how decisions are made across different industries. Some of the most popular machine learning algorithms include the Random Forest, Support Vector Machines, and Gradient Boosting. These are praised for their high accuracy and adaptability in various applications, such as financial forecasting and market segmentation (Tambe et al., 2019).

The popularity of these algorithms can be attributed to their ability to handle large datasets and provide accurate predictions. For instance, the Random Forest model is highly praised for its ability to perform well in forecasting and customer retention (Bawack et al., 2022). According to Kitsios and Kamariotou (2021), the gap between the technical capabilities of AI and the strategic alignment of organizations is a significant issue that needs to be resolved in order to fully realize its potential. Despite the availability of advanced tools, many companies still struggle to align their predictive models with their overall goals. Duan et al (2019) state that in order to achieve strategic alignment, an organization must possess complementary capabilities. These include the capability to lead and collaborate with other staff members, agile structures, and the ability to make data-driven decisions. In addition, a comprehensive approach to integrating predictive analytics into strategic processes must ensure that such insights can effectively deliver value. According to Di Vaio et al (2020), the gap should be bridged using frameworks that accommodate the various facets of AI, such as interpretability, accuracy, and strategic relevance. This will ensure that the decision-making process can support the overall strategic goals of the organization. This systematic review therefore sought to explore how artificial intelligence has been able to influence management decision making organizations from the global perspective.

2. Objectives

The aim of the paper was to explore the role of artificial intelligence in management decision making. The focus was to investigate how AI has been instrumental in assisting managers in various organizations make better decisions.

3. Methodology

The systematic review focused on research papers which focused on artificial intelligence in management decision making. The selection of the papers was based on a combination of credible search databases such as Google Scholar, Research Gate, JSTOR, Taylor & Francis as well as Wiley. The selection criteria for each of the papers was based on keywords such as “artificial intelligence” and “management decision making”. In accessing the respective databases which have been outlined above, the snowball approach was used and this is supported by Greenhalgh and Peacock (2005) in the sense that the keywords used in most of the papers led to the consideration of other papers with similar keywords and research focus. In this paper, premium was given to specific areas of artificial intelligence application such as strategic decision making, financial management, project management and marketing management. This approach in paper search permitted us to broaden our scope and also gain access to more papers that can assist us have a sound opinion on how artificial intelligence is used mainly for the purposes of decision making. In total, fifty-eight (58) articles were reviewed but fifty-three (53) of them were directly in line with the aim of this study. The consideration of artificial intelligence as an area of study was based on its current proliferation for different reasons according to the needs of organization. In view of this, the papers chosen had to meet the following criteria in order for them to be selected;

- The papers must have keywords such as artificial intelligence, decision making, management decision making, business decision making and strategic decision making
- The papers are to have a holistic abstract that outlines the direction of the paper
- The aims, methodology and findings of the paper must be clearly stated
- There should be appropriate conclusion for the paper.

Keeping the above criteria in mind, we deployed content analysis by reviewing each of the papers to identify consistency and conformities. The respective methodologies adopted were of importance to this systematic review and there was the need to also relate the findings presented by each of the papers to ensure that they satisfy the study objectives of the very paper. In order to establish clarity, the results of our analyses are presented in tables.

4. Results

This section of the paper presents the findings obtained based on our systematic review of each of the papers considered. In this section, the main areas of focus were time frame and their relevance, themes of the various papers reviewed, methodological approaches, levels of analysis and similarities in key findings.

4.1. Time Frame and Relevance

Artificial intelligence has existed in many forms in the past and in the modern era, it has been deployed by management in many respects. Duan et al (2019) asserted that the usage of artificial intelligence in modern times has been accelerated mainly because the definition of work has changed from what was previously understood (manual systems of task accomplishment). In another breadth, Tabassi (2023) was of the view that if progress of any sort is to be attained within the field of management, there is the need to consider technology and for that matter, artificial intelligence to assist in making analysis and data-driven decisions as much as possible. These views informed the basis upon which emphasis was placed on time and year of publication for the papers reviewed. Indeed, if modern decisions can be influenced by artificial intelligence, empirical support was required and this explains why 85% (45 papers) of the papers considered were from 2020 upwards. This was done in order to clearly confirm or disprove the assertions made by Duan et al (2019) and Tabassi (2023). It is important to state further that over the timelines considered for this review, the findings pointed to more managers using artificial intelligence for respective decisions in current years (2020 – 2025) as compared to those before 2020. This indicates that situating artificial intelligence and how relevant it is in the modern era, the recency of research papers is critical and the corresponding findings also support that artificial intelligence has become more practical in modern management decisions than previously.

Table 3.1. Timeline for Articles

Year	Frequency	Percentage
2025	11	20.8%
2024	15	28.3%
2023	8	15.1%
2022	6	11.3%
2021	3	5.7%
2020	2	3.8%
2018	1	1.9%
2006	1	1.9%
1995	1	1.9%
Other*	5	9.4%
Total	53	100%

4.2. Themes Identified

The 53 papers reviewed came from obvious different angles in terms of their core objectives and findings presented. However, there were certain themes which were observed to run through all of the papers reviewed and they have been presented and discussed below as follows.

- **Theme one: Artificial intelligence as augmentation tool instead of a replacement**

From each of the papers reviewed, it was observed that artificial intelligence was viewed more of as a collaborator and not a system that is coming to

replace humans on their jobs. In the reviews, it was evident that most managers consider artificial intelligence as a tool that can fast track decisions, improve the quality of decisions as well as create multiple forms of accessibilities through communication platforms. Naturally and as expected, there were observed resistance to the deployment of artificial intelligence and this was mainly as a result of some employees fearing job loss and even among managers, automation and over reliance on AI use was advised against. This comes as a result of the same decision quality of managers which if not appropriately protected within human contexts, can be surrogated entirely by artificial intelligence.

- **Theme two: Ethical, transparency and trust challenges**

The use of artificial intelligence for decision making among managers was not a perfect idea to say the least. As a matter of fact, it was observed from the respective articles that artificial intelligence has a set of biases and these biases come about as a result of data that such systems are trained on. If the original data used by the system itself is flawed, artificial intelligence may also produce flawed outcomes which eventually defeats the purpose based on which it was considered in the first place. Additionally, there was another issue related to what is known as “the black box problem”. In most cases, the rationale behind certain decisions by the AI is not known to managers. It is only the observed outputs that are considered for decision making. This is problematic because humans (managers) do not make decisions in a vacuum. There are moral and philosophical reasons which back such managerial decisions and for that matter if they are missing or not known in the decision-making process, trusting the decision itself can be a major concern. Data privacy is an additional concern when it comes to artificial intelligence usage. In most instances, organizations that use artificial intelligence do not have internal managerial policies that prescribe how AI should be used and how data itself should or can be protected.

- **Theme three: Critical success actors of artificial intelligence usage**

The success or failure of artificial intelligence does not occur independently. The reviewed papers identified four main elements or critical success factors of artificial intelligence use for decision making of any kind and they are data infrastructure, leadership, AI literacy as well as strategic alignment. It was observed from the papers that decision making through the use of artificial intelligence must be contextualized and there is always an impact that it has on employees in general. It was found from the papers also that internal culture can influence resistance to artificial intelligence adoption and as a result of this, it is important to have the right internal culture that will permit the effective deployment of artificial intelligence.

- **Theme four: Measurable performance improvements**

The papers led to the findings that artificial intelligence can result in at least 30% of return on investments after it has been implemented. In improving decision making, it was gathered further that speed and efficiency has contributed to managers increasing their outputs on the job. In terms of decision quality, it was observed from the papers that artificial intelligence

affords managers the opportunity to appreciate available data and make decisions that are based entirely on objective inputs.

Table 3.2. Themes Identified

Theme	Core Premise	Key Evidence from Papers	Common Challenges Linked
Theme one: Augmentation, Not Replacement	AI and human intelligence are complementary. Optimal outcomes arise from collaborative hybrid models.	Preference for AI-to-human sequential models; Superior outcomes of hybrid systems; Irreplaceable human roles in ethics, creativity, and context.	Fear of job displacement; Over-reliance on automation; Managing the human-AI interface.
Theme two: Ethical, Transparency & Trust Challenges	AI introduces novel risks that can undermine fairness, accountability, and adoption if not managed.	Pervasive mentions of algorithmic bias, "black box" opacity, data privacy concerns, and accountability gaps.	Erosion of trust in AI systems; Legal and reputational risks; Resistance from stakeholders.
Theme three: Critical Success Factors	Successful AI adoption is a socio-technical endeavor requiring more than just technology.	Emphasis on data quality, AI literacy/upskilling, leadership support, cultural readiness, and strategic change management.	High implementation failure rates; Resource constraints (skills, budget); Organizational inertia and resistance.
Theme four: Measurable Performance Improvements	When integrated responsibly, AI delivers tangible, positive impacts on decision-making and business results.	Metrics on improved accuracy, speed, cost reduction, revenue growth, and competitive advantage across multiple studies.	Connecting AI investment to clear ROI; Measuring intangible benefits (e.g., better strategic agility).

4.3. Methodological Approaches and Levels of Analyses

The respective papers adopted different methodological approaches and there were seven (7) approaches used. These were systematic review, quantitative, qualitative, mixed methods, case study analyses, experimental/quasi experimental and other mathematical approaches. It was found that systematic literature/conceptual review was the most predominant among the papers and this was because a vast majority of the authors were interested in what is currently being said about the topic (artificial intelligence) as well as the context under which artificial intelligence itself is being deployed by managers. Additionally, it was gathered that quantitative as well as qualitative approaches

constituted 32.1% and 18.9% respectively of the total number of papers reviewed whereas mixed methods made up 17% of the number of reviewed papers. This shows that over 65% of the research papers reviewed adopted quantitative, qualitative or a combination of the two (mixed methods) and this implies that most of the authors were focused more on establishing associations as well as developing observable concepts and themes emerging from the use of artificial intelligence for managerial decision making.

Table 3.3. Methodological Approaches

Methodological Approach	Frequency	Percentage
Literature / Conceptual Review	18	34.0%
Quantitative / Empirical	17	32.1%
Qualitative	10	18.9%
Mixed-Methods	9	17.0%
Case Study Analysis	8	15.1%
Experimental / Quasi-Experimental	2	3.8%
Other (e.g., Mathematical Modeling, Framework Proposal)	3	5.7%

4.4. Levels of Analyses

Multiple levels of analyses were employed by the authors and these levels were identified to have been largely based on the objective of the papers as well as the methodological approach. For the qualitative papers, it was found that inductive coding and thematic analyses were used the most. For the quantitative papers, analytical tools such as regression, ANOVA, SEM and PLS-SEM were used in order to establish associations and causal effects. The other mathematical tools used to test the viability of AI tools were quite specific and they have been tabulated below. It is relevant to point out that the level of analyses demonstrated are reliant on the scope of objectives as well as the robust nature of the papers themselves.

Table 3.4 Levels of Analyses

Method of Data Analysis	Frequency	Description / Common Tools
Statistical Analysis & SEM	15	Includes regression, ANOVA, descriptive stats, and especially Structural Equation Modeling (SEM) and PLS-SEM (using SmartPLS, WarpPLS).
Thematic / Qualitative Analysis	14	Inductive coding, thematic synthesis of interview/focus group data (often using NVivo).
Literature Synthesis / Thematic Review	13	Systematic (PRISMA) or narrative review methodologies for identifying themes and frameworks.
Comparative / Conceptual Analysis	7	Comparing frameworks, human vs. AI decision-making, or traditional vs. AI-enhanced processes.

Machine Learning / AI Model Training	5	Developing/testing specific AI models (ANNs, D-R-VAE algorithm, LLM evaluation).
Correlation & Regression	4	Standalone inferential statistical tests.
Mediation/Moderation Analysis	3	Using tools like Hayes' Process Macro to test indirect effects.
Other	4	Includes content analysis, tensor algebra modeling, cost-benefit analysis, and expert evaluation.

4.5. Similarities among the papers

The various papers argue that artificial intelligence can transform the way we make decisions. The main idea is that by applying AI technologies, such as predictive analytics and machine learning to the processing of information, we can transform the way we make decisions. The main goal of these studies is to demonstrate how AI can improve or enhance the decision-making process. They also want to analyze and argue for the positive outcomes that it can bring. AI integration can be risky and not straightforward. Every paper that has been published explicitly states that there are major challenges that can be encountered when implementing this technology. These include ethical concerns, such as the potential for algorithmic bias and inadequate accountability. Also, the lack of transparency and explainability of the technical issues are some of the main concerns that have been raised. The various human and organizational barriers that can be encountered when implementing this technology include the security of data, privacy, and implementation costs. The respective papers also imply the need for a collaboration between humans and the technology. The idea of AI as a solely decision-maker is not supported by any of the studies. The studies that have been published on the subject of AI are designed to provide a comprehensive analysis of the various aspects of the technology's potential. They are also focused on addressing practical issues related to the management and operations of organizations. All of the papers focused on providing a future-oriented perspective. They analyze the current trends in the field and develop recommendations for the future. The discourse in these studies also revolves around navigating the future of competition, strategy, and work.

5. Conclusion

It can be concluded from the paper that artificial intelligence is broadly instrumental in management decision making. Furthermore, the resistance to artificial intelligence by both managers and subordinates could be best managed through training and cultural reorientation. The paper concludes that a symbiosis between humans and technology within organizational settings can be beneficial especially for decision making quality. It was further concluded that return on investments when it comes to managerial decision making based on artificial intelligence could be best achieved when there are measurable key performance indicators. This systematic review therefore concludes that artificial intelligence must be situated within organizational contexts, given the fact that management decision making ought to benefit the organization itself in both the long and short runs.

6. Contributions of the paper

The paper unearths how artificial intelligence can assist managers to make better and informed decisions. In addition to this, the paper was able to identify inherent challenges that impede the deployment of artificial intelligence in organizations as well as the critical success factors that can drive the successful implementation of artificial intelligence. The latter contribution is important because organizations (must appreciate the need to create an enabling environment that fosters managers' ability to use artificial intelligence. The papers revealed that the changing nature of work is leading to the need for speed, efficiency and data driven decisions. In this manner, it is important for managers and organizations in general to make good use of artificial intelligence. Apart from this practical contribution, the paper also contributes to academic literature by exploring the underlining themes and concepts that drive artificial intelligence globally.

7. Policy implications

Data policy is important. From the national level to organizational level, it is important to create a culture that appreciates the role of technology. The corporate use of artificial intelligence must be adequately monitored and controlled. The paper indicated that data privacy and protection is key and their absence can actually lead to employees and even managers resisting the need to use AI in the first place. Organizations must therefore develop guiding principles and policies that dictate how technology ought to be used, its tenets and the manner in which organizational data can be protected.

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