

The Impact of Engineering Consulting Services on Project Success in Saudi Arabia

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Chapter 1: Introduction

1.1 Research Introduction

Engineering consulting services have become one of the most important professional services in modern construction and infrastructure development. These services include engineering design, technical consultation, project supervision, feasibility studies, risk management, quality assurance, contract administration, and technical support throughout the project life cycle. Engineering consultants provide knowledge and experience that help project owners make better decisions before and during project execution.

Saudi Arabia is experiencing rapid development through Vision 2030. Large projects such as NEOM, Qiddiya, Red Sea Global, Diriyah Gate, and major transport and housing projects require experienced engineering consultants. These consultants support planning, design, supervision, quality management, and compliance with regulations.

Engineering consultants reduce project risks by improving planning, communication, and decision-making. They also support project managers in controlling cost, schedule, and quality while ensuring that projects satisfy clients and stakeholders.

Despite these benefits, many projects still experience delays, cost overruns, quality problems, and communication challenges. These issues indicate that engineering consulting services do not always achieve the expected results. Therefore, this research investigates how engineering consulting services influence project success in Saudi Arabia.

The study focuses on four dimensions of engineering consulting services: technical expertise, service quality, communication effectiveness, and regulatory compliance. Project success is measured using schedule performance, cost performance, quality performance, and client satisfaction. The findings are expected to provide useful recommendations for engineering consulting firms, government organizations, contractors, and project owners.

Chapter 2: Literature Review

2.1 Introduction

This chapter reviews previous studies related to engineering consulting services and project success. The purpose of the literature review is to explain the main concepts used in this research and identify the relationship between engineering consulting services and successful project delivery. The review also identifies research gaps that justify the need for this study in Saudi Arabia.

Engineering consulting services have become increasingly important because construction projects are becoming larger and more complex. Organizations rely on engineering consultants to provide technical advice, improve planning, reduce risks, and support decision-making throughout the project life cycle.

2.2 Engineering Consulting Services

Engineering consulting services include professional engineering advice, design, planning, project supervision, technical studies, cost estimation, contract management, quality assurance, and risk management. According to previous studies, experienced engineering consultants improve communication between project stakeholders and reduce project uncertainty.

Technical expertise is considered one of the most valuable characteristics of engineering consultants. Engineers with strong technical knowledge can identify design problems before construction begins, reducing costly changes during project execution.

Service quality is another important factor. High-quality consulting services include timely communication, accurate technical reports, fast response to client requests, and continuous professional support.

Communication effectiveness allows consultants, contractors, clients, and government authorities to exchange information efficiently. Poor communication often results in misunderstandings, delays, and increased project costs.

Regulatory compliance is especially important in Saudi Arabia because engineering consultants must ensure projects comply with Saudi Building Code, environmental regulations, safety requirements, and municipal standards.

2.3 Project Success

Project success has traditionally been measured using the Iron Triangle: cost, time, and quality. Modern researchers also include customer satisfaction, stakeholder satisfaction, sustainability, and organizational benefits.

Cost performance measures whether projects remain within the approved budget. Schedule performance evaluates whether project activities finish on time. Quality performance measures compliance with technical specifications and customer requirements. Client satisfaction reflects the client's overall perception of project outcomes and consultant performance.

2.4 Relationship Between Engineering Consulting Services and Project Success

Many international studies report a positive relationship between engineering consulting services and project success. Engineering consultants contribute to better planning, more effective risk management, improved quality control, and enhanced communication.

Researchers argue that organizations with experienced engineering consultants experience fewer project delays and better financial performance. Consultants also help clients make informed decisions by providing accurate technical information throughout project implementation.

However, some studies indicate that engineering consulting services alone cannot guarantee project success. Other factors such as leadership, contractor capability, organizational culture, and stakeholder cooperation also influence project outcomes.

Within Saudi Arabia, relatively few studies investigate this relationship directly. Therefore, this research contributes to the existing literature by focusing specifically on engineering consulting services under the Vision 2030 environment.

2.5 Literature Gap

The literature review indicates several important research gaps. First, many previous studies focus on general project management rather than engineering consulting services. Second, most studies were conducted outside Saudi Arabia, limiting their applicability to local projects. Third, few researchers examine the combined influence of technical expertise, communication, service quality, and regulatory compliance on project success.

This study attempts to address these gaps by developing a conceptual model that measures engineering consulting services using multiple dimensions and evaluates their impact on project success in Saudi Arabia.

2.6 Conclusion

This chapter reviewed the concepts of engineering consulting services and project success. Previous studies generally support a positive relationship between consulting quality and successful project delivery. Nevertheless, additional research is required to understand this relationship within Saudi Arabia. The following chapter explains the research methodology used to test the proposed hypotheses.

Expanded Literature Review and Theoretical Framework

3.1 Previous Studies

Previous research has consistently shown that engineering consulting services contribute to better project outcomes. Studies published between 2020 and 2025 report that consultants improve project planning, technical decision-making, quality assurance, and stakeholder coordination. Researchers also found that experienced consultants reduce design errors and support better cost control. However, the reported level of impact varies depending on project size, organizational capability, and the experience of the consulting firm.

Several studies in the Gulf region indicate that communication between consultants, contractors, and clients is one of the strongest predictors of project success. Poor communication often leads to rework, delays, and disputes. In contrast, regular meetings, clear reporting, and transparent information sharing improve project performance.

Other researchers emphasize regulatory compliance. Engineering consultants who understand national codes and standards help organizations avoid legal problems, improve safety, and increase public confidence in infrastructure projects.

3.2 Theoretical Framework

This study is supported by stakeholder theory and project management theory. Stakeholder theory explains that projects succeed when the needs of different stakeholders are balanced through effective communication and collaboration. Project management theory explains that planning, monitoring, quality management, and risk management improve project performance. Engineering consultants support these activities by providing professional knowledge and technical advice throughout the project life cycle.

3.3 Conceptual Framework

Independent Variable:

Engineering Consulting Services

- Technical Expertise
- Service Quality
- Communication Effectiveness
- Regulatory Compliance



Dependent Variable:

Project Success

- Cost Performance
- Schedule Performance
- Quality Performance
- Client Satisfaction

3.4 Critical Discussion

Although most studies report positive findings, researchers also recognize limitations. Many investigations focus on one industry or one country, making it difficult to generalize the results. Some studies use small samples or measure project success only by cost and time. This research addresses these limitations by examining several dimensions of engineering consulting services together and by measuring project success using cost, time, quality, and client satisfaction.

3.5 Summary

The reviewed literature indicates that engineering consulting services play an important role in successful project delivery. Nevertheless, additional evidence is required from Saudi Arabia because Vision 2030 projects operate in a unique economic and regulatory environment. This study fills that gap by testing a conceptual model that links engineering consulting services with project success.

Table 3.1 Summary of Selected Literature

Author	Focus	Main Finding	Research Gap
PMI (2021)	Project management	Structured practices improve outcomes	Limited consulting focus
Kerzner (2022)	Leadership	Leadership supports project success	General PM perspective
Saunders et al. (2023)	Research methods	Supports quantitative studies	Not industry specific
Recent GCC studies	Engineering consulting	Communication and expertise improve delivery	Limited Saudi evidence

Chapter 3: Research Methodology

3.1 Introduction

This chapter explains the methodology used to examine the impact of engineering consulting services on project success in Saudi Arabia. It describes the research design, research onion, target population, sampling technique, data collection methods, types of data, operational definitions, statistical analysis procedures, and ethical considerations.

3.2 Research Design (Research Onion)

Research Philosophy: Positivism.

Research Approach: Deductive.

Methodological Choice: Quantitative.

Research Strategy: Survey.

Time Horizon: Cross-sectional.

Data Collection: Structured questionnaire.

These choices are appropriate because the study aims to test hypotheses using numerical data collected from professionals working in engineering consulting and construction projects.

3.3 Operational Definitions

Engineering Consulting Services: The quality of professional engineering support delivered to clients through technical expertise, service quality, communication, and regulatory compliance.

Project Success: The extent to which a project achieves its objectives in terms of cost, schedule, quality, and client satisfaction.

3.4 Research Population

The target population consists of engineers, engineering consultants, project managers, architects, construction managers, and project owners working in Saudi Arabia. These participants are selected because they have practical experience with engineering consulting services and project delivery.

3.5 Sampling Method and Sample Size

A non-probability convenience sampling technique will be used. Approximately 150–200 respondents will be invited to complete the questionnaire. This sample size is considered suitable for regression and correlation analysis in quantitative research.

3.6 Data Collection Method

Primary data will be collected through a structured questionnaire using a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Secondary data will be collected from books, peer-reviewed journal articles, conference papers, government reports, and professional publications.

3.7 Types of Data

Primary data are collected directly from respondents. Secondary data are obtained from existing academic and professional sources to support the literature review and research framework.

3.8 Statistical Analysis Procedures

The collected data will be analyzed using SPSS. Descriptive statistics such as frequencies, percentages, means, and standard deviations will summarize respondent characteristics. Reliability will be evaluated using Cronbach's Alpha. Pearson correlation will examine relationships between variables, while multiple regression analysis will test the proposed hypotheses.

3.9 Ethical Considerations

Participation is voluntary. Respondents will be informed about the purpose of the research and their responses will remain anonymous and confidential. Data will be used only for academic purposes.

3.10 Conclusion

The selected methodology provides a structured and reliable approach for examining the relationship between engineering consulting services and project success in Saudi Arabia.

Table 3.1 Operational Definitions

Variable	Definition	Measurement
Technical Expertise	Professional engineering knowledge	Likert items
Service Quality	Quality of consulting support	Likert items
Communication	Information sharing effectiveness	Likert items

Regulatory Compliance	Compliance with Saudi regulations	Likert items
Project Success	Cost, time, quality, client satisfaction	Likert items

Research Instruments, Questionnaire, Conceptual Framework and References

3.11 Conceptual Framework

Engineering Consulting Services

- Technical Expertise
- Service Quality
- Communication Effectiveness
- Regulatory Compliance



Project Success

- Cost Performance
- Schedule Performance
- Quality Performance
- Client Satisfaction

3.12 Research Onion (Text Representation)

Research Philosophy: Positivism

Research Approach: Deductive

Methodological Choice: Quantitative

Research Strategy: Survey

Time Horizon: Cross-sectional

Data Collection Technique: Questionnaire

Appendix A: Questionnaire

Scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

Section A: Demographic Information

- Gender
- Age
- Highest Education Level
- Years of Experience
- Current Job Position
- Type of Organization
- Industry Sector

Section B: Engineering Consulting Services

B1. Our engineering consultants demonstrate strong technical expertise.

B2. Consultants provide accurate engineering solutions.

B3. Consultants respond quickly to technical issues.

B4. Consultants communicate effectively with project stakeholders.

B5. Project meetings are conducted regularly.

B6. Engineering reports are clear and understandable.

B7. Consultants provide high-quality professional services.

B8. Consultants complete assigned work on time.

B9. Consultants understand Saudi regulations.

B10. Consultants ensure compliance with engineering standards.

B11. Consultants help reduce project risks.

B12. Consultants improve project planning.

B13. Consultants support quality management.

B14. Consultants cooperate effectively with contractors.

B15. Consultants provide useful recommendations.

B16. Overall, engineering consulting services meet organizational expectations.

Section C: Project Success

C1. The project was completed within budget.

- C2. The project was completed on schedule.
- C3. The final project quality met expectations.
- C4. The client was satisfied with project outcomes.
- C5. Stakeholders were satisfied with project performance.
- C6. The project achieved its objectives.
- C7. The project experienced few technical problems.
- C8. The project maintained effective communication.
- C9. The project complied with regulations.
- C10. The project team worked effectively together.
- C11. The project produced long-term organizational value.
- C12. Overall, the project was successful.

Table of Research Instruments

Variable	Dimensions	Items	Scale
Engineering Consulting Services	Technical Expertise, Service Quality, Communication, Regulatory Compliance	16	5-point Likert
Project Success	Cost, Time, Quality, Client Satisfaction	12	5-point Likert

APA 7 Reference List

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(Add 20–30 additional peer-reviewed journal references when preparing the final submission.)