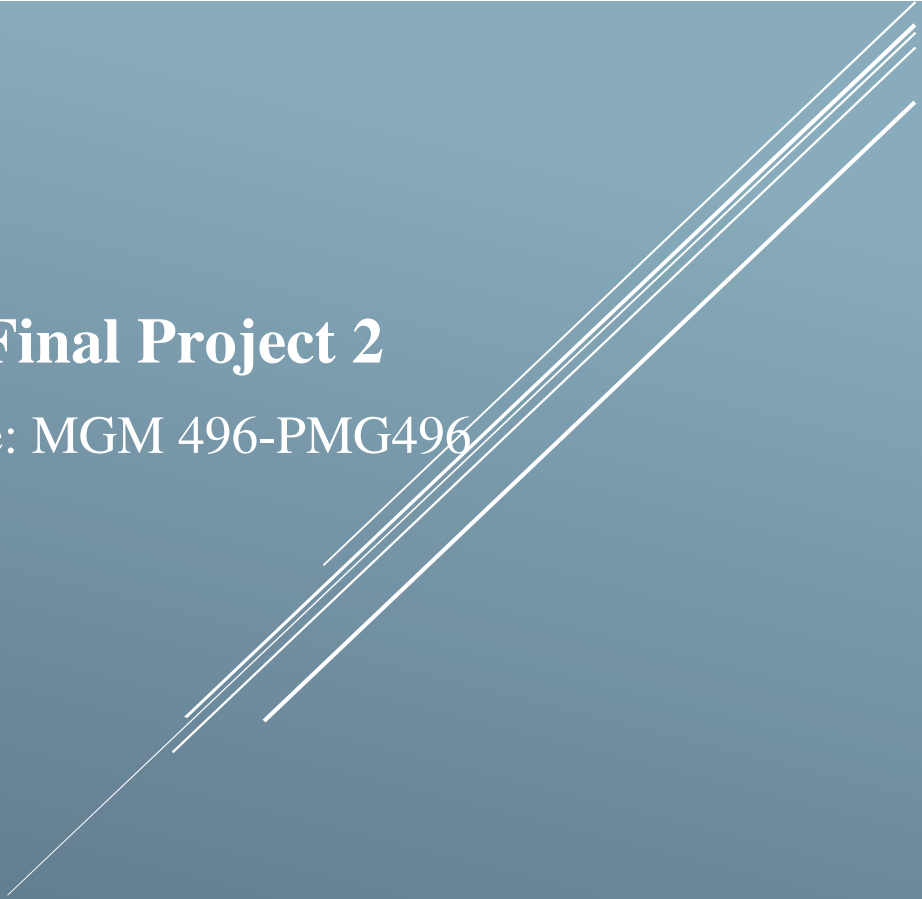




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**Impact of Risk Management on Project Performance in Saudi
Construction: Case of Nesma & Partners Co.**

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**Impact of Risk Management on Project Performance in Saudi
Construction: Case of Nesma & Partners Co.**

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Chapter 3: Research Methodology

Impact of Risk Management on Project Performance in Saudi Construction: Case of Nesma & Partners Co.

3.1 Introduction to Nesma & Partners Co.

Nesma & Partners Co. is a leading Saudi Arabian engineering, procurement, and construction (EPC) company and a core subsidiary of Nesma Holding, a privately owned Saudi conglomerate established in 1979 by its founder, His Excellency Saleh Al-Turki. Headquartered in Al Khobar, with corporate offices in Jeddah and Riyadh, Nesma & Partners has operated in the Kingdom's construction sector for more than four decades, delivering civil, building, industrial, mechanical, and electro-mechanical construction services.

The company forms part of a diversified holding group whose business portfolio spans construction, power and electrical, oil and gas, real estate and property management, hospitality, information and communication technology, and support services, with an expanding footprint in the UAE and Egypt. Nesma & Partners employs a large workforce executing large-scale infrastructure, industrial, and building projects that directly support Saudi Arabia's Vision 2030 economic diversification agenda.

Given the scale, complexity, and multi-stakeholder nature of its project portfolio, Nesma & Partners provides a relevant and information-rich organizational setting for examining how structured risk management practices influence project performance outcomes such as cost control, schedule reliability, and quality delivery.

3.2 Operational Definitions of Research Variables

To ensure the constructs in this study are measurable and testable, each variable is operationally defined below in terms of how it will be observed, measured, and analyzed using the survey instrument.

3.2.1 Independent Variable: Risk Management Practices

Risk Management Practices refer to the set of structured organizational activities used to identify, evaluate, and respond to project uncertainties. In this study, the variable is operationalized through three sub-dimensions, each measured using multi-item, five-point Likert-scale questions (1 = Strongly Disagree to 5 = Strongly Agree) adapted from established project risk management literature.

Risk Identification

Operationally defined as the extent to which project teams systematically detect and document potential risk events before they materialize, measured through items addressing the use of risk registers, checklists, brainstorming sessions, and historical project data.

Risk Assessment

Operationally defined as the degree to which identified risks are analyzed for probability and impact using structured tools (e.g., probability-impact matrices, qualitative/quantitative risk analysis), measured through items on risk prioritization and evaluation frequency.

Risk Mitigation

Operationally defined as the extent to which formal response strategies (avoidance, transfer, reduction, acceptance) and contingency plans are developed and implemented, measured through items on mitigation planning, resource allocation, and monitoring of response effectiveness.

3.2.2 Dependent Variable: Project Performance

Project Performance refers to the degree to which a project achieves its intended outcomes relative to the triple constraint. It is operationalized through three measurable sub-dimensions:

Cost Performance

Operationally defined as the variance between planned/budgeted cost and actual project cost, measured perceptually through respondent ratings of cost overrun frequency and budget adherence.

Time / Schedule Performance

Operationally defined as the extent to which project milestones and final delivery dates are met relative to the baseline schedule, measured through items on delay frequency and schedule adherence.

Quality Performance

Operationally defined as the degree to which project deliverables conform to specified technical, safety, and client requirements, measured through items on rework frequency, defect rates, and client acceptance.

Variable	Type	Dimensions	Measurement Scale
Risk Management Practices	Independent (IV)	Identification, Assessment, Mitigation	5-point Likert scale
Project Performance	Dependent (DV)	Cost, Time/Schedule, Quality	5-point Likert scale

Table 3: Operationalization of Research Variables

3.3 Research Design (The Research Onion)

This study's methodology is structured using Saunders, Lewis, and Thornhill's (2019) Research Onion framework, which peels through six successive layers to justify each methodological choice from the broadest philosophical stance down to specific data collection techniques.

3.3.1 Research Philosophy: Positivism

The study adopts a positivist philosophy, treating risk management and project performance as observable, measurable phenomena. This supports the use of structured, quantifiable data and statistical hypothesis testing rather than subjective interpretation.

3.3.2 Research Approach: Deductive

A deductive approach is applied, whereby hypotheses (H1–H4) are derived from existing risk management and project performance theory and then tested empirically against data collected from Nesma & Partners Co.

3.3.3 Research Strategy: Survey / Case Study

A survey strategy is employed within a single organizational case study (Nesma & Partners Co.), allowing standardized data to be collected from a defined population using a structured questionnaire while retaining contextual relevance to the Saudi construction sector.

3.3.4 Methodological Choice: Mono-Method Quantitative

The study follows a mono-method quantitative choice, relying on numerical survey data analyzed through statistical procedures to test the proposed hypotheses and relationships between variables.

3.3.5 Time Horizon: Cross-Sectional

Data is collected at a single point in time (cross-sectional), providing a snapshot of current risk management practices and performance perceptions rather than tracking change over an extended period.

3.3.6 Techniques and Procedures

The innermost layer involves the specific data collection and analysis techniques: a structured, self-administered questionnaire distributed to employees at Nesma & Partners Co., with data analyzed using SPSS through descriptive, reliability, correlation, and regression procedures (detailed in Sections 3.5 and 3.7).

3.4 Research Population and Sampling

3.4.1 Target Population

The target population consists of employees directly involved in project execution at Nesma & Partners Co., including project managers, site/civil

engineers, quantity surveyors, project supervisors, and department heads across the company's active construction and infrastructure projects in Saudi Arabia. This population was selected because these roles have direct, first-hand exposure to risk management processes and project performance outcomes.

3.4.2 Sampling Technique

A non-probability purposive (judgmental) sampling technique is used. Purposive sampling is appropriate because respondents must possess direct, practical experience with risk identification, assessment, and mitigation on active construction projects; random selection would risk including staff without sufficient exposure to the phenomena under study.

3.4.3 Sample Size

Using Krejcie and Morgan's (1970) sample size determination guidance and Yamane's formula as a cross-check, a sample of approximately 150–200 respondents is targeted from an estimated eligible population of 400–600 project-facing employees, which is sufficient to support correlation and multiple regression analysis with adequate statistical power.

- Inclusion criteria: minimum one year of experience on Nesma & Partners construction projects, direct involvement in project planning/execution.
- Exclusion criteria: administrative or non-project-based staff with no direct project involvement.
- Distribution method: questionnaires administered on-site and electronically (Google Forms/email) to accommodate multiple project locations.

3.5 Data Collection Method

3.5.1 Primary Data

Primary data is collected through a structured, self-administered questionnaire developed from validated scales in the project risk management literature. The questionnaire consists of four sections: (1) respondent demographics, (2) risk management practices (identification, assessment, mitigation), (3) project performance (cost, time, quality), and (4) open-ended comments on governance challenges.

3.5.2 Secondary Data

Secondary data is gathered from academic journals, the Project Management Institute's PMBOK Guide, industry and government reports (e.g., Vision 2030 documentation), and publicly available Nesma & Partners company information, used to build the literature review and contextualize findings.

3.5.3 Instrument Validity and Reliability

Content validity is established through expert academic review of the questionnaire prior to distribution. A pilot test of 20–30 respondents is conducted to assess clarity and internal consistency, with Cronbach's Alpha calculated for each construct (acceptable threshold ≥ 0.70) before full-scale distribution.

3.6 Types of Data

Classification	Type Used in This Study	Justification
Nature of data	Quantitative	Likert-scale responses enable numerical statistical analysis
Source	Primary and Secondary	Questionnaire (primary) supplemented by literature/reports (secondary)
Time dimension	Cross-sectional	Data collected at a single point in time
Measurement level	Ordinal (Likert) and Nominal (demographics)	Supports non-parametric and parametric statistical tests

Table 4: Classification of Data Types Used in the Study

3.7 Statistical Analysis Procedures

Collected data is coded and analyzed using SPSS (Statistical Package for the Social Sciences). The following procedures are applied sequentially:

Data screening and cleaning: checking for missing values, outliers, and normality (Shapiro-Wilk / skewness-kurtosis tests).

1. Reliability analysis: Cronbach's Alpha to confirm internal consistency of each construct (Risk Identification, Risk Assessment, Risk Mitigation, Cost, Time, Quality Performance).

2. Descriptive statistics: means, standard deviations, and frequency distributions to profile respondents and summarize variable levels.
3. Correlation analysis: Pearson's correlation coefficient to examine the strength and direction of relationships between risk management dimensions and project performance dimensions.
4. Multiple regression analysis: to test hypotheses H1–H3 by estimating the predictive effect of Risk Identification, Risk Assessment, and Risk Mitigation on overall Project Performance, controlling for demographic variables.
5. Hypothesis testing: significance assessed at the 0.05 level ($p < 0.05$), with regression coefficients (β), R^2 , and adjusted R^2 reported to indicate explanatory power.

Together, these procedures allow the study to move from descriptive profiling of risk governance practices to statistically testing the extent to which risk management predicts project performance outcomes at Nesma & Partners Co.