



American Journal of Applied Research and AI (AJARAI)

VOLUME 1 ISSUE 1 (2026)



PUBLISHED BY
E-PALLI PUBLISHERS, DELAWARE, USA

Artificial Intelligence in Strategic Decision-Making: From Automation to Augmentation

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Article Information

Received: November 2, 2025

Accepted: February 07, 2026

Published: March 02, 2026

Keywords

Artificial Intelligence, Artificial Awareness, Augmentation, Big Data, Decision Making

ABSTRACT

Artificial intelligence (AI) is a research area that has had significant up-and-down trends in its history, dating back to more than 60 years of activity. Recent years have witnessed a long-term revival driven by advances in computational power and the proliferation of big data. With the fast development of this new age of AI, once more it is an object of critical academic research. The purpose of this paper is to discuss the issues of implementing the latest AI-based systems to aid the decision-making process in the organization and suggest a list of the relevant research directions of the information systems (IS) scholars. It has brought up debate around the issue of human judgment in the core business processes as some worry that intelligent machines will continue to replace human decision-makers. In this article, the author is pushing towards a more subtle and practical view. It argues that a symbiotic interaction between human and artificial intelligence can improve the outcomes of the organization: AI systems can expand human cognition by dealing with complexity and performing structured data processing, whereas humans can provide the necessary holistic, intuitive, and moral judgment especially in the environment of uncertainty and ambiguity. On a macro level, AI is showing an increasing ability in work formerly seized as the preserve of human activity. Due to the displacement paradigm, a counter-paradigm considers AI not as a replacement of human brains but as an intelligence augmentation (IA) tool. This study aims to critically examine these conflicting views human replacement versus human augmentation and investigate their implication and possible risks that such views have in the era of more autonomous and perceptive machines.

INTRODUCTION

Over the last few years, mankind has experienced a rapid technological revolution which has occurred in geopolitical, socio-economic and environmental domains across the entire world (Pannu, 2015). The high pace of artificial intelligence development has raised concerns about whether human labor is being overtaken by artificial intelligence. But what is being seen here is a simplistic way of looking at the issue. The primary problem is not the idea of automation, but the implementation and design of AI. The augmentation over automation idea focuses on applying AI to make people stronger instead of weaker, and technology must serve as an assistant in the human development (Brynjolfsson & McAfee, 2014). Augmentation is concerned with human-intelligent systems collaboration. AI is also good at handling data in large amounts, identifying patterns, and carrying out tedious tasks in an accurate manner (Wilson & Daugherty, 2018). Instead, humans bring their creativity capabilities, critical thinking abilities, emotional-intelligence capability, and moral judgment that machines are unable to reproduce. The adoption of AI must be informed by the idea of human augmentation, rather than replacement, with a balance between technology development and morality and humanity (Rouse & Spohrer, 2018).

AI is an ever-changing development because it is the one that focuses on learning through experience, relies on reason in the decision-making process, inference, power,

and responsiveness (Tai, 2020). It can make decisions in case of prioritization and address ambiguity and complexity. When machines are capable of performing tasks through embedded programs, this is termed as artificial intelligence. Artificial intelligence deals with the ability of programmable machines to simulate human intelligence and thus is able to imitate human behavior such as learning and problem solving (Kelly *et al.*, 2012). AI deals with the formulation of systems that consist of intellectual processes such as reasoning, finding meanings, learning based on previous meanings and generalizing. Computer-Aided Instructions, expert systems, robotics, natural language processing, speech understanding, sensory systems, neural computing scene recognition, and computer vision are some of such aspects of artificial intelligence (Sadler-Smith & Shefy, 2004). According to Sternberg (2022), human intelligence is a mental attribute that includes qualities to extract learning based on the experience in a way that comprehends abstract ideas to facilitate their adaptation to the situation and the use of the knowledge to cope with the environment.

LITERATURE REVIEW

The article by Thottoli *et al.* (2024) described the chatbots and AI used in academic advising to deal with the issue of offering individual guidance to students. It provides important applications of robo-advisory systems and gaps in current research through systematic review of

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67 publications (1984-2023). Results show that chatbots provide a promising solution to the automated advising process, but additional empirical studies should be conducted to assess their usefulness and integration in college education. Although the research points out the implication of practical development of user-friendly systems, it emphasizes chatbots, which do not give enough attention to other AI technologies. The study helps to understand the institutional perceptions and define the main motives to implement AI-based advising in the learning institutions.

The article by Chan & Tsi (2023) discusses the possibility of AI to substitute or support teachers in higher education. Using literature and survey-based information, the study concludes the majority of the respondents believe that human teachers cannot be replaced, and use such qualities as creativity and emotional intelligence, which are unique to humans. The authors support the idea of an integrative approach, in which AI can support pedagogy, which necessitates a better level of AI literacy and ethical standards. They suggest a viable plan of working with the combined advantages of both. The conclusion underlines the future that involves human educators and AI having a synergistic relationship in order to maximize learning. Salvagno *et al.* (2023) analyze how AI chatbots, such as ChatGPT, are applied to scientific writing, paying attention to the possibility to use them to draft and edit papers. The authors mention that these tools are still not recorded in the literature of critical care but predict their eventual use. They emphasize that the work of chatbots should never substitute expert control and should be strictly checked by the specialists. A lot of ethical concerns such as plagiarism, inaccuracy, and inequality in access are brought up. The paper ends with the recommendation to have an immediate consensus in regulations regarding the responsible application of such AI in scholarly publishing. The study by Song *et al.* (2022) examines the greater effectiveness of human versus chatbot service providers in influencing consumers' intention to adopt assistance in e-commerce. Their experiments demonstrate that this is mediated by the perceived quality of communication and perceived risk of privacy by the user. Also, the desire of a human to have social interaction will moderate views about the accuracy, competence, and risk of privacy of the agent. The findings are strategic to facilitate a better human-computer interaction in digital services within the context of maximizing prospects.

The article by Tamzid (2021) examines how AI affects the recruitment process in a company in the globalization environment. A qualitative analysis of multinational companies in Bangladesh identifies that the existing AI usage is immature and mainly addresses the discrete aspects of pre-screening. Although this automation is one of the major strengths, the study describes the organizational willingness to change towards technology as the main obstacle towards a widespread adoption. The analysis concludes that to achieve the potential of AI to improve the traditional recruitment systems, it is necessary

to tackle these issues of organizational preparation. The study by Alam (2021) focuses on the application of AI in educational management, teaching and learning by a qualitative literature review.

MATERIAL AND METHODS

To understand the dynamic relationship between artificial intelligence (AI) and human judgment in organizations, the study will employ a qualitative, exploratory approach. This is the key question: can AI be best applied as an intelligence augmentation (IA) tool to enhance and expand human cognitive ability or as a possible human decision-maker replacement in organizational scenarios? An overview of research framework is presented in figure 1.

Study Design

The methodological choice used in this study is the qualitative content analysis, which is supported by the conceptual and theoretical orientation of the research. This will help in the systematic review of the existing literature, such as scholarly writings, professional writings, case studies and proven models. In the process of this, the analysis intends to find out common themes, significant gaps and general implications to the integration of artificial intelligence into decision making in organizations.

Data Collection

Systematic acquisition of secondary data of various types of sources was done to make sure a comprehensive analysis of data was achieved. These were peer-reviewed scholarly journals, institutional publications and books and conference proceedings on the areas of information systems, artificial intelligence, and decision sciences. This was enhanced with historical study of decision-making models and organizational theory. The selection of all the sources was strictly made according to their relevance to the research goals, academic validity, and currency so that the analysis will be scholarly and include the latest developments in the field of the technological progress.

Research Framework

The analysis is based on a system that is based on a decision-making typology founded on Herbert Simon, which categorizes decisions into structured, semi-structured and unstructured. In order to deepen such a comparative analysis, three key environmental dimensions are incorporated into the framework: (i) Uncertainty, (ii) Complexity, and (iii) Equivocality. This integrated system is employed to contrast the intuition and experience of humans and the power of analytical AI systems systematically under the different decision-making circumstances.

Assessment Strategy

The assessment strategy we adopted in this review is following.

(i) Focuses on contrasting AI and human cognition in terms of decision-making potential.

- (ii) Artificial intelligence versus intelligence augmentation comparison: Automation and augmentation of system design.
- (iii) Grounding theory in practice: Case studies of augmented decision-making in domains.

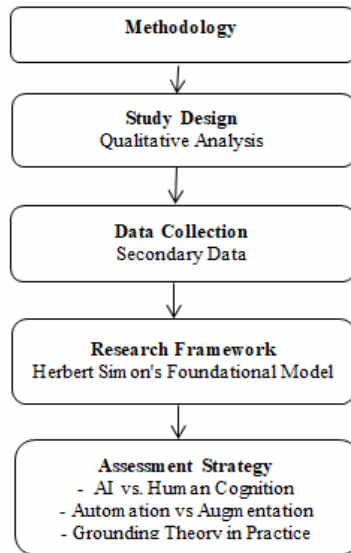


Figure 1: Overview of the research framework

LIMITATIONS

The methodological limitation of the research is that it will only involve the analysis of secondary sources. It does not include the gathering of primary empirical evidence, i.e., original surveys, interviews, or controlled experiments. This leads to interpretive nature of the findings and conclusions made as they are made via a synthesis and critical analysis of the extant literature. Although this method allows a sound conceptual and theoretical base, the implication inevitably is that the propositions being advanced by it would not only be improved by, but also potentially supported by, additional empirical validation. The use of experimental designs or longitudinal designs in future research would be desirable to test and measure the relationships and outcomes that are brought up in this paper empirically.

RESULTS AND DISCUSSIONS

The development of Artificial Intelligence is encouraging increased human-technology interaction with the development of Human-Aware AI. Although the current integrative advances have taken place, AI systems are still unconscious and in reality, they are only limited to specific applications that expand the capabilities of humans in specified areas.

Artificial Intelligence (AI) and Intelligence Augmentation (IA)

The two different paradigms that lie at the center of modern computing are IA and autonomous AI. The focus of IA is on creating interactive systems that

better human thinking and decision-making, which make technology an assistant tool. On the contrary, autonomous AI is supposed to mimic and even take over the human cognitive processes through its uncontrollable nature of functioning. The main limitation of this autonomy is that, very highly structured environments with clearly defined variables and objectives are necessary to assure good performance (Rouse & Spohrer, 2018). The interdisciplinary approach considered in the analysis of these complementary trajectories is Responsible, Usable, and Intelligible (RUI) AI. This framework aims at realizing the promise of AI as an augmentative tool to humans and strictly meets the needs of interpretability, trust, and ethical alignment, which combines technical capacity and oversight needs (Makridakis, 2015).

The main purpose of AI can be defined as the imitation of human cognition with the use of machines, which attracts continuous discussion of the possibility of machines to replace the human brain (Zheng *et al.*, 2017). In computing, the contextualization of this aim is seen in three general historical endeavors, namely, the construction of control systems, the creation of tools that enhance human intelligence, and the creation of an artificial mind (AI). Despite similar technologies used in IA and AI, there is a major difference between the philosophical orientation of agency in both. According to the study conducted by Dwivedi *et al.* (2015), AI systems are created as autonomous agents, and IA architectures consciously treat the human judgment as the primary part of the cognitive process. The underlying technology is not only the source of this underlying difference in agency but also the basis of their contribution to organizational change with AI focusing on automation and IA on human empowerment.

The basic purpose of this area is to improve the intellectual capacities of humans by using communal systems which is termed IA. IA is not created to develop autonomous artificial intelligence, but to stretch the human thought processes, which provides AI with more contextual and ethical reasoning. Empirical evidence to support the effectiveness of this partnership is available. In the domain of medical diagnostics, in particular, a collaborative system that incorporates pathologists and an AI model demonstrated a diagnostic error of 0.5% which is higher than the performance of either the AI employed alone (7.5 percent) or the pathologists alone (3.5 percent) (Wang *et al.*, 2016). This outcome is a sign of the idea of human-machine symbiosis proposed by J.C.R. Licklider where human and artificial intelligent supplement each other in their weaknesses. With the growing proliferation of advanced AI functions, one of the outstanding issues is whether there are best possible frameworks and workflows to make decisions that require a combination of human and artificial intelligence to enhance organizational decision-making. The dilemma of this analysis may be answered through the analysis of two different decision-making processes the analytical and the intuitive and three fundamental organization

issues: uncertainty, complexity, and equivocality (Choo, 1991; Simon, 1972). This difference is further explained by research of managerial and organizational practices, which show that the information processing and the ultimate decisions made are frequently based on a systematic analysis or intuition (Dane *et al.*, 2012).

On the one hand, analysis approach of making decision entails a detailed gathering and logical evaluation of data in order to determine possible solutions. This is a process based on the conscious, rational thought. This mode of analysis is especially well-adapted to be assisted by AI because several of the AI systems, including expert systems and predictive analytics, are created to mimic and enlarge human reasoning.

Uncertainty

Uncertainty, which can be described as the lack of knowledge of what can occur or the consequences it may have, makes the processes of interpretation of situations and making decisions more complex (Choo, 1991). Uncertainty that is encountered within organizations is usually due to partial knowledge of the internal and external environment that may have changed due to people in the organisation, the emergence of disruptive technologies, new market entrants or changing regulatory environment (Guszczka *et al.*, 2017). This uncertainty can be alleviated by AI and other intelligent technologies using stochastic modeling and statistical inference based on data, which is used to come up with new insights and predictions. In particular, predictive analytics is designed to generate new information and forecasts regarding clients, assets, and operation variables. The AI systems also support decision making by effectively integrating human judgments and identifying the complex relationships among the variables, thus, assisting organizations to be able to respond to new information in an adaptable way (Granulo *et al.*, 2018). Furthermore, these technologies may assist in the scanning of the environment by explaining emerging patterns, and semi-automatic tactics of tracking the external organizational environment (Bishop *et al.*, 2000).

The AI systems increase strategic oversight by observing external environment of an organization in order to identify anomalies and give early alerts in order to respond semi-automatically, in time. As an illustration, maintenance records, including those of older planes, can be examined using algorithms in order to detect the emerging failure trends before they become common (Moore, 2016). Human intuition on the other hand is still better in navigating uncertain real-world decisions where data is incomplete. An example of this was Steve Jobs who tended to make decisions based on quick thinking, like giving the iMac a colorful look in just few minutes instead of taking an extended period to analyze it (Ransbotham, 2016). This intuitive ability that is made by implicit learning of previous failures and successes leads to innovative, holistic solutions that can characterize markets even though this does not mean success in every case.

Complexity

Complex contexts are those that have many variables they are interrelated and beyond human cognitive ability to handle the large volumes of data within a short period of time. In this case, AI is better than human decisions by using better quantitative, computational, and analytical ability. Combined with the big data, algorithmic systems provide stringent means of accessing and processing information, thus simplifying problems. As an example, AI can determine the relationship between factors and analyze various possibilities of actions, making decisions more complex easier (Marwala, 2015). Such computing power offers a decision-maker with a set of detailed data analytics and allows navigating complex problems more efficiently.

The applications of artificial intelligence, which are enhanced with deep learning, now can handle large volumes of raw data and do the tasks of evaluating credit risk based on social data or making digital ads, which are now much more optimized. Although machines are able to handle this amount of information and generate good decisions in complex situations, they do not have human intuitive ability. A synergistic strategy, in its turn, combines the speed and analytical force of AI with human experience to make a better decision (Ogiela & Ogiela, 2014). As an illustration, AI-based predictive analytics are paired with thorough human analysis, such as Correlation Ventures, to make investment choices, where the advantages of one approach are balanced by the weaknesses of the other. Algorithms have the capacity to investigate huge volumes of data, including a terabyte of social media posts, and identify offensive content. Nonetheless, even in the case of final moderation, the process is frequently based on the human judgment because the removals are implemented by workers who have background knowledge to apply contextual comprehension (Suri *et al.*, 2020). This is a synergy with the perspective that AI is very good at selecting data to bring out important details, whereas human intelligence is needed to put it into perspective and take action (Hoffman, 2016).

Equivocality

According to Weick & Roberts (1993), equivocality denotes a situation of decision-making, which involves a number of possible interpretations. This uncertainty usually occurs due to the conflicting interest of the different stakeholders like consumers, investors or even political units. This then makes the decision process a subjective and political effort to bring these opposing objectives into perfusion, as opposed to a neutral and objective analysis. The will of interested parties can actively hinder a determined rational, calculated decision. Artificial intelligence (AI) in these situations will provide special tools that will assist in decision-makers finding ways to reconcile competing priorities and clarify unclear situations by organizing information and modeling possible trade-offs.

The AI systems can perform what they consider being the strategically best action in any situation regardless of its unorthodox or counterintuitive nature (Burke & Miller, 1999). This is the cold, rational, objective approach to methodology that is often contrasted by the nature of intuitive decision-making in organizations which are often also subjective, emotionally charged and contextually and relationally sensitive. As a result, the aspect of leadership, formal and informal is critical since leaders have to reconcile the various priorities, generate a consensus, and provide motivation to the stakeholders, which is intrinsically beyond impersonal algorithmic computation.

One should keep in mind that all three uncertainties, complexity, and ambiguity tend to be present during the decision-making process (Saini *et al.*, 2025). To some extent, a blend of analytical and intuitive approaches is the most effective method of handling the majority of organizational decisions (Hung, 2003). According to Martin (2009) language, aspects of analytical and intuitive thinking are necessary though not adequate to the optimal business performance. Innovative instinct and analytical ability will be balanced in the richest corporations in the nearest years. Burke & Miller (1999) provide an example of one manager who expresses the reason why it is not enough to rely on analysis or intuition, particularly in the process of making decisions to convince others to be involved in collaborative decision making: Deduction and intuition are combined in all decisions. Personally, I do not think intuition alone can be very helpful. I suppose you can come across bosses who believe that intuition is synonymous with crafting an answer. As far as I am concerned, the intuition cannot work before you have access to data that you can process and combine with data-based analysis as well as with the previous experience that is the major force that drives the intuition.

With such dynamics, the interaction between artificial intelligence and human judgment may develop in one of the two opposite directions:

1. A productive separation of cognitive work implies that AI will be best placed to cope with analytical complexity, whereas human beings will be in a better position to deal with ambiguity and uncertainty by employing creative and intuitive thinking.

2. As it has been proven, even complex decisions that have an analytical advantage in AI involve some aspects of uncertainty and ambiguity. Accordingly, it can be concluded that in almost any complex situation, the solution to these intractable human factors requires a team approach, and the role of both AI systems and human judgment remain active.

Technology-Human Interaction

The Role of AI in Making Decisions

Decision-Support System Design Criteria

This is a fundamental and ongoing issue of AI system design since it is necessary to achieve end-user acceptance in order to achieve their efficacy in decision-making (Edwards *et al.*, 2000). This is not a new problem that was

only observed with the advent of modern applications but was being observed with the old systems (Mumford, 1994). Therefore, the Information Systems researchers need to offer design specifications on human-technology interaction perspective to come up with effective systems that can help or support human decision makers. Thus, AI systems can be successful based on their ergonomic design but the particular ergonomic demands will be critical concerning the systems to support, augment, replace, or automate human functions (Edwards, 1992).

Difficulties in the Behavior of AI Users

The diverse attitudes and adaptive behaviors in applying AI recommendations as a decision-making tool result in human approval or disapproval of AI (Davenport & Bean, 2017; Miller, 2018). The learning needed to live with the intelligent machines is formalized in such models as the Five Ways of Stepping (Davenport & Kirby, 2016). Moreover, the attitudes of the leadership are decisive, as the scaling of AI on an enterprise-wide basis relies on combining business knowledge with technologies (Ransbotham, 2018). Thus, the final implementation and performance of an AI system are less technical outputs and more heavily mediated by human operators. As a result, one of the main suggestions comes out: the effectiveness and application of AI depends on the personal factors, knowledge of the domain, and comprehensive insight of its users largely.

Integration of AI Systems

Determining Important Success Factors

One of the main technical issues with AI in executive decision support is the capability of the technology to classify a particular user to a specific working domain and apply intelligence into this setting (Duan *et al.*, 2012). These major limitations will have to be overcome in order to have AI applications mirror delicate human instincts and decisions. One of the preconditions of a successful adoption is an excellent organizational comprehension of the adopted technology (Davenport & Ronanki, 2018). This is in the sense that, prior to initiating any AI project, companies have to have a clear understanding of what different technologies are capable of doing and have a realistic view of their strengths and weaknesses as inherent (Davenport & Ronanki, 2018).

Although the key success factors of general information systems have been already determined previously (Dwivedi *et al.*, 2015; Hughes *et al.*, 2017), as well as those of the particular technology, such as data mining (Bole *et al.*, 2015), a research gap exists in essential success factors of general information systems. The absence of the studies that determine the critical success factors that affect the adoption and impact of the contemporary AI in the era of Big Data is also notable. Therefore, we claim that the implementation of AI into the organizational decision-making process is not an unbiased process but will be significantly predetermined by a set of definite, yet to be defined fully, critical success factors.

AI and Big Data: A Synergistic Relationship

The modern boom in AI power is directly associated with Big Data that offers the material base of cognitive computing systems (Gupta *et al.*, 2018). The exploration of new data sources, including social media, is the representation of the further analytical range of this period (Martínez-Rojas *et al.*, 2018). Although the application of Big Data is not restricted to AI (Yaqoob *et al.*, 2016), one of the fundamental tasks of AI is to use cognitive computing to extract meaning in complex, large volumes of data to make a decision, which is a prohibitively time-intensive task without AI (Gupta *et al.*, 2018). In turn, it is urgent to examine the exact synergistic processes between AI and Big Data. The additional studies are necessary to define the unique benefits of their combination and comprehend how AI engines may be developed in the light of the increasing amount, diversity, and speed of data. As such, we hypothesise that there is a need to have a holistic view of AI-Big Data relationship and the role of both in research and practice.

The Artificial Intelligence Application Design & Cultural Considerations

A large body of previous literature recognizes culture as an important variable in technology adoption, which is why the essential question is whether personal, religious, organizational, or even national cultures play a role in the acceptance and use of AI (Dégallier-Rochat *et al.*, 2022). Empirical research shows that there is a significant influence; as an example, the national and organizational culture significantly influences the practice of knowledge management in a particular situation such as in China (Liu *et al.*, 2019). One of the gaps in research is to discover the exact mechanisms, reasons and degree to which these cultural dimensions predetermine the success of AI. Thus, we suggest the following statement: AI application and success are not culturally neutral, but they are probably regulated by varied cultural systems and personal systems of values.

Moral and Legal Issues

The high pace of the development of artificial intelligence (AI) has raised significant ethical and legal issues, which have been discussed and debated by scholars over decades. Since this is a complicated subject, which should be considered in detail, a separate paper would be more appropriate to thoroughly discuss it. Nevertheless, one of the major points that require more research is the role of government in determining the future of AI, specifically how to hold them responsible and make the decisions made by automated algorithms explainable (Duan *et al.*, 2019). One of the primary issues is how governments can devise viable laws, ethical guidelines, and policies to reduce the possible harms and societal dangers of AI abuse. The paper will therefore make the following assertion: The development and deployment of AI should not be left to the will of the environment without governmental regulation to ensure that the societal effects are not harmful.

CONCLUSION

To conclude, artificial intelligence is a revolutionized but auxiliary phenomenon in organizational decision-making. This twelve-question-based analysis determines that the absence of contextual intuition and ethical reasoning is offset by the strengths of AI in its data processing and pattern recognition functions. Technology is thus a win-win with human collaboration being the best way forward, which has to be strategically planned to extract these complementary capabilities. Organizations should therefore abandon a paradigm of merely automating to one of a considered cognitive augmentation with emphasis on systemic adaptability and ethical leadership. The responsible adoption of such technology relies on the establishment of the strong ethical guidelines and the popularization of AI literacy. Finally, the long-term implementation of AI depends on the creation of systems that will benefit human values and supplement, but not substitute, human reason. To do it, it is essential to have a multidisciplinary effort that will guarantee the development of AI as the instrument that will provide a boost in the human capacity and improve the common good.

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