

Research Proposal

Everyone's Smart University

College of Management

Master of Project Management

Title:

The Impact of Using Artificial Intelligence Techniques on the Performance of Projects in the Kingdom of Saudi Arabia

عنوان البحث:

أثر استخدام تقنيات الذكاء الاصطناعي على أداء إدارة المشاريع في المملكة العربية
السعودية

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1. Introduction

The fourth industrial revolution has brought about significant advancements in various industries, and artificial intelligence (AI) has emerged as a crucial component of this transformation. According to (Russel and Norvig, 2003), AI refers to computer systems that replicate cognitive functions typically associated with human attributes, such as learning, speech, problem-solving, visual perception, natural language understanding, and decision-making. These systems are capable of performing these tasks either partially or fully autonomously (Smith, et al., 2006). In the Middle East, governments and businesses are increasingly recognizing the global shift towards AI and advanced technologies, driven by the fourth industrial revolution. They face a critical choice between embracing this technological disruption or risk being left behind. Considering the significant economic impact of being left behind, it becomes imperative for the region to actively participate in this transformation. It is estimated that the Middle East is projected to capture 2% of the total global benefits of AI by 2030, amounting to a substantial value of US\$320 billion. As a result, several nations in the Middle East, including Saudi Arabia, the United Arab Emirates, Kuwait, Jordan, and Turkey, are particularly eager to compete in this domain (Al-Mousa, et al., 2022).

The Kingdom of Saudi Arabia has experienced substantial economic growth and development in recent decades, leading to an upsurge in large-scale projects across various sectors. To enhance project performance, organizations are increasingly exploring emerging technologies such as artificial intelligence. AI techniques, including machine learning, natural language processing, and data analytics, have the potential to revolutionize project management by improving decision-making processes, optimizing resource allocation, and mitigating risks (Alshehri, 2019). Therefore, the

objective of this research is to investigate the impact of AI techniques on project performance in Saudi Arabia, thereby contributing to the advancement of project management practices in the region.

1.1. Research Problem:

The research problem to be investigated in this study is to determine the extent to which the utilization of artificial intelligence (AI) techniques affects the performance of projects in the Kingdom of Saudi Arabia. Specifically, the study aims to address the following research questions:

- 1) What is the current level of adoption of artificial intelligence techniques in project management practices in the Kingdom of Saudi Arabia?
- 2) What are the key factors influencing the successful implementation of AI techniques in project management in the Kingdom of Saudi Arabia?
- 3) What are the potential benefits and challenges associated with the use of AI techniques in improving project performance in the Kingdom of Saudi Arabia?
- 4) How do project managers and stakeholders perceive the impact of AI techniques on project performance in the Kingdom of Saudi Arabia?
- 5) What are the best practices and recommendations for incorporating AI techniques effectively into project management processes in the Kingdom of Saudi Arabia?

By addressing these research questions, this study aims to provide insights into the impact of using AI techniques on project performance in the Kingdom of Saudi Arabia, which can help inform project managers, stakeholders, and policymakers in effectively utilizing AI in project management practices.

1.2. Research Importance:

The proposed research aims to investigate the impact of utilizing artificial intelligence (AI) techniques on project performance within the context of the Kingdom of Saudi Arabia (KSA). This research is of significant importance for several reasons. Firstly, the Kingdom of Saudi Arabia has been actively pursuing economic diversification and modernization through its Vision 2030 initiative. As part of this initiative, there is a growing emphasis on leveraging emerging technologies such as AI to enhance various sectors, including project management. Therefore, understanding the implications of using AI techniques in project management within the KSA is crucial for policymakers, project managers, and stakeholders involved in the country's development. Secondly, the utilization of AI techniques in project management has gained increasing attention globally due to its potential to improve project outcomes, including efficiency, cost-effectiveness, and overall performance. However, the specific impact of AI techniques on project performance in the unique context of the KSA remains relatively unexplored. Consequently, this research will contribute to the existing body of knowledge by filling this gap and providing insights into the applicability and effectiveness of AI techniques in the Saudi Arabian project management context. Thirdly, given the diverse nature of projects undertaken in the Kingdom of Saudi Arabia, ranging from infrastructure development to industrial ventures, understanding how AI techniques can enhance project performance is crucial for ensuring successful project delivery. The findings of this research will provide evidence-based recommendations and guidelines for project managers and organizations in the KSA to effectively incorporate AI techniques into their project management practices, ultimately leading to improved project outcomes and overall project success rates. Furthermore, the research will contribute to the broader field of project management by enriching the existing literature on the impact of AI techniques on project

performance. As AI continues to evolve and influence various aspects of society, understanding its specific implications in the project management domain will contribute to advancing knowledge in this field. The research findings will also facilitate the identification of best practices and potential challenges associated with integrating AI techniques into project management processes, thereby benefiting practitioners and researchers globally.

1.3. Research Aims and Objectives:

The main aim of this research is to investigate the impact of utilizing artificial intelligence techniques on the performance of projects in the Kingdom of Saudi Arabia, and from this main aim, several specific objectives can be achieved as the following:

- To examine the various artificial intelligence techniques and their potential applications in project management.
- To identify the key factors that influence the performance of projects in the Kingdom of Saudi Arabia.
- To analyze the impact of integrating artificial intelligence techniques on project performance indicators, such as cost, time, and quality.
- To evaluate the challenges and barriers associated with implementing artificial intelligence techniques in project management in the Kingdom of Saudi Arabia.
- To develop recommendations and guidelines for the effective utilization of artificial intelligence techniques to enhance project performance in the Kingdom of Saudi Arabia.

- To offer practical implications for project managers, policymakers, and other stakeholders involved in the project management domain in Saudi Arabia, highlighting the potential benefits and limitations of employing artificial intelligence techniques.

1.4. Research hypothesis:

2. **Hypothesis 1:** The utilization of artificial intelligence techniques positively impacts the overall performance of projects in the Kingdom of Saudi Arabia.
3. **Hypothesis 2:** The adoption of artificial intelligence techniques in project management processes enhances decision-making capabilities, leading to improved project outcomes in the Kingdom of Saudi Arabia.
4. **Hypothesis 3:** The implementation of artificial intelligence techniques in project management practices contributes to enhanced risk management and mitigation strategies in the Kingdom of Saudi Arabia. AI-powered risk assessment, predictive modeling, and anomaly detection systems enable project teams to identify and proactively address potential risks and uncertainties, leading to reduced project failure rates, improved resource allocation, and enhanced project resilience in the face of unforeseen challenges.

2. Literature Review

This literature review has provided an overview of existing research on the impact of using AI techniques on the performance of projects, with a specific focus on the Kingdom of Saudi Arabia. The findings suggest that AI techniques have the potential to significantly enhance various aspects of project management, including planning, scheduling, risk management, decision-making, and communication. However, further research is needed to address the unique challenges and opportunities associated with the application of AI techniques in the Saudi Arabian context. By bridging these gaps, future studies can contribute to the advancement of project management practices in Saudi Arabia and facilitate the successful integration of AI techniques for improved project performance.

2.2. Artificial Intelligence in Project Performance

The utilization of artificial intelligence (AI) techniques has witnessed significant growth and application across various domains, including project management. The Kingdom of Saudi Arabia (KSA) has experienced rapid economic development, leading to an increase in the number and complexity of projects undertaken in the region. As a result, there is a growing interest in exploring the potential impact of AI techniques on enhancing project performance in Saudi Arabia (Nader, et al., 2022). This literature review aims to provide an overview of existing research on the impact of using AI techniques in project management, with a specific focus on the context of the Kingdom of Saudi Arabia.

2.3. Overview of Artificial Intelligence Techniques in Project Management

Artificial intelligence techniques encompass a range of technologies that enable machines to simulate human intelligence and perform tasks that typically require human cognitive abilities. In the context of project management, AI techniques offer the potential to improve various aspects, including project planning, scheduling, risk management, decision-making, and resource allocation. These techniques typically involve the application of machine learning algorithms, natural language processing, expert systems, and data analytics (Al-Otaibi, et al., 2021)

2.4. Impact of AI Techniques on Project Performance

Several studies have explored the impact of AI techniques on project performance, both in a general context and within specific industries. AI techniques have been shown to enhance project planning and scheduling by optimizing resource allocation, predicting project timelines, and identifying critical paths. These techniques can also improve risk management by analyzing historical project data, identifying potential risks, and providing recommendations for mitigation strategies.

Moreover, AI techniques contribute to better decision-making through the analysis of vast amounts of project-related data, identifying patterns and trends, and generating insights to support informed decision-making. Additionally, the use of AI techniques in project management facilitates improved communication and collaboration among project team members, enhancing overall project performance (Alharbi, et al., 2020).

2.5. Application of AI Techniques in the Kingdom of Saudi Arabia

In recent years, the Kingdom of Saudi Arabia has witnessed a surge in large-scale infrastructure projects, such as transportation networks, smart cities, and energy initiatives. Consequently, there is a growing interest in leveraging AI techniques to enhance project performance in the country (Alghamdi, et al., 2021). Several initiatives and organizations in Saudi Arabia have started exploring the potential of AI in project management, highlighting the importance of understanding its impact on project performance within the Saudi Arabian context. However, the application of AI techniques in the Kingdom of Saudi Arabia presents unique challenges, including cultural factors, regulatory frameworks, and the availability of skilled professionals. Therefore, it is crucial to investigate how AI techniques can be effectively implemented and integrated into project management practices in Saudi Arabia, considering the local context and specific challenges (Alrashed, et al., 2021).

2.6. Research Gaps and Future Directions

While existing research has provided insights into the impact of AI techniques on project performance, there is still a need for further investigation within the context of the Kingdom of Saudi Arabia. Specifically, research is required to identify the specific challenges and opportunities associated with implementing AI techniques in project management practices in Saudi Arabia. Additionally, understanding the cultural, organizational, and technological factors that may influence the adoption and successful utilization of AI techniques in the Saudi Arabian context is essential. Furthermore, future studies could focus on evaluating the effectiveness of different AI techniques in different project types and industries within Saudi Arabia. Comparative studies can shed light on the strengths and

limitations of various AI techniques and provide guidelines for selecting and implementing the most suitable approaches in different project scenarios.

Research Methodology:

To achieve the research objectives, the study will adopt a mixed-methods approach, combining qualitative and quantitative research methods. The research will consist of the following steps:

- **Literature Review:** A comprehensive review of existing literature on AI adoption in project management will be conducted to establish the theoretical framework and identify research gaps.
- **Data Collection:** Primary data will be collected through surveys and interviews with project managers, practitioners, and stakeholders involved in projects across different sectors in KSA. The data will be collected on project performance metrics, AI adoption practices, and perceived benefits and challenges.
- **Data Analysis:** The quantitative data collected through surveys will be analysed using statistical techniques such as regression analysis to examine the relationship between AI adoption and project performance. The qualitative data from interviews will be analysed using thematic analysis to identify common themes, challenges, and opportunities.
- **Findings and Recommendations:** The findings will be presented, and conclusions will be drawn based on the analysis. Recommendations for project practitioners and policymakers in KSA will be provided, highlighting strategies for effectively implementing AI techniques in project management.

Research Limits:

- 1) **Geographic Scope:** This research focuses specifically on the Kingdom of Saudi Arabia (KSA) and does not explore the impact of using artificial intelligence (AI) techniques on project performance in other countries or regions.
- 2) **Project Types:** The research primarily investigates the impact of AI techniques on project performance in the KSA, however, it does not differentiate between various types of projects. The study does not delve into specific sectors or industries but considers projects in a broader context.
- 3) **Time Frame:** The research focuses on the impact of AI techniques on project performance up until the knowledge of 2023.
- 4) **Research Design:** The research adopts a quantitative research approach using surveys and statistical analysis to investigate the impact of AI techniques on project performance.
- 5) **External Factors:** The research recognizes that the impact of using AI techniques on project performance can be influenced by external factors beyond the scope of the study, such as economic conditions, regulatory frameworks, and geopolitical factors. While the study attempts to control for these factors by focusing on projects within the Kingdom of Saudi Arabia, it does not explicitly examine their influence on the relationship between AI adoption and project performance.
- 6) **Ethical Considerations:** While this research primarily focuses on the impact of AI techniques on project performance, it is essential to acknowledge and address the ethical considerations

associated with the use of AI in project management. These considerations include privacy and data protection.

Conclusion

In conclusion, the research on the impact of using artificial intelligence (AI) techniques on the performance of projects in the Kingdom of Saudi Arabia demonstrates the significant potential and benefits that AI brings to project management. One key advantage of AI in project management is its ability to automate routine tasks, thereby reducing human error and increasing productivity. AI-powered tools and algorithms can handle complex calculations, data analysis, and predictive modeling, allowing project managers to focus on strategic planning and problem-solving. This automation leads to faster project execution, reduced costs, and enhanced resource allocation. Furthermore, AI techniques enable better risk assessment and mitigation strategies. AI algorithms can analyze vast amounts of project data, identify patterns, and predict potential risks and challenges. This allows project managers to proactively address issues before they escalate, leading to better risk management and project outcomes.

Perception of Research Structure:

1. Introduction
2. Literature Review
3. Research Methodology
4. Results
5. Discussion and Recommendations
6. Conclusion
7. References

Research Timeline:

Activity	July - August 2023	August 2023	Septemb er 2023
Reading related paper, books, and case studies.			
Methodology design and relevant data Collection, field research will be conducted, and model analysis will be performed.			
Paper writing and completion of first draft.			
Adjustment, proof reading and completion of final draft.			

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