

Thesis Title:
**Factors Influencing AI-Based Project Management and Its
Outcomes in Industrial Engineering Projects**
“Design and Consultancy Engineering Projects”

(Questionnaire)

Rev.00

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Factors Influencing AI-Based Project Management and Its Outcomes in Industrial Engineering Projects

"Design and Consultancy Engineering Projects"

العوامل المؤثرة في إدارة المشاريع القائمة على الذكاء الاصطناعي ومخرجاتها في المشاريع الهندسية الصناعية "

"المشاريع الهندسية التصميمية والاستشارية "

*This questionnaire is designed to collect empirical data to explore the factors influencing the **utilization of AI tools**, their role in **AI-based project management**, and the resulting **project outcomes in design and consultancy engineering projects in Saudi Arabia**.*

تم تصميم هذا الاستبيان لجمع رؤى شاملة حول العوامل المؤثرة على إدارة المشاريع القائمة على الذكاء الاصطناعي في مشاريع التصميم والاستشارات الهندسية في المملكة العربية السعودية.

Section 1: Demographic Information

1. **Position in Organization:** What is your role in design and consultancy projects within your organization?
 - o Top management
 - o Project Manager
 - o Project Engineer
 - o Engineer
 - o Other (please specify)
2. **Years of Experience:** How many years of experience do you have in managing design and consultancy projects?
 - o Less than 1 year
 - o 1–3 years
 - o 4–6 years
 - o 7–10 years
 - o Over 10 years
3. **Organization Size:** What is the size of your organization in terms of employees working on design and consultancy projects?
 - o Small (<50 employees)
 - o Medium (50–249 employees)
 - o Large (250+ employees)
4. **Level of Familiarity with AI Tools:** What is your level of familiarity with AI tools in design and consultancy project management?
 - o Not familiar
 - o Somewhat familiar
 - o Moderately familiar
 - o Highly familiar
5. **AI Tools Used:** What types of AI tools or software does your organization currently use in design and consultancy projects (if any)?
 - o Decision-making tools
 - o Quality tools

- o *Data Collection tools*
- o *Data Analysis tools*
- o *Risk Identification tools*
- o *Communication tools*
- o *Other (please specify)*

Section 2: Independent Variables

Data Privacy and Security

6. To what extent do concerns about data privacy and security influence the utilization of AI Tools in your organization?

- o Extremely effectively (over 75%)
- o Not at all (0%)
- o To a small extent (up to 25%)
- o To a moderate extent (26–50%)
- o To a great extent (51–75%)
- o To a very great extent (over 75%)

7. How effective are the current measures in your organization to secure data when using AI Tools?

- o Not effective at all (0%)
- o Slightly effective (up to 25%)
- o Moderately effective (26–50%)
- o Highly effective (51–75%)
- o Extremely effective (over 75%)

Resistance to Change

8. What level of resistance to AI utilization have you observed among your team?

- o No resistance at all (0%)
- o Minimal resistance (up to 25%)
- o Moderate resistance (26–50%)
- o Significant resistance (51–75%)
- o Extreme resistance (over 75%)

9. How does the rapid evolution of AI affect your organization's willingness to utilize AI Tools?

- o No impact (0%)

- o Small impact (up to 25%)
- o Moderate impact (26–50%)
- o Significant impact (51–75%)
- o Very significant impact (over 75%)

Cost of Implementation

10. To what extent do budget constraints hinder your organization's decision to utilize AI Tools?

- o Not at all (0%)
- o To a small extent (up to 25%)
- o To a moderate extent (26–50%)
- o To a great extent (51–75%)
- o To a very great extent (over 75%)

12. How does your organization balance the costs of AI implementation Tools with the expected benefits in design and consultancy projects?

- o Not effectively at all (0%)
- o Slightly effectively (up to 25%)
- o Moderately effectively (26–50%)
- o Highly effectively (51–75%)
- o Extremely effectively (over 75%)

Compatibility with Existing Infrastructure

12. How compatible are AI tools with your organization's current infrastructure?

- o Not compatible at all (0%)
- o Slightly compatible (up to 25%)
- o Moderately compatible (26–50%)
- o Highly compatible (51–75%)
- o Fully compatible (over 75%)

13. What challenges do you face in integrating AI with legacy systems?

- o No challenges (0%)
- o Minor challenges (up to 25%)
- o Moderate challenges (26–50%)

- o Significant challenges (51–75%)
- o Extreme challenges (over 75%)

Workforce Development

14. To what extent does the lack of technical skills hinder AI utilization?

- o Not at all (0%)
- o To a small extent (up to 25%)
- o To a moderate extent (26–50%)
- o To a great extent (51–75%)
- o To a very great extent (over 75%)

15. How effective are your organization's training programs in preparing staff to utilize AI tools?

- o Not effective at all (0%)
- o Slightly effective (up to 25%)
- o Moderately effective (26–50%)
- o Highly effective (51–75%)
- o Extremely effective (over 75%)

Ethical Considerations

16. How significant are ethical concerns (e.g., bias, transparency, accountability) in influencing AI tool utilization?

- o Not significant at all (0%)
- o Slightly significant (up to 25%)
- o Moderately significant (26–50%)
- o Highly significant (51–75%)
- o Extremely significant (over 75%)

17. What measures are taken to ensure ethical and responsible AI use in your organization?

- o No steps taken (0%)
- o Minimal steps taken (up to 25%)
- o Moderate steps taken (26–50%)
- o Significant steps taken (51–75%)
- o Extensive steps taken (over 75%)

Section 3: Mediating Variable; Project Management via Artificial Intelligence

18. To what extent have AI tools streamlined project management processes (e.g., scheduling, documentation)?

- ☐ Not at all (0%)
- ☐ To a small extent (up to 25%)
- ☐ To a moderate extent (26–50%)
- ☐ To a great extent (51–75%)
- ☐ To a very great extent (over 75%)

20. How effective are AI tools in improving resource allocation?

- ☐ Not effective at all (0%)
- ☐ Slightly effective (up to 25%)
- ☐ Moderately effective (26–50%)
- ☐ Highly effective (51–75%)
- ☐ Extremely effective (over 75%)

21. To what extent do AI tools support task prioritization and schedule management?

- ☐ Not at all (0%)
- ☐ To a small extent (up to 25%)
- ☐ To a moderate extent (26–50%)
- ☐ To a great extent (51–75%)
- ☐ To a very great extent (over 75%)

22. How effectively do AI tools assist in tracking and reporting project progress?

- ☐ Not effective at all (0%)
- ☐ Slightly effective (up to 25%)
- ☐ Moderately effective (26–50%)
- ☐ Highly effective (51–75%)

- o Extremely effective (over 75%)

23. How significant is the role of AI in improving communication and coordination among teams?

- o Not significant at all (0%)
- o Slightly significant (up to 25%)
- o Moderately significant (26–50%)
- o Highly significant (51–75%)
- o Extremely significant (over 75%)

24. To what extent do AI tools enhance forecasting and planning capabilities?

- o Not at all (0%)
- o To a small extent (up to 25%)
- o To a moderate extent (26–50%)
- o To a great extent (51–75%)
- o To a very great extent (over 75%)

Section 4: Dependent Variables

Enhancing Decision-Making

25. To what extent do AI tools improve decision-making accuracy?

- o Not at all (0%)
- o To a small extent (up to 25%)
- o To a moderate extent (26–50%)
- o To a great extent (51–75%)
- o To a very great extent (over 75%)

26. How do AI tools support data-informed decision-making and risk analysis?

- o No role (0%)
- o Minor role (up to 25%)
- o Moderate role (26–50%)
- o Significant role (51–75%)
- o Major role (over 75%)

Improving Project Quality

27. How significantly do AI tools contribute to delivering high-quality outputs in design and consultancy projects?

- ☐ Not significant at all (0%)
- ☐ Slightly significant (up to 25%)
- ☐ Moderately significant (26–50%)
- ☐ Highly significant (51–75%)
- ☐ Extremely significant (over 75%)

28. In what ways has AI improved your organization's project performance? (Check all that apply)

- ☐ Improving the accuracy of deliverables
- ☐ Reducing time to complete tasks
- ☐ Enhancing collaboration between team members
- ☐ Identifying and mitigating risks early

Data Collection Accuracy

29. To what extent have AI tools improved the accuracy of data collection?

- ☐ Not at all (0%)
- ☐ To a small extent (up to 25%)
- ☐ To a moderate extent (26–50%)
- ☐ To a great extent (51–75%)
- ☐ To a very great extent (over 75%)

30. How effectively do AI tools handle large datasets in design and consultancy projects?

- ☐ Not effective at all (0%)
- ☐ Slightly effective (up to 25%)
- ☐ Moderately effective (26–50%)
- ☐ Highly effective (51–75%)
- ☐ Extremely effective (over 75%)

Enhancing Data Analysis and Insights

31. How effectively do AI tools analyze project data and provide actionable insights in design and consultancy projects?

- ☐ Not effective at all (0%)
- ☐ Slightly effective (up to 25%)
- ☐ Moderately effective (26–50%)
- ☐ Highly effective (51–75%)
- ☐ Extremely effective (over 75%)

32. What role do AI tools play in identifying patterns that improve decision-making?

- ☐ No role (0%)
- ☐ Minor role (up to 25%)
- ☐ Moderate role (26–50%)
- ☐ Significant role (51–75%)
- ☐ Major role (over 75%)

Risk Identification Accuracy

33. How accurately do AI tools identify potential risks in design and consultancy projects?

- ☐ Not accurate at all (0%)
- ☐ Slightly accurate (up to 25%)
- ☐ Moderately accurate (26–50%)
- ☐ Highly accurate (51–75%)
- ☐ Extremely accurate (over 75%)

34. To what extent do AI tools support proactive risk mitigation in design and consultancy projects?

- ☐ Not at all (0%)
- ☐ To a small extent (up to 25%)
- ☐ To a moderate extent (26–50%)
- ☐ To a great extent (51–75%)
- ☐ To a very great extent (over 75%)

Saving Time for Project Managers

35. **To what extent do AI tools reduce the time spent on routine tasks in design and consultancy projects?**

- ☐ Not at all (0%)
- ☐ To a small extent (up to 25%)
- ☐ To a moderate extent (26–50%)
- ☐ To a great extent (51–75%)
- ☐ To a very great extent (over 75%)

36. **How effectively do AI tools free project managers to focus on strategic decision-making in design and consultancy projects?**

- ☐ Not effective at all (0%)
- ☐ Slightly effective (up to 25%)
- ☐ Moderately effective (26–50%)
- ☐ Highly effective (51–75%)
- ☐ Extremely effective (over 75%)

Effective Collaboration and Communication

- ☐ How effectively do AI tools improve team collaboration and stakeholder communication?
- ☐ Not effective at all (0%)
- ☐ Slightly effective (up to 25%)
- ☐ Moderately effective (26–50%)
- ☐ Highly effective (51–75%)
- ☐ Extremely effective (over 75%)

Section 5: Open-Ended Questions

37. What are the most significant challenges your organization faces in the **utilization of AI tools** in project management for design and consultancy engineering projects?

38. In your opinion, what changes—whether organizational, technical, or regulatory—would support more effective **utilization of AI-based project management**?
39. What tangible benefits has your organization experienced from utilizing **AI-based project management practices**?
40. What recommendations would you propose to enhance the **utilization and outcomes** of AI-based project management in the Saudi design and consultancy sector?
41. From your perspective, does **organization size**, sector type, or the demographic profile of project managers affect the **utilization or outcomes** of AI in project management? If yes, how?