

Final Project 2

PMG 497

Project Template

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Department/ Specialization: Project Management



Project title

**The Impact of Risk Management Practices on Project
Success in the Construction Sector**

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Dedication

This project is lovingly dedicated to my beloved family, whose patience, love, and encouragement have been my constant source of strength.

To my parents, for their endless prayers and unwavering belief in me.

To my wife, for her support, understanding, and inspiration throughout this academic journey.

And to my wonderful children, who are my greatest motivation and joy in life.

Abstract

This study examined the impact of risk management practices on project success in the construction sector in Saudi Arabia. The research focused on three key dimensions of risk management: risk identification, risk assessment, and risk mitigation, and their influence on project success. A quantitative research approach was adopted, using a structured questionnaire to collect data from construction professionals, including project managers, engineers, supervisors, and coordinators. A total of 200 valid responses were analyzed using descriptive statistics, reliability analysis, and multiple linear regression techniques.

The findings revealed that all three risk management practices have a significant and positive effect on project success. Risk assessment demonstrated the strongest influence, followed by risk mitigation and risk identification. The regression model explained 62% of the variance in project success, indicating a strong predictive capability of structured risk management practices. The results highlight the importance of systematic risk identification, comprehensive assessment procedures, and effective mitigation strategies in improving project performance and achieving successful outcomes.

This study contributes to the existing body of knowledge by providing empirical evidence from the Saudi construction sector and offers practical insights for project practitioners. The findings emphasize the need for organizations to integrate formal risk management frameworks into their project management processes to enhance project success and sustainability.

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3. Chapter 3: Research Methodology

3.1. Introduction

This chapter presents the research methodology adopted to investigate the impact of risk management practices on project success in the construction sector in Saudi Arabia. The methodology outlines the systematic plan used to collect, analyze, and interpret data to answer the research questions and test the hypotheses developed in Chapter One.

The study adopts a quantitative approach, as the research aims to establish measurable relationships between the independent variables—risk management practices (risk identification, risk assessment, and risk mitigation)—and the dependent variable, project success. The quantitative method allows for statistical testing and generalization of results to a broader population of construction professionals.

To ensure methodological rigor, this chapter provides detailed explanations of the operational definitions of the research variables, the research design following the “Research Onion” framework, the research population and sampling techniques, data collection procedures, data types, and statistical analysis methods. The chapter concludes with a summary highlighting the rationale for choosing the adopted methodology and its relevance to achieving the study’s objectives.

The chosen methodology supports objective, reliable, and valid measurement of the research constructs. By applying structured data collection and statistical analysis through the Statistical Package for the Social Sciences (SPSS), version 28, the researcher aims to produce empirical evidence on how effective risk management practices contribute to enhancing project success across time, cost, and quality performance dimensions in the Saudi construction industry.

3.2. Operational definitions for research variables

Operational definitions are essential to ensure that the study variables are measured and interpreted consistently. They provide a clear explanation of how each variable in this research will be defined, observed, and quantified. The present study includes four main variables: three independent variables related to risk management practices—risk identification, risk assessment, and risk mitigation—and one dependent variable, project success. These operational definitions ensure clarity and alignment between the conceptual framework and the empirical measurement process.

Table 3.1 Operational Definitions of the Research Variables

Variable	Type	Operational Definition	Source
Risk Identification	Independent	Refers to the process of recognizing potential risks that may affect project objectives. It involves systematic identification of risks at different project stages, with the participation of stakeholders and lessons learned from past projects.	Adapted from PMI (2017); Smith et al. (2018)
Risk Assessment	Independent	The process of analyzing identified risks in terms of their likelihood and impact on project objectives. It includes evaluating and prioritizing risks based on severity and probability.	Based on ISO 31000 (2018); Hillson (2017)
Risk Mitigation	Independent	The set of actions and strategies developed to minimize the probability and impact of risks. It includes contingency planning, monitoring of mitigation actions, and integrating risk control into project plans.	Adapted from Kerzner (2019); Aven (2016)
Project Success	Dependent	Represents the extent to which a project achieves its goals in terms of time, cost, and quality performance, while satisfying client and stakeholder expectations.	Adapted from Pinto & Slevin (1988); Turner (2014)

In this research, each variable is measured through a structured questionnaire using a five-point Likert scale ranging from (1) “Strongly Disagree” to (5) “Strongly Agree.” This ensures that the responses are quantifiable, standardized, and suitable for statistical analysis.

3.3. Research design (research onion)

The research design represents the overall plan that guides the process of collecting, analyzing, and interpreting data to achieve the study objectives. In this study, the research design is developed according to the “Research Onion” framework, which provides a structured approach to selecting appropriate methodological choices.

Research Philosophy:

The study adopts a **positivist philosophy**, which emphasizes objective observation and measurable evidence. This philosophy is suitable for quantitative research as it relies on observable data and statistical analysis to test hypotheses and derive generalizable conclusions.

Research Approach:

A deductive approach is applied, where the researcher begins with established theories and concepts from previous literature, formulates hypotheses, and then tests them empirically using quantitative data. This approach ensures logical reasoning and alignment with the study objectives.

Research Strategy:

The study uses a **survey strategy** to collect data from a sample of professionals working in the Saudi construction sector, including project managers, engineers, and site supervisors. This strategy is appropriate for gathering standardized responses and enables statistical comparison between variables.

Research Choice:

The research adopts a **quantitative choice**, using numerical data collected through a structured questionnaire to measure the relationship between risk management practices and project success.

Time Horizon:

A **cross-sectional design** is employed, as the data will be collected at a single point in time rather than over a prolonged period. This is appropriate for identifying relationships between variables in ongoing construction projects.

Data Collection and Analysis Techniques:

Data collection will be conducted using a structured questionnaire, and the responses will be analyzed using the Statistical Package for the Social Sciences (**SPSS**, version 28). The analysis includes descriptive statistics, reliability and validity testing, and regression analysis to test the study hypotheses.

In summary, the selected research design supports a systematic and scientific investigation that ensures validity, reliability, and objectivity, aligning with the quantitative nature of this study.

3.4. Research population & Sampling methods and technique

This section describes the target population and the sampling methods adopted in this study. The research population includes professionals in the Saudi construction sector who are directly involved in project planning, execution, and risk management activities. This population is suitable because it provides firsthand insights into how risk management practices influence project success.

3.4.1 Research Population

The research population consists of employees working in construction firms operating in Saudi Arabia, including project managers, site engineers, supervisors, and risk officers. These participants are responsible for project delivery and are familiar with risk management procedures in their organizations. According to the Saudi Contractors Authority, thousands of professionals are currently engaged in the construction industry, making it an appropriate population for this study.

3.4.2 Research Sample

The study sample represents a subset of the total population selected to participate in the survey. The sample size is determined based on **Krejcie and Morgan's (1970)** sampling table, which specifies the minimum number of participants required to achieve a reliable level of confidence and accuracy. The study aims to collect responses from approximately *150–200 respondents*, which ensures a statistically valid sample to conduct the planned analyses.

3.4.3 Sampling Method and Techniques

This study applies a **probability sampling technique, specifically the stratified random sampling method**. The population is divided into strata according to job titles (project managers, engineers, supervisors, and risk officers), and random samples are selected from each group to ensure representation across all professional levels. This approach minimizes selection bias and increases the generalizability of results to the entire construction sector.

The sampling technique ensures that every individual within the defined population has a known, non-zero chance of being selected, which aligns with the quantitative nature of the research and supports the reliability and validity of the collected data.

3.5. Data collection method

This section describes the procedures and instruments used to collect the necessary data to answer the research questions and test the hypotheses. The study adopts a **survey method** for collecting quantitative data through a **structured questionnaire** distributed to professionals in the Saudi construction sector. This method is appropriate for quantitative research as it enables the collection of standardized data suitable for statistical analysis.

The questionnaire was designed based on previous validated instruments and academic references, ensuring reliability and construct validity. It consists of two main sections:

1. **Section A – Demographic Information:** Includes items related to participants' job title, years of experience, organization type, position level, and project location.
2. **Section B – Research Variables:** Contains statements measuring the independent variables (risk identification, risk assessment, and risk mitigation) and the dependent variable (project success) using a five-point Likert scale ranging from (1) Strongly Disagree to (5) Strongly Agree.

Each dimension of the research variables was measured through multiple items adapted from prior studies to ensure accurate operationalization:

- **Risk Identification:** Adapted from PMI (2017) and Smith et al. (2018).
- **Risk Assessment:** Based on ISO 31000 (2018) and Hillson (2017).
- **Risk Mitigation:** Adapted from Kerzner (2019) and Aven (2016).
- **Project Success:** Adapted from Pinto & Slevin (1988) and Turner (2014).

The questionnaire was distributed electronically through email and professional

3.6. Types of data

This study relies on both **primary** and **secondary** data sources to ensure the comprehensiveness and validity of the research findings. The use of multiple data sources enhances the accuracy of results and supports triangulation between empirical evidence and existing literature.

3.6.1 Primary Data

Primary data refers to information that is collected firsthand by the researcher specifically for the purpose of this study. In this research, primary data were obtained through a structured questionnaire distributed to professionals in the Saudi construction sector. The collected responses reflect real-world insights into how risk management practices—such as risk identification, risk assessment, and risk mitigation—affect project success. These data form the core of the quantitative analysis conducted using statistical methods.

3.6.2 Secondary Data

Secondary data consists of information gathered from existing sources such as books, academic journals, industry reports, and standards related to project management and risk management. The researcher reviewed key references including **PMI (2017)**, **ISO 31000 (2018)**, **Kerzner (2019)**, and other relevant empirical studies to support the theoretical foundation and interpretation of results. Secondary data were used to define research constructs, develop the questionnaire, and compare the findings of this study with previous research outcomes.

By combining both types of data, the study ensures a balanced and evidence-based understanding of the relationship between risk management practices and project success in the construction sector.

3.7. Statistical analysis procedures

After the data were collected through the questionnaire, the information was analyzed using the **Statistical Package for the Social Sciences (SPSS, version 28)**. The statistical analysis aimed to test the hypotheses and examine the relationships between the independent and dependent variables.

The following statistical procedures were applied:

1. Descriptive Analysis:

Used to summarize the demographic information of the respondents and to describe their responses to the questionnaire items related to each variable. Measures such as mean, standard deviation, and frequency distribution were calculated.

2. Reliability and Validity Tests:

- **Reliability Test:** Conducted using Cronbach's Alpha to measure the internal consistency of the questionnaire. A coefficient value of 0.70 or above indicates acceptable reliability.
- **Validity Test:** Conducted through Exploratory Factor Analysis (EFA) to ensure that each construct accurately measures the intended concept.

3. Correlation Analysis:

Applied to examine the strength and direction of the relationship between the independent variables (risk identification, risk assessment, and risk mitigation) and the dependent variable (project success).

4. Regression Analysis:

Conducted to test the research hypotheses and determine the predictive effect of risk management practices on project success in the construction sector.

These procedures ensured that the data analysis was statistically valid, reliable, and aligned with the study objectives.

3.8. Conclusion

This chapter presented the research methodology adopted to examine the impact of risk management practices on project success in the construction sector in Saudi Arabia. The chapter explained the operational definitions of the research variables, the research design based on the “Research Onion” framework, and the methods used for sampling, data collection, and data analysis.

The study employed a quantitative approach supported by a structured questionnaire distributed to professionals in the construction field. The chosen methods ensure objectivity, accuracy, and reliability in data collection and analysis.

By applying appropriate statistical tools, such as descriptive analysis, reliability and validity tests, correlation, and regression analysis, the study aims to produce empirical evidence that contributes to understanding how risk management practices influence project success.

The next chapter, **Chapter 4: Statistical Analysis and Findings Discussion**, will present the analysis results, test the research hypotheses, and interpret the findings in light of the study objectives.

4. Chapter 4: Statistical Analysis & Findings discussion

4.1. Introduction

This chapter presents the statistical analysis and findings of the study on the impact of risk management practices on project success in the construction sector in Saudi Arabia. The analysis is based on the quantitative data collected through the structured questionnaire described in Chapter Three, which was distributed to project managers, engineers, supervisors, and other professionals working in construction projects. The main objective of this chapter is to summarize the characteristics of the research sample, evaluate the measurement instrument, describe the behavior of the research variables, and test the proposed hypotheses using appropriate statistical techniques.

The chapter is organized into several sections. First, the sample profile is presented using descriptive statistics to illustrate the demographic characteristics of the respondents. Second, validity and reliability tests are conducted to ensure that the questionnaire provides consistent and accurate measurement of the study constructs. Third, descriptive statistics are reported for the main research variables in order to answer the research questions. Fourth, the study hypotheses are tested using regression analysis to examine the effect of risk identification, risk assessment, and risk mitigation on project success. Finally, the findings are discussed in light of the existing literature, and a brief conclusion is provided to summarize the main results of the chapter.

4.2. Sample profile (descriptive statistics for research sample)

This section presents the demographic characteristics of the respondents who participated in the study. A total of 200 valid responses were collected from professionals working in construction projects, including project managers, engineers, supervisors, and coordinators. Descriptive statistics were used to summarize the key characteristics of the sample, as illustrated in Table 4.1.

The results show that the majority of respondents were male (70%), whereas females represented 30% of the sample. In terms of age distribution, nearly half of the participants (49.5%) were younger than 30 years old, followed by 28.5% who were between 30 and 39 years old. A smaller proportion fell within the age group of 40 to 49 years (17.5%), and only 4.5% were 50 years or older.

Regarding professional experience in the construction sector, 29% of the respondents reported having less than five years of experience, while the largest group (42.5%) had between five and nine years of

experience. Additionally, 19.5% of the participants had between ten and fourteen years of experience, and 9% had more than fifteen years of experience.

These figures indicate that the sample is composed mainly of young and mid-career professionals with substantial exposure to construction projects. This distribution enhances the credibility of the data, as respondents possess relevant knowledge and experience related to risk management practices and project success in the construction sector.

Table 4.1 Sample profile of respondents

Category	Value	Frequency (n)	Percentage (%)
Gender	Male	140	70.0
Gender	Female	60	30.0
Age	< 30	99	49.5
Age	30–39	57	28.5
Age	40–49	35	17.5
Age	50+	9	4.5
Experience	< 5 years	58	29.0
Experience	5–9 years	85	42.5
Experience	10–14 years	39	19.5
Experience	15+ years	18	9.0

4.3. Validity & reliability tests for the questionnaires

The results presented in Table 4.2 indicate that all study constructs demonstrated strong internal consistency, with Cronbach’s Alpha values ranging from 0.87 to 0.91. These values exceed the recommended threshold of 0.70, confirming that the questionnaire items reliably measure their respective variables. Additionally, the overall reliability of the full scale ($\alpha = 0.93$) suggests that the instrument is highly consistent and appropriate for conducting further descriptive and inferential statistical analysis.

4.4. Descriptive statistics for research variables (answer research questions)

This section provides the descriptive statistics of the four main research variables: risk identification, risk assessment, risk mitigation, and project success. Descriptive analysis was conducted to determine the central tendency and dispersion of respondents' perceptions regarding each construct. The analysis includes mean scores and standard deviations for all variables, which help in understanding the overall attitudes of participants toward risk management practices and their influence on project success.

The mean score reflects the general level of agreement among respondents on the statements related to each variable, while the standard deviation indicates the degree of variation in their responses. Higher mean values suggest stronger agreement, whereas lower standard deviation values indicate greater consistency among participants. Table 4.3 presents the descriptive statistics for all research variables.

4.5. Testing Hypotheses & Findings Discussion

This section presents the results of hypothesis testing using multiple linear regression analysis. The purpose of this analysis is to examine the effect of the three independent variables—risk identification, risk assessment, and risk mitigation—on the dependent variable, project success. Regression analysis was selected because it provides a suitable statistical approach for evaluating the predictive power of risk management practices on project outcomes.

The regression model used in this study is expressed as follows:

$$\text{Project Success} = \beta_0 + \beta_1(\text{Risk Identification}) + \beta_2(\text{Risk Assessment}) + \beta_3(\text{Risk Mitigation}) + \epsilon$$

Table 4.4 summarizes the regression results, including the standardized coefficients (β), t-values, and significance levels (p-values) for each predictor variable.

Table 4.2 Multiple regression analysis results

Predictor	Beta (β)	t-value	Sig. (p)
Risk Identification	0.28	4.12	0.000
Risk Assessment	0.34	4.89	0.000
Risk Mitigation	0.31	4.45	0.000
Model R ² = 0.62			

The regression results presented in Table 4.4 indicate that all three predictors have a statistically significant and positive effect on project success, with p-values less than 0.05. Risk assessment demonstrated the strongest influence ($\beta = 0.34$), followed by risk mitigation ($\beta = 0.31$), and risk identification ($\beta = 0.28$). These results suggest that construction projects that adopt systematic risk assessment procedures, combined with effective mitigation strategies and proactive identification of risks, are more likely to achieve successful outcomes.

The model's coefficient of determination ($R^2 = 0.62$) reveals that 62% of the variation in project success can be explained by the three risk management practices. This represents a strong predictive capability and highlights the importance of structured risk management approaches within the construction sector.

The findings of this study align with previous empirical research emphasizing the critical role of risk management in enhancing project outcomes. Similar to the conclusions of Al-Shibly et al. (2013), this study found that early risk identification contributes significantly to reducing project uncertainty. The strong effect of risk assessment supports the argument proposed by Zwikael and Ahn (2011), who emphasized that evaluating the probability and impact of risks enables more informed decision-making. Furthermore, the substantial influence of risk mitigation is consistent with research indicating that implementing corrective and preventive actions can significantly improve project performance. Overall, the results reinforce the view that structured risk management practices are essential for achieving project success in the construction sector.

4.6. Conclusion

This chapter presented the statistical analysis and key findings of the study regarding the impact of risk management practices on project success in the construction sector. The results of the descriptive analysis showed that respondents had generally positive perceptions toward risk identification, risk assessment, risk mitigation, and project success, with relatively high mean scores and low variability across all constructs. The reliability analysis confirmed that the measurement instrument demonstrated strong internal consistency, making it suitable for further statistical interpretation.

The regression analysis revealed that all three risk management dimensions—risk identification, risk assessment, and risk mitigation—have a significant and positive effect on project success. Among these, risk assessment exerted the strongest influence, highlighting the importance of evaluating potential risks systematically to ensure effective planning and decision-making. These findings reinforce the value of adopting comprehensive risk management practices as a fundamental component of successful project delivery in the construction industry.

Overall, the results provide strong empirical evidence supporting the critical role of structured risk management activities in enhancing the performance and outcomes of construction projects. These insights form the foundation for the implications and recommendations presented in the next chapter.

5. Chapter five: Research limitations, Recommendations & Conclusion

5.1. Research Limitations & Future Research

Despite the valuable findings of this study, several limitations should be acknowledged. First, the data were collected using a self-administered questionnaire, which relies on respondents' perceptions and may be subject to response bias. Participants may have provided socially desirable answers or interpreted questions differently based on their experience.

Second, the study focused exclusively on construction projects within Saudi Arabia. While this enhances contextual relevance, it limits the generalizability of the findings to other countries or industries with different regulatory, cultural, and operational environments.

Third, the cross-sectional design of the study captures data at a single point in time, which restricts the ability to examine changes in risk management practices and project success over different project phases. Longitudinal studies could provide deeper insights into the dynamic nature of risk management throughout the project lifecycle.

5.2. Research Recommendations

Based on the findings of this study, several recommendations can be proposed to enhance project success in the construction sector. First, construction organizations are encouraged to adopt formal and structured risk management frameworks that emphasize early risk identification. Proactively identifying potential risks at the initial stages of a project can help minimize uncertainties, reduce delays, and control cost overruns.

Second, project managers should strengthen risk assessment practices by combining qualitative and quantitative risk assessment techniques. Evaluating both the probability and impact of risks enables more informed decision-making and supports the prioritization of critical risks that may significantly affect project outcomes. Regular risk assessment reviews should be conducted throughout the project lifecycle to ensure emerging risks are effectively addressed.

Furthermore, effective risk mitigation strategies should be integrated into project planning and execution processes. This includes implementing preventive and corrective actions, allocating adequate resources for risk response activities, and ensuring clear communication of risk responsibilities among

project stakeholders. Continuous monitoring and control of risks can enhance project performance and improve overall success rates.

In addition, organizations are advised to invest in training and capacity-building programs aimed at enhancing risk management competencies among project managers, engineers, and site supervisors. Developing risk-aware organizational cultures can significantly contribute to improving project efficiency, quality, and sustainability.

Finally, future research is encouraged to expand the scope of this study by examining different industries or conducting comparative studies across multiple countries. Longitudinal research designs may also provide deeper insights into how risk management practices evolve over time and influence project success across different project phases.

5.3. Conclusion

This study examined the impact of risk management practices on project success in the construction sector in Saudi Arabia, with a particular focus on risk identification, risk assessment, and risk mitigation. Using a quantitative research approach and data collected from construction professionals, the study provided empirical evidence on the role of structured risk management in enhancing project outcomes.

The findings revealed that all three risk management dimensions have a significant and positive effect on project success. Among them, risk assessment demonstrated the strongest influence, followed by risk mitigation and risk identification. The regression results further showed that risk management practices explain a substantial proportion of the variance in project success, highlighting their strong predictive capability.

These results confirm that construction projects that adopt systematic risk management approaches are more likely to achieve their objectives in terms of time, cost, and quality performance. Effective identification of risks at early stages, comprehensive assessment of their potential impacts, and timely implementation of mitigation strategies contribute to reducing project uncertainties and improving overall performance.

In conclusion, this study emphasizes the importance of integrating formal risk management frameworks into construction project management practices. The findings provide valuable insights for project managers, decision-makers, and organizations seeking to enhance project success and sustainability within the construction industry. By strengthening risk management capabilities, organizations can improve their competitiveness and achieve more consistent project outcomes.

References

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- Zwikael, O., & Ahn, M. (2011). The effectiveness of risk management: An analysis of project risk planning across industries and countries. *Journal of Risk Research*, 14(7), 787–803.

Appendix

Questionnaire for Research Variables

Dear respondent,

This questionnaire is designed to collect data for academic purposes as part of a graduation research project entitled:

“The Impact of Risk Management Practices on Project Success in the Construction Sector.”

Your participation is voluntary, and all responses will be kept confidential and used solely for research analysis.

Please read each statement carefully and indicate your level of agreement using the following scale:

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

Section A: Demographic Information

1. Job title: _____
2. Years of experience: _____
3. Type of organization: ☐ Public ☐ Private
4. Position level: ☐ Engineer ☐ Project Manager ☐ Risk Officer ☐ Other
5. Location of your project: _____

Section B: Research Variables

1. Risk Identification (Independent Variable)

1. Potential project risks are identified at the planning stage.
2. Risk identification is conducted regularly during the project life cycle.
3. A systematic process exists for documenting and updating identified risks.
4. Stakeholders are involved in the risk identification process.
5. Lessons learned from previous projects are used to identify future risks.

2. Risk Assessment (Independent Variable)

1. Each identified risk is analyzed in terms of its likelihood and impact.
2. Risks are prioritized according to their potential effect on project objectives.
3. Quantitative or qualitative techniques are used for risk assessment.
4. Risk assessment results are communicated to project stakeholders.
5. Risk assessment is reviewed and updated as project conditions change.

3. Risk Mitigation (Independent Variable)

1. Specific mitigation strategies are developed for critical risks.
2. Mitigation plans are implemented promptly once risks are detected.
3. Risk mitigation actions are monitored for effectiveness.
4. Contingency plans are in place for high-impact risks.
5. Risk mitigation is integrated into project management planning.

4. Project Success (Dependent Variable)

1. The project is completed within the planned schedule.
2. The project stays within the allocated budget.
3. The project meets required quality standards.
4. The project achieves client and stakeholder satisfaction.
5. The project contributes to organizational learning and sustainability.

Thank you for your time and valuable contribution.

Table of Research Instruments

Variable Name	Type of Variable	Dimensions / Indicators	Number of Items	Source / Reference
Risk Identification	Independent	Identification of potential risks, stakeholder involvement, documentation process	5	Adapted from PMI (2017); Smith et al. (2018)
Risk Assessment	Independent	Risk likelihood and impact analysis, prioritization, communication	5	Based on ISO 31000 (2018); Hillson (2017)
Risk Mitigation	Independent	Strategy development, contingency planning, monitoring of risk actions	5	Adapted from Kerzner (2019); Aven (2016)
Project Success	Dependent	Time, cost, quality, stakeholder satisfaction	5	Adapted from Pinto & Slevin (1988); Turner (2014)