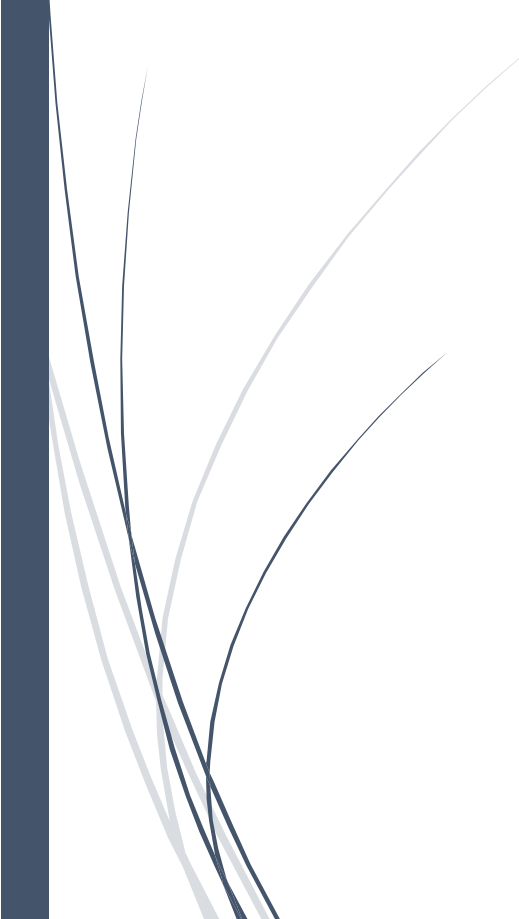




Final Project 2

PMG 497

Project Template



Project title

**The Role of Artificial Intelligence in Managing Project
Risks in Companies**

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1.Chapter 2: Literature Review

1.1. Introduction

The rapid advancement of digital technologies has significantly reshaped modern project management practices, particularly in the area of project risk management. Among these technologies, artificial intelligence has gained increasing attention due to its ability to process large volumes of data, recognize patterns, and support predictive decision-making. This chapter reviews the relevant literature related to artificial intelligence and project risk management, with the objective of establishing a theoretical foundation for examining the role of AI in managing project risks in companies.

The literature review is structured around three main areas. First, it discusses the concept and applications of artificial intelligence as an independent variable. Second, it examines project risk management as a dependent variable. Third, it reviews existing studies that explore the relationship between artificial intelligence and project risk management. This review highlights key findings, identifies gaps in the literature, and supports the development of the study's hypotheses.

1.2. The independent variable

Artificial intelligence refers to the capability of computer systems to perform tasks that typically require human intelligence, such as learning, reasoning, problem-solving, and decision-making. AI technologies include machine learning algorithms, neural networks, expert systems, natural language processing, and predictive analytics. In organizational contexts, AI has been widely adopted to enhance efficiency, accuracy, and responsiveness across various business functions.

In project management, artificial intelligence is increasingly used to support planning, scheduling, monitoring, and risk management activities. According to Marnewick and Marnewick (2020), AI-enabled project management tools can analyze historical project data to predict potential risks and recommend appropriate mitigation strategies. These tools reduce reliance on subjective judgment and enable more data-driven decision-making.

Machine learning, as a core component of artificial intelligence, plays a significant role in identifying risk patterns based on past project performance. By continuously learning from new data, machine learning models improve their predictive accuracy over time. Bughin et al. (2018) emphasize that AI-driven analytics enhance organizational capability to anticipate uncertainties and respond proactively to potential risks.

Moreover, artificial intelligence supports real-time monitoring of project performance indicators, enabling early detection of deviations from planned objectives. This capability allows project managers to address emerging risks before they escalate into critical issues. As a result, AI contributes to improved project control and risk governance within companies.

1.3. The dependent variable

Project risk management is a systematic process that involves identifying, analyzing, responding to, and monitoring risks throughout the project life cycle. The primary objective of project risk management is to minimize the negative impact of uncertainties on project objectives related to scope, time, cost, and quality. Effective risk management enhances project success and organizational performance.

Traditional project risk management approaches rely heavily on qualitative techniques such as risk checklists, expert judgment, and probability-impact matrices. While these methods provide valuable insights, they may be insufficient in complex and dynamic project environments. Kerzner (2022) argues that traditional risk management practices often fail to capture emerging and interconnected risks, particularly in large-scale and technologically advanced projects.

Recent studies highlight the importance of integrating advanced analytical tools into project risk management processes. AI-based systems enhance risk identification by analyzing diverse data sources, including historical project records, market trends, and operational data. This enables organizations to move from reactive risk management to proactive and predictive risk management practices.

Effective project risk management also requires continuous monitoring and reassessment of risks. AI technologies facilitate this process by providing real-time insights and automated alerts, enabling timely risk response and mitigation. As a result, organizations can improve decision-making quality and reduce the likelihood of project failure.

1.4. The relationship between the independent and the dependent variables

The relationship between artificial intelligence and project risk management has attracted growing scholarly interest. Several studies suggest that artificial intelligence enhances the effectiveness of project risk management by improving risk identification, analysis, and mitigation processes. AI-driven tools enable organizations to process complex datasets and identify hidden risk patterns that may not be detectable through traditional methods.

Wamba et al. (2020) argue that artificial intelligence significantly improves risk analysis accuracy by incorporating predictive and prescriptive analytics. These capabilities allow project managers to evaluate multiple risk scenarios and select optimal response strategies. Furthermore, AI supports simulation and forecasting techniques that help organizations anticipate the potential impact of risks on project outcomes.

Empirical studies indicate that companies adopting AI in project management experience improved risk visibility and decision-making speed. However, the effectiveness of AI implementation depends on factors such as data quality, technological infrastructure, and

employee skills. Organizations that lack these capabilities may face challenges in fully realizing the benefits of AI-driven risk management.

Overall, the literature suggests a positive relationship between artificial intelligence and project risk management effectiveness. Nevertheless, there remains a need for empirical research that quantitatively examines this relationship within companies, particularly from the perspective of employees and managers involved in project activities.

1.5. Conclusion

This chapter reviewed the existing literature on artificial intelligence and project risk management. The reviewed studies indicate that artificial intelligence plays a crucial role in enhancing risk identification, analysis, and mitigation processes. AI-driven tools support proactive and data-driven risk management practices, enabling organizations to better manage uncertainties and improve project outcomes.

Despite the growing body of literature, gaps remain regarding the empirical evaluation of AI's role in project risk management within companies. These gaps justify the need for the current study and provide a foundation for the research methodology discussed in the next chapter.

References – Section 2

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