

The Utilization of Artificial Intelligence in Decision-Making and Its Effect on Organizational Advancement

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Abstract

This study utilizes a quantitative approach to examine the influence of decision-making (X1) and the understanding of artificial intelligence (AI) theory (X2) in organizational development (X3). Data acquired from surveys and documents were analyzed using the Partial Least Squares (PLS) approach, and SmartPLS software was used for hypothesis testing. The data suggest that decision-making has a very favorable impact on the development of organizations, but understanding AI theory has a very negative impact. This research emphasizes techniques for improving the deployment of artificial intelligence in order to promote the growth of organizations by incorporating quantitative analysis, ethical issues, and Industry 4.0 technology.

Keywords: Decision-Making, Artificial Intelligence, Organizational Development, SmartPLS, Industry 4.0.

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Introduction

The intense competition among organizations worldwide has accelerated the need to adopt AI to gain a competitive edge (Ransbotham et al., 2018), highlighting *The Growing Role of Artificial Intelligence in Decision-Making and Organizational Development*. One of the key areas of AI application in organizational operations is decision-making (Mikalef et al., 2021). In the digital era, organizations face increasing demands to make swift and accurate decisions in dynamic and uncertain

environments. Camm et al. (2023) highlight the importance of quantitative approaches in supporting efficient and accurate data-driven decisions. Meanwhile, the integration of technologies like artificial intelligence plays a strategic role in driving better decision management.

Smart solutions to enhance organizational capabilities and development are crucial in complex business environments, as organizations often deal with vast information complexity and the need for rapid decision-making. AI has the potential to

revolutionize conventional practices due to its ability to process large volumes of data and provide valuable business insights (Bag et al., 2021). Furthermore, AI applications can automate many manual processes, reducing barriers and improving operational efficiency (Paschen et al., 2020).

A recent survey by Garner revealed that most business executives believe AI is likely to become a major development in their organizations within the next few years (Shin & Kang, 2022). However, an immature understanding of AI theory remains a challenge, potentially hindering organizational development. Thus, this study aims to analyze how decision-making (X1) and AI theory (X2) influence organizational development (X3).

The growing consensus in the literature suggests that investments in AI require careful utilization and development aligned with organizational operations (Collins et al., 2021). AI should be considered a core competency within organizations, with primary operations being enabled or enhanced by appropriate AI applications (Borges et al., 2020). While previous studies have explored challenges associated with AI adoption (Mikalef et al., 2021), there is a limited understanding of how organizations should plan to develop AI into a strategic asset that can be leveraged for decision-making and organizational growth.

Building on these developments, this research focuses on analyzing the impact of digital technology on decision-making theory and its implications for management in the digital era. The study examines how AI influences decision-making and significantly impacts organizational development.

In an era where information is increasingly accessible and analyzable, understanding

decision-making theory in digital environments is essential for managers and organizational leaders to remain competitive. This research aims to identify changes in decision-making theory within a digital context and its impact on organizational development. By conducting this study, a more comprehensive understanding is expected regarding AI's role in decision-making and how this technology can be utilized to achieve organizational efficiency and effectiveness.

Literature Review

1 Decision-Making

Decision-making is a fundamental cognitive process in human behavior that involves selecting a choice from a range of alternatives based on subjective preferences (Christopoulos et al., 2018). Terminologically, decision-making refers to a series of activities undertaken by individuals to solve problems by determining the most rational alternatives suitable to the organizational environment. It entails selecting from various options deemed most beneficial for specific interests (Mahanum, 2021). The decision-making process occurs when there are two or more alternatives to choose from (Damayanto & Andriani). Decision-making is required in various aspects of life, from simple daily decisions like choosing a product or meal to complex ones based on current needs and conditions (Fatimah, 2020). Quantitative decision-making forms the foundation of effective management, enabling organizations to enhance efficiency and accuracy (Camm et al., 2023). In uncertain situations, combinatorial optimization introduced by Goerigk and Hartisch (2024) helps organizations address risks and variability by offering more robust solutions.

2 The Role of Artificial Intelligence (AI)

Artificial Intelligence (AI) is a subfield of computer science that focuses on enabling computers to perform tasks typically requiring human intelligence, such as pattern recognition, natural language understanding, and decision-making (Haenlein & Kaplan, 2019). Technological advancements in data and computation have allowed AI to move from theory to practical application. In the context of decision-making, AI, particularly through machine learning, can predict outcomes of various scenarios with high accuracy by using algorithms that learn patterns from historical data. This capability allows AI to provide recommendations that support managers in making optimal decisions. Additionally, AI enables decision automation in certain situations, such as inventory management or investment risk analysis, making decision-making processes faster and more efficient. However, AI also poses ethical challenges, such as potential biases in the algorithms used. If the historical data utilized contains biases, AI-driven decisions may result in unfair impacts on certain parties (Hakim, 2023).

3 Organizational Development

An organization is a social unit intentionally structured to achieve specific goals through human interaction, goal-directed activities, and an established organizational structure. According to Boone and Katz, an organization is a process involving interactions among individuals to achieve predetermined objectives. Organizations consist of three key elements: human interaction, activities directed toward goals, and organizational structure (Nasution et al., 2023). Organizations are also defined as social units that function continuously to achieve a set of shared goals. With technological advancements, organizations

face the need to adapt to dynamic and complex business environments, including leveraging technologies like AI to enhance operational effectiveness and efficiency.

Research Method

- This research employs a quantitative method with a Partial Least Squares (PLS) approach to analyze the relationships between variables:
 - X1: Decision-making
 - X2: AI Theory
 - X3: Organizational Development
- The study utilizes two sources of data, namely primary and secondary data.
 - **Primary Data:** Data collected directly by the researcher through specific methods during a particular period. This data is obtained via questionnaires, which include questions regarding the influence of Artificial Intelligence and organizational development on decision-making.
 - **Secondary Data:** Data derived from sources that have been processed and presented in the form of tables or diagrams. Secondary data is collected from literature, records, and documents related to decision-making.

The researcher seeks information from various sources to gain a deeper understanding of how artificial intelligence can be used to enhance the efficiency of public decision-making processes. A literature review will help identify best practices, shortcomings, and opportunities for innovation in decision-making and organizational development.

SmartPLS 3 is a software application used for Partial Least Squares Structural Equation Modeling (PLS-SEM), a statistical technique that is widely applied for analyzing complex relationships between multiple variables. SmartPLS 3 is particularly useful for exploring latent constructs and their relationships, and it is often preferred in fields like social sciences, marketing, and management. The software enables researchers to perform both formative and reflective measurement models, making it a versatile tool in various research contexts.

In PLS-SEM, the focus is on predicting relationships and explaining the variance of endogenous constructs rather than just confirming theoretical models. SmartPLS 3 is designed to handle small to medium sample sizes effectively, which makes it suitable for exploratory research, especially when the theoretical framework is in its early stages of development.

The key strengths of SmartPLS 3 include:

- **User-friendly Interface:** It allows researchers to create models and run analyses without extensive statistical knowledge.
- **Path Modeling:** It visualizes the relationships between variables, making the results more interpretable.
- **Bootstrapping Method:** This technique is used to assess the significance of path coefficients and other model parameters.
- **High Flexibility:** It allows for the testing of both measurement and structural models in a single run.

SmartPLS 3 is commonly used in this research to test hypotheses and evaluate the strength and direction of relationships

between the decision-making process, AI theory, and organizational development.

Discussion

In this study, the author seeks to understand whether AI can enable organizations to enhance their decision-making capabilities and foster organizational development. Specifically, the author constructs the theory of core competencies to develop a conceptualization of AI competencies that goes beyond merely technical aspects of AI. Through this conceptualization, the author argues that organizations capable of developing AI competencies will experience improvements in organizational performance through their decision-making processes. Specifically, the author contends that AI competencies enable organizations to grow and evolve. The result can be seen in Table 1. The relationship of organizational development from the decision-making and AI Theory perspective.

Table 1

Relationship of organizational development, Decision-making, and AI.

Hubungan	Original Sample	T-Statistics	P-Values
X1 -> X3	1.115	19.259	0.000
X2 -> X3	-0.204	3.113	0.002

Based on the test results above, it can be explained that: • X1 -> X3: Decision-making has a significant positive impact on organizational development. This suggests that the ability to make informed and effective decisions plays a crucial role in driving the progress and growth of an organization. Decision-making processes, when

strategically executed, can enhance the organization's adaptability, efficiency, and overall performance. • X2 -> X3: Understanding AI theory has a significant negative impact on organizational development. This indicates that, while AI theory is essential for technological advancement, an overemphasis on theoretical knowledge without practical application or integration may hinder organizational growth. Organizations that focus too much on the theoretical aspects of AI may face challenges in translating this knowledge into real-world improvements, potentially slowing down innovation and development."

1. The Influence of Decision-Making on Organizational Development

The research findings indicate that quantitative-based decision-making has a significant impact on organizational growth (Camm et al., 2023). This approach allows organizations to use data and statistical analysis as the foundation for making decisions, leading to more accurate and reliable outcomes. In the era of Industry 4.0, the role of technology, particularly artificial intelligence (AI), has become increasingly crucial in supporting real-time decision-making. AI enables organizations to respond quickly and effectively to market changes, providing the necessary flexibility to compete in a dynamic environment (Tyagi et al., 2023).

However, decision-making processes should not solely rely on technology; they must also take into account various important factors, such as the organization's strategic goals, core values, and the potential short-term and long-term impacts of the decisions made. Decisions can be made by individuals or groups, depending on the complexity of the problem and the level of involvement

required. Nevertheless, decision-making is not an easy process, as each decision carries certain risks that can affect the sustainability of the organization.

The availability of adequate facilities and supporting tools in the decision-making process is crucial for minimizing these risks and improving decision-making effectiveness. These facilities include advanced technologies such as AI, management information systems, and clear decision-making frameworks. When carried out effectively, the impact of this process not only improves the quality of decisions but also accelerates organizational growth and strengthens competitiveness in the market. Therefore, structured, data-driven decision-making, supported by modern technology, can be a key factor in driving sustainable company development.

2. The Influence of AI on Organizational Development

Artificial Intelligence (AI) has emerged as a transformative technology, significantly influencing organizational development across various industries. AI's ability to process large volumes of data and extract meaningful insights is reshaping how organizations operate, make decisions, and engage with customers (Brynjolfsson & McAfee, 2017). By leveraging AI, organizations can automate repetitive tasks, optimize processes, and provide more personalized experiences to customers, which ultimately leads to increased efficiency and productivity.

In the context of decision-making, AI can enhance both the speed and accuracy of decisions. Machine learning algorithms, for instance, can analyze historical data and identify patterns that may not be immediately apparent to human decision-makers. This

capability allows organizations to make more informed decisions, reduce uncertainty, and better anticipate future trends (Chui et al., 2018). Additionally, AI's ability to support predictive analytics further empowers organizations to identify opportunities and mitigate risks before they arise, fostering proactive decision-making and a forward-thinking organizational culture.

However, the integration of AI into organizational processes also comes with challenges. One key challenge is ensuring that AI systems are aligned with the organization's strategic goals and values. Organizations need to have a clear understanding of how AI can be used to complement human judgment and expertise, rather than replace it. Moreover, organizations must also address ethical concerns, such as data privacy and bias in AI algorithms, to ensure that AI implementation does not inadvertently harm their reputation or stakeholder trust.

Despite these challenges, the potential benefits of AI in organizational development are immense. By embracing AI, organizations can streamline operations, enhance customer satisfaction, foster innovation, and ultimately, improve their competitiveness in an increasingly complex and technology-driven market. Therefore, organizations that effectively harness AI's capabilities are likely to experience long-term growth and success.

Despite the great potential of Artificial Intelligence (AI) to enhance organizational performance, a lack of thorough understanding of its theoretical application can lead to significant negative impacts (Borissova, 2024). In addressing this challenge, organizations must strive to maximize AI integration in a way that supports practical and relevant solutions. AI

is currently transforming organizational paradigms across various industries, creating significant opportunities as well as new challenges. With its ability to simplify processes, automate tasks, and provide valuable insights from data, AI has the potential to revolutionize how organizations operate.

The benefits of AI implementation include increased efficiency, time savings, and better decision-making based on in-depth data analysis. In the context of organizational development, AI also serves as a highly effective tool in supporting sustainable change management. However, the successful implementation of AI requires a planned and structured approach. Organizations must adopt clear guidelines, provide adequate instructions to team members, and continuously monitor AI deployment to ensure optimal results.

The role of leadership in this transformation era has become increasingly important. Organizational leaders must be able to adapt to the changes brought about by AI technology, develop new skills, and understand the relevant concepts and regulations. They must also take a cautious approach, ensuring that AI implementation aligns with the organization's strategic goals while considering the ethical aspects and its impact on human resources.

Additionally, ongoing education and training for organizational members become key factors in preparing teams to face the evolving dynamics of AI technology (Ramadhan & Nasution, 2024). Organizations also need to continuously monitor advancements in AI technology to remain competitive and relevant in an increasingly dynamic market. Through this strategy, AI not only becomes a tool for improving operational efficiency but also

provides a significant competitive edge for organizations in the long run.

Conclusion

The research findings highlight that both decision-making and understanding of Artificial Intelligence (AI) significantly impact organizational development, albeit in different ways. Data-driven decision-making has a notably positive effect on growth, emphasizing the importance of a quantitative approach for sustainable organizational development. In contrast, a lack of a comprehensive understanding of AI theory has a significant negative impact, underscoring the need for a solid grasp of AI to fully reap its benefits. Organizations that effectively leverage AI can improve efficiency, automation, and real-time decision-making, enhancing flexibility and competitiveness in a rapidly evolving market. However, careful implementation, clear guidelines, continuous training, and monitoring are essential to mitigate potential risks. With strategic planning and adaptive leadership, AI can be a key tool for accelerating growth and achieving a competitive edge in the Industry 4.0 era.

Recommendation

1. **Utilizing a quantitative approach and Industry 4.0 technologies to support decision-making.**

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Leveraging data-driven methods and advanced technologies, such as AI, IoT, and big data analytics, can significantly enhance the decision-making process. These technologies enable organizations to analyze large datasets efficiently, identify patterns, and make well-informed decisions that support long-term growth and competitiveness.

2. **Enhancing AI implementation training.**

Providing comprehensive and ongoing training programs for employees ensures that they have the necessary skills to effectively utilize AI tools. This not only improves the technical proficiency of the workforce but also fosters a culture of innovation and adaptability within the organization, which is crucial for successful AI integration.

3. **Integrating logical, data-driven, and emotional factors into decision-making.**

Effective decision-making involves balancing both analytical and emotional considerations. By integrating data and logical analysis with an understanding of human emotions and organizational culture, leaders can make more empathetic and well-rounded decisions that consider the impacts on all stakeholders, ensuring better outcomes for the organization.

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