

Midocean University

Faculty of Management

Project Management

The Impact of AI-Powered Tools Training on Managerial Efficiency in Majan Construction Company

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Graduation Project – 1

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1. Chapter 1: Introduction

1.1. Research Background

In the past 10 years, state-of-the-art technologies such as artificial intelligence (AI), data analytics, and machine learning tools have revolutionized the performance of organizations from top to bottom across business functions (Hwang & Kim, 2021). The extensive implementation of such technologies within firms generates higher effectiveness, increases efficiency, and drives overall productivity (Czarnitzki et al., 2023; Damioli et al., 2021). Although there's growing interest in how AI is being used in construction, we still know very little about how structured training in AI tools actually affects managers on the ground. Specifically, it's unclear how such training might influence their decision-making speed, ability to automate tasks, or improve planning.

As Gounde and Olusegun (2024) argue, the effectiveness of AI adoption is often limited by a lack of digital training and preparedness among managers. This study aims to fill that gap by looking at how training in AI tools affects real-world performance among managers at Majan Construction Company. Using a mixed-method approach, we'll compare key performance metrics before and after the training. We'll also gather feedback from participants to get a clearer picture of how AI training plays out in everyday construction management.

1.2. Research Problem

AI tools offer real benefits in construction management, but many managers aren't trained to use them effectively. At Majan Construction Company, this gap means valuable tools may be underused. This study looks at whether training can help managers use AI tools more confidently and improve their overall efficiency.

1.2.1. Theoretical Gaps

Most research on AI in construction tends to focus on what the technology can do, rather than how managers actually learn to use it. There's not much theory linking AI adoption to real-world issues like training, behavior change, or decision-making. This study looks to fill that gap by examining how training affects managers' ability to use AI tools effectively.

1.2.2. Practical Gaps

AI tools are available, but many managers aren't trained to use them effectively. At Majan Construction Company, this limits their impact. There's a need for practical training to bridge the gap between having the tools and using them well.

How does training in AI-powered tools affect managerial efficiency at Majan Construction Company?

1.3. Research Significance

AI tools can make a big difference in how construction projects are managed—but only if people know how to use them. This research matters because it looks beyond the technology and focuses on the people using it. By exploring how training helps managers at Majan Construction Company work more efficiently with AI, the study offers practical insights for other companies facing the same challenge. It shows that investing in people is just as important as investing in tools.

1.3.1. At the theoretical level

At the heart of this research is a simple idea: even the smartest technology needs people who know how to use it. While a lot of theory talks about what AI can do, not enough attention is given to how managers actually learn to use it and apply it in their daily work. This study brings a human-centered view to the conversation by showing that training plays a key role in turning potential into real impact. It adds to the theory by connecting AI tools not just to systems and outcomes but to people.

1.3.2. At the practical level

On a practical level, this research helps companies like Majan Construction Company get more out of the AI tools they already have. It focuses on the real-world challenge many organizations face: giving managers the training they need to confidently use new technology. By showing how the right training can improve decision-making and efficiency, this study offers clear, useful guidance for companies that want to make their digital investments pay off.

1.4. Research Questions

- How does AI-powered tool training impact the time managers take to make project-related decisions at Majan Construction Company?
- What is the change in the percentage of routine tasks automated by managers after receiving AI training?
- To what extent do managers apply AI tools in their daily tasks within three months of completing the training?

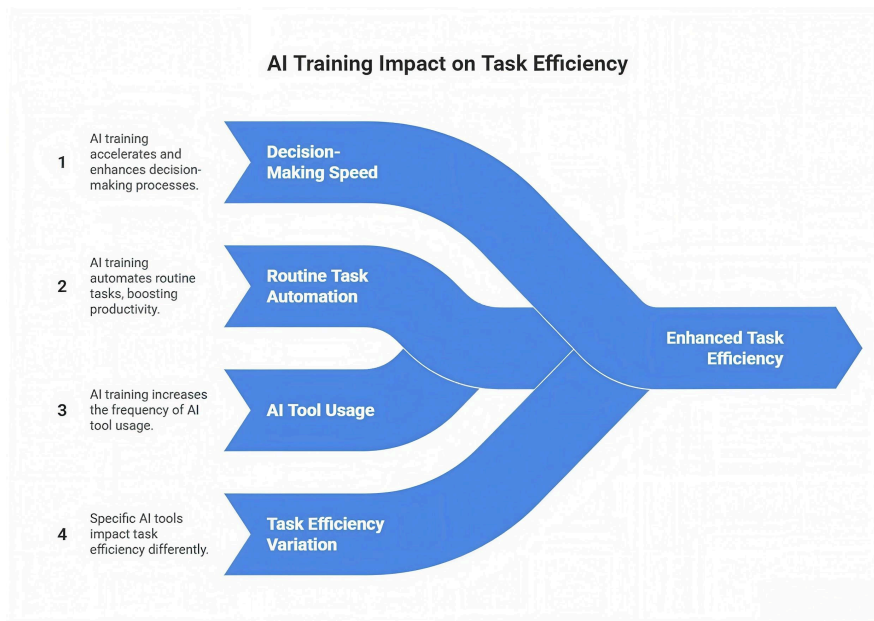
1.5. Research Objectives

- To determine the impact of AI-powered tool training on the speed and accuracy of managerial decision-making at Majan Construction Company.
- To analyze changes in the percentage of routine tasks automated by managers following AI training.
- To assess the frequency and consistency with which managers apply AI tools in their daily work after completing the training.
- To identify which AI-powered tools introduced during training are most frequently used by managers and how they contribute to task efficiency.

1.6. Research Hypotheses

- There is a statistically significant **positive relationship** between AI-powered tools training and managerial decision-making speed and accuracy at Majan Construction Company.
- There is a statistically significant **positive relationship** between AI-powered tools training and the percentage of routine tasks automated by managers.
- There is a statistically significant **positive relationship** between AI-powered tools training and the frequency of AI tool usage by managers within three months of training.
- There is a statistically significant relationship between the type of AI-powered tools introduced during training and the level of task efficiency achieved by managers.

1.7. Research Model



1.8. Empirical Study

This research will be conducted at **Majan Construction Company**, a mid-sized firm operating in the construction sector. The setting is highly relevant to the research topic, as the company is in the process of integrating AI-powered tools into its management practices but has not yet implemented formal training programs for its managers. This makes it a practical environment for studying the effects of AI training on managerial efficiency.

The researcher has direct access to the organization's managers, with support from HR and executive leadership, enabling smooth implementation of surveys, performance tracking, and post-training interviews. All ethical considerations will be observed, including obtaining informed consent, ensuring confidentiality, and respecting participants' right to withdraw at any time.

Majan Construction Company is also representative of many similar-sized construction firms in the region, facing the same digital transformation challenges. Thus, findings from this study can offer insights that are generalizable to other companies in the industry that are also navigating the integration of AI into management.

1.9. Research Methodology

1. Research Philosophy: Positivism

This study adopts a positivist philosophy, as it seeks to test hypotheses through measurable data and statistically analyze the effects of AI-powered tools training on managerial efficiency. Positivism aligns with the goal of objectively assessing training outcomes using pre-defined metrics.

2. Research Approach: Deductive

The research follows a deductive approach. It starts with established theories about the relationship between training and managerial performance, and then tests specific hypotheses about how AI tool training affects decision-making, automation, and tool usage at Majan Construction Company.

3. Research Strategy: Case Study

A case study strategy is employed, focusing on a single organization—Majan Construction Company. This allows for a detailed, contextual investigation of training impacts in a real-world managerial setting.

4. Research Choice: Mixed Methods

A mixed methods approach will be used. Quantitative data (e.g., pre- and post-training performance metrics, frequency of AI tool usage) will be collected through structured surveys. Qualitative data (e.g., manager feedback on training experiences and challenges) will be gathered through semi-structured interviews.

5. Time Horizon: Cross-Sectional

The study uses a cross-sectional design, collecting data at two points in time (before and after training) to compare changes in managerial efficiency.

6. Data Collection and Analysis Techniques

a. Data Collection

- Quantitative: Online or paper-based surveys measuring KPIs such as decision-making time, task automation rate, and AI tool usage frequency.
- Qualitative: Semi-structured interviews to explore perceptions, barriers, and adoption experiences.

b. Data Analysis

- Quantitative analysis: Descriptive statistics, paired t-tests, and regression analysis to test hypotheses.
- Qualitative analysis: Thematic analysis of interview responses to identify recurring patterns and insights related to tool adoption and efficiency.

1.10. The Suggested Project Structure

The study is organized into five main chapters, each contributing to a systematic and comprehensive exploration of the research topic :

- **Chapter 1: Introduction**

This chapter presents the research background, problem statement, theoretical and practical gaps, research significance, questions, objectives, hypotheses, research model, and methodology overview.

- **Chapter 2: Literature Review**

A review of relevant academic literature on the independent variable (AI-powered tools training), the dependent variable (managerial efficiency), and the relationship between them. It helps position the research within existing academic debates.

- **Chapter 3: Research Methodology**

This chapter outlines the research philosophy, approach, strategy, time horizon, and the methods used for data collection and analysis. It explains how the research was designed and conducted.

- **Chapter 4: Statistical Analysis**

This chapter presents the results of the quantitative analysis, including descriptive and inferential statistics used to test the research hypotheses.

- **Chapter 5: Findings, Discussion & Conclusion**

This final chapter discusses the key findings in relation to the research questions and objectives, provides practical and theoretical implications, and concludes with recommendations and suggestions for future research.

2. Chapter 2: Literature Review

2.1. Introduction

Brief introduction for the chapter

2.2. The independent variable

2.3. The dependent variable

2.4. The relationship between the independent and the dependent variables

2.5. Conclusion

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