

## Strategic Planning as a Mediating Mechanism Between Project Management Knowledge Areas and Construction Project Quality

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### **Abstract:**

*This study aims to analyse the role of strategic planning, as a mediating mechanism in the relationship between project quality. The study proceeds from the assumption that the application of project management knowledge areas does not directly translate into project quality without the support of strategic planning to ensure alignment of projects with the organization's long-term objectives. A descriptive-analytical approach was adopted, encompassing all members of the study population within the construction sector of the Yemen Economic Corporation (73 individuals). Data were collected using a validated questionnaire and analysed via SPSS (version 28) and Smart PLS (version 4) to assess reliability, validity, and the mediation model. The findings revealed that the construction sector applies project management knowledge areas to a relatively high degree, with variation across dimensions. Project quality was found to be high in dimensions related to efficiency, effectiveness, and impact, yet lower in sustainability. Mediation analysis confirmed that strategic planning plays a substantial mediating role, enhancing the effect of knowledge areas on construction project quality. The study recommends strengthening awareness and training in project management and strategic planning, employing modern technologies in project management, and adopting precise performance and quality indicators to ensure the delivery of high-quality, cost-effective, and sustainable projects. Such measures contribute to improved organizational performance and enhanced competitiveness.*

**Keywords:** Strategic planning, construction project quality, construction sector, Knowledge areas, Yemen Economic Corporation.

## 1. Introduction

Construction projects are among the primary drivers of economic and social development, given their role in infrastructure development, productivity enhancement, and job creation, particularly in developing countries and fragile environments. However, the complexity of modern projects, the multiplicity of stakeholders, and the high levels of risk and uncertainty render their management a strategic challenge that necessitates the adoption of systematic management frameworks grounded in international best practices (PMI, 2021; Kerzner, 2022).

Project management has evolved as an organized body of knowledge aimed at balancing the determinants of time, cost, quality, and scope, with an emphasis on creating sustainable value for organizations and stakeholders (Too & Weaver, 2014; PMI, 2021). The PMBOK guide serves as a global reference that defines integrated knowledge areas including integration, scope, schedule, cost, quality, resources, risk, procurement, and stakeholder management as fundamental elements for enhancing project success (PMI, 2021). Contemporary literature suggests that the effective application of these knowledge areas is positively associated with project performance and strategic outcomes (Joslin & Müller, 2015; Matens & Carvalho, 2017).

Concurrently, project quality is conceptualized as a multidimensional construct that extends beyond compliance with technical specifications to encompass effectiveness, efficiency, impact, sustainability, and the extent to which projects meet beneficiary needs (OECD, 2019). Strategic planning is also considered a critical factor in aligning projects with an organization's long-term objectives and enhancing its competitiveness, particularly in volatile environments (Bryson, 2018; George et al, 2019).

Despite the growing body of research addressing project management and its impact on performance, there remains a need to investigate the integrative role of project management knowledge areas in improving project quality through strategic planning, especially in contexts characterized by institutional and economic instability. From this perspective, the present study aims to analyse the relationship between project management knowledge areas and construction project quality, while testing the mediating role of strategic areas and construction project quality, while testing the mediating role of strategic planning in the construction sector of the Yemen Economic Corporation. This endeavour seeks to address a significant research gap in the applied literature within fragile environments.

### 1.1. Problem statement

Construction projects in developing environments face increasing challenges related to operational complexity, multiplicity of

stakeholders, resource constraints, and high levels of uncertainty, all of which impact project quality, efficiency, and sustainability.

Contemporary literature in project management indicates that adherence to project management knowledge areas represents a fundamental approach to improving performance and controlling the determinants of time, cost, and quality. Nevertheless, practical outcomes in numerous contexts reveal persistent gaps in project quality despite the adoption of these knowledge areas, raising questions regarding the organizational factors that may enhance or diminish their impact.

Within this context, strategic planning emerges as a managerial mechanism capable of aligning projects with an organization's long-term directions, fostering integration between resources and objectives, and improving decision-making processes in dynamic environments. However, studies examining strategic planning as a mediating variable that explains the relationship between project management knowledge areas and construction project quality remain limited, particularly in institutional settings characterized by instability and operational challenges.

Accordingly, the research problem is defined by the need to develop an analytical model that elucidates how project management knowledge areas contribute to improving construction project quality through strategic planning as a mediating mechanism, thereby addressing a theoretical and applied gap in the project management literature.

In light of the foregoing, this study seeks to answer the following main question:

-To what extent does strategic planning, as a mediating mechanism, contribute to explaining the relationship between project management knowledge areas and construction project quality?

The following sub-questions derive from this main question:

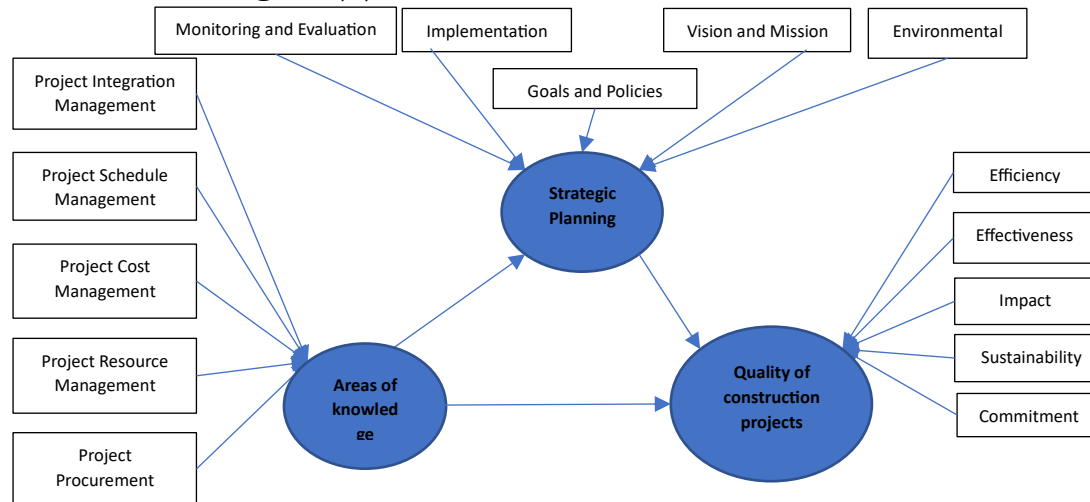
- 1- What is the level of application of project management knowledge areas in the construction sector under study?
- 2- What is the level of construction project quality according to the adopted project quality evaluation dimensions?
- 3- What is the nature of the direct relationship between project management knowledge areas and construction project quality?
- 4- What is the level of strategic planning practice in the construction sector?
- 5- Does strategic planning play a statistically significant mediating role in the relationship between project management knowledge areas and construction project quality?

These research questions contribute to constructing an integrated analytical framework that aids in elucidating the mechanisms for

improving project quality in the construction sector within a specific institutional and developmental context.

### 1.2. Conceptual Framework of the Study

The following conceptual framework was developed and tested, as illustrated in Figure (1).



**Figure 1** Cognitive model of the study.

Source: Prepared by the researcher.

### 1.3. Literature Review and Hypothesis Development:

#### - Studies Addressing Knowledge Areas

Project management knowledge areas (PMBOK) are widely recognized as core components in enhancing organizational performance and improving project quality. Numerous studies have emphasized the importance of adhering to these knowledge areas in achieving effective and sustainable outcomes. For example, Shomali and Nassar (2020) found that the application of project management knowledge areas had a strong positive impact on the quality of public projects in Palestine. Similar findings were reported by Hawamdeh and Al-Malkawi (2022), Eissa, Mia, and Nasser (2023), Anayochukwu and Wilson (2025), and Touqan (2020), all of whom confirmed the significant role of project management knowledge areas in enhancing project performance and quality across different contexts.

Despite the consistency of findings regarding the importance of knowledge areas, many of these studies were confined to direct relationships without exploring the roles of mediating variables that might elucidate the mechanisms of influence.

#### **Studies Examining the Relationship Between Knowledge Areas and Construction Project Quality**

A number of scholars have examined the relationship between the application of project management knowledge areas and construction

project quality, emphasizing that these knowledge areas contribute significantly to improving various project outcomes. In this regard, Al-Yajori (2021) found that the implementation of project management knowledge areas contributes to enhancing and increasing project quality. Similar conclusion was reported by Al-Wazir (2021) as well as Al-Zahrani and Al-Madani (2025) who demonstrated that applying project management knowledge areas significantly improved the quality of projects implemented by the Ministry of Health in Makkah. Furthermore, Al-Amoudi, Hassan, and Jarad (2024) concluded that the role of project management knowledge areas has a statistically significant and positive effect on improving the quality of services delivered. Likewise, Eissa, Mia, and Nasser (2023) identified a strong, positive, and statistically significant relationship between project management knowledge areas and quality indicators.

Collectively, these studies confirm that project management knowledge areas, when managed in accordance with the PMBOK framework, are closely associated with qualitative project outcomes, including compliance with technical specifications, enhanced beneficiary satisfaction, and the reduction of time and cost overruns.

- ***Studies Addressing the Mediating Role of Strategic Planning***

A growing body of research has highlighted that strategic planning does not merely exert a direct effect; rather, it functions as a mediating variable that strengthens the relationship between knowledge domains and institutional performance outcomes. For example, Al-Sharifi and Al-Murshidi (2025) identified a positive relationship between strategic planning and improved project management practices. Similarly, Ali and Raouf (2022) concluded that strategic planning has a significant impact on project performance. Mirza and Najm (2021) found a statistically significant correlation between strategic planning and quality performance assurance. Moreover, Karim and Saeed (2020) reported both a significant relationship and a measurable effect between strategic planning and the performance of construction projects.

These findings collectively underscore the pivotal role of strategic planning in enhancing project outcomes and reinforcing the effectiveness of managerial and knowledge-based practices within organizations.

Despite these contributions, there remains a notable paucity in the applied literature concerning the examination of the actual mediating role of strategic planning between knowledge areas and construction project quality, particularly in unstable or fragile environments such as the construction sector in Yemen. Accordingly, the present study

derives its significance from addressing this theoretical and applied gap.

### **Hypothesis Development**

Based on the foregoing, this study posits both direct and indirect effects of knowledge areas on construction project quality, with strategic planning considered as a mediating variable. The main hypothesis and its subsidiary hypotheses were formulated as follows:

#### **Main Hypothesis**

H: Strategic planning mediates the relationship between knowledge areas and construction project quality.

#### **Subsidiary Hypotheses**

H1: There is a statistically significant effect of knowledge areas on construction project quality.

H2: There is a statistically significant effect of knowledge areas on strategic planning.

H3: There is a statistically significant effect of strategic planning on construction project quality.

H4: There is a statistically significant effect of knowledge areas on construction project quality through strategic planning.

## **2. Methodology**

This study adopted a quantitative descriptive approach.

The study population consisted of all employees working at the headquarters of the construction sector affiliated with the Yemen Economic Corporation at the time of conducting this study, totalling 73 employees according to the personnel affairs records of the construction sector. Due to the small size of the study population, a comprehensive census method was employed, and the sample included all 73 members of the original population.

All distributed questionnaires were retrieved, yielding a response rate of 100%.

A paper-based questionnaires was developed as the primary data collection instrument. The construction of the questionnaire required precise scientific and methodological formulation of items and questions to ensure their appropriateness for the target population and their direct relevance to the study objectives.

In developing the questionnaire items, the researcher drew upon several previous studies related to the study variables-namely, knowledge areas, construction project quality, and strategic planning-most notably studies by Al-Zahrani and Al-Madani (2025), Al-Amoudi, Hassan, and Jarad (2024), Eissa, Mia, and Nasser (2023), Ghaleb and Al-Bakri (2022), Hawamdeh and Al-Malkawi (2022), Touqan (2020), Mizyed (2018), Al-Sharifi and Al-Murshidi (2025), Al-Yajouri (2021), Ali

and Raouf (2022), Mirza and Najm (2021), Abdel Nabi (2021), Al-Nuaimi and Al-Ashrafi (2020), and Zuwein and Taher (2020).

Following the preparation of the preliminary questionnaire, it was submitted to a panel of academic experts specializing in management and statistics to solicit their opinions regarding the appropriateness of its items and their relevance to the study dimensions and variables. Based on the reviewers' feedback, the researchers made the necessary modifications to arrive at the final version of the instrument.

The questionnaire was presented to ten reviewers to ensure that each item accurately measured the dimension for which it was designed. The reliability of the study instrument was assessed using Cronbach's alpha coefficient, with reliability values for all variables ranging between 0.70 and 0.95, indicating a high degree of reliability and internal consistency (Sekaran & Bougie, 2016).

### 3. Results and Discussion

#### 3.1. Descriptive Analysis of Knowledge Areas

The descriptive analysis of knowledge areas in construction projects Table 1 revealed that knowledge areas overall received a relatively high evaluation, with an overall mean of 4.611 and a relative importance of 65.9%. project integration management ranked highest with a mean of 4.906 and a relative importance of 70.1%, followed by project resource management (mean=4.564, relative importance =68.1%), project cost management (mean=4.564, relative importance=65.2%), and project schedule management (mean=4.515, relative importance=64.5%). In contrast, project procurement management recorded the lowest evaluation, with a mean of 4.304 and a relative importance of 61.5%, corresponding to a "moderate" verbal rating.

These findings indicate that participants assign greater priority to areas related to resource integration, cost control, and adherence to schedules, whereas procurement management is perceived as relatively less influential. This underscores the importance of strengthening core knowledge areas to ensure project quality.

**Table 1** Descriptive Analysis of Project Management Knowledge Areas

| Knowledge Area                 | Mean  | Standard Deviation | Relative Importance (%) | Verbal Rating   |
|--------------------------------|-------|--------------------|-------------------------|-----------------|
| Project Integration Management | 4.906 | 1.708              | 70.1%                   | Relatively High |
| Project Schedule Management    | 4.515 | 1.813              | 64.5%                   | Relatively High |

|                    |             |       |       |       |                 |
|--------------------|-------------|-------|-------|-------|-----------------|
| Project Management | Cost        | 4.564 | 1.413 | 65.2% | Relatively High |
| Project Management | Resource    | 4.766 | 1.621 | 68.1% | Relatively High |
| Project Management | Procurement | 4.304 | 1.831 | 61.5% | Moderate        |
| Overall, Areas     | Knowledge   | 4.611 | 1.585 | 65.9% | Relatively High |

### 3.2. Descriptive Analysis of Construction Project Quality

The descriptive analysis of construction project quality Table 2 indicates that overall construction project quality received a relatively high evaluation, with an overall mean of 4.817 and a relative importance of 68.8%.

The impact dimension ranked highest among all dimensions, with a mean of 5.425 and a relative importance of 77.5%, reflecting participants' awareness of the strong effect of project quality on final outcomes. This was followed by relevance (mean=5.033, relative importance=71.9%), effectiveness (mean=4.751, relative importance=67.9%), and efficiency (mean=4.612, relative importance=65.9%). In contrast, the sustainability dimension recorded the lowest evaluation, with a mean of 4.263 and a relative importance of 60.9%, corresponding to a "moderate" verbal rating.

These findings suggest that participants assign greater importance to quality dimensions that directly influence project outcomes-such as impact, relevance, and effectiveness-whereas sustainability is perceived as relatively less influential in the context of current construction projects. This highlights the need to enhance attention to sustainability within project quality improvement strategies.

**Table 2** Descriptive Analysis of Construction Project Quality

| Dimension                            | Mean  | Standard Deviation | Relative Importance (%) | Verbal Rating   |
|--------------------------------------|-------|--------------------|-------------------------|-----------------|
| Relevance                            | 5.033 | 1.145              | 71.9%                   | Relatively High |
| Efficiency                           | 4.612 | 1.569              | 65.9%                   | Relatively High |
| Effectiveness                        | 4.751 | 1.419              | 67.9%                   | Relatively High |
| Impact                               | 5.425 | 1.155              | 77.5%                   | High            |
| Sustainability                       | 4.263 | 1.371              | 60.9%                   | Moderate        |
| Overall Construction Project Quality | 4.817 | 1.187              | 68.8%                   | Relatively High |

### 3.3. Descriptive Analysis of Strategic Planning

The descriptive analysis of strategic planning Table 3 indicates that the overall level of strategic planning was moderate, with an overall mean of 3.683 and a relative importance of 52.6%.

Regarding the dimensions of strategic planning, the results showed that the “mission and vision” and “execution” dimensions received the highest ratings among all dimensions, with means of 3.722 and 3.723, respectively, and a relative importance of 53.2%, corresponding to a “moderate” verbal rating. This reflects participants’ awareness of the importance of defining vision and mission to ensure the implementation of strategic plans.

Environmental variables analysis achieved a mean of 3.715 and a relative importance of 53.1%, while monitoring and evaluation recorded a mean of 3.699 and a relative importance of 52.8%. In contrast, the goals and policies dimension recorded the lowest mean of 3.558 and a relative importance of 50.8%, corresponding to a “low” verbal rating. This indicates that participants perceive a greater need to enhance the clarity of strategic goals and policies to achieve higher effectiveness in strategic planning.

Overall, these findings reflect that strategic planning is implemented to a moderate degree, with a notable need to enhance the clarity of strategic goals and policies to maximize its impact on project quality.

**Table 3** Descriptive Analysis of Strategic Planning

| <b>Dimension</b>                 | <b>Mean</b> | <b>Standard Deviation</b> | <b>Relative Importance (%)</b> | <b>Verbal Rating</b> |
|----------------------------------|-------------|---------------------------|--------------------------------|----------------------|
| Environmental Variables Analysis | 3.715       | 1.586                     | 53.1%                          | Moderate             |
| Mission and Vision               | 3.722       | 1.619                     | 53.2%                          | Moderate             |
| Goals and Policies               | 3.558       | 1.684                     | 50.8%                          | Low                  |
| Execution                        | 3.723       | 1.539                     | 53.2%                          | Moderate             |
| Monitoring and Evaluation        | 3.699       | 1.671                     | 52.8%                          | Moderate             |

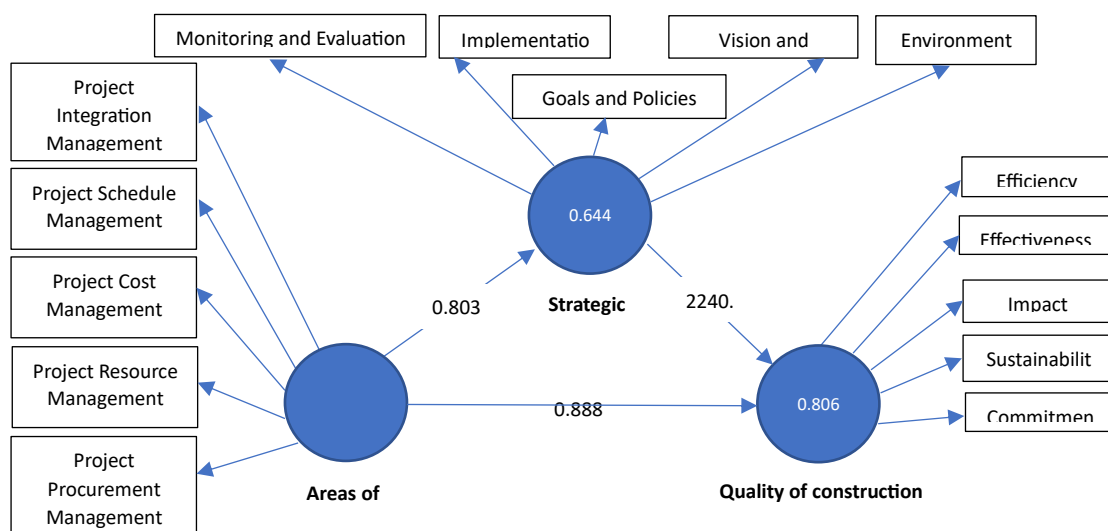
|                            |       |       |       |          |
|----------------------------|-------|-------|-------|----------|
| Overall Strategic Planning | 3.683 | 1.517 | 52.6% | Moderate |
|----------------------------|-------|-------|-------|----------|

### 3.4. Hypothesis Testing

The Partial Least Squares (PLS) technique was employed to evaluate the proposed model and test the study hypotheses using Smart PLS software (Version 4). Path analysis was conducted to examine the relationships between the study variables. Table 4 and figure 2 presents the results of the hypothesis testing.

**Table 4** Testing the Effect of Knowledge Areas on Construction Project Quality Using Partial Least Squares

| Hypothesis Path                                                     | R <sup>2</sup> | Beta  | Standard Error | t-value | Significance | Decision  |
|---------------------------------------------------------------------|----------------|-------|----------------|---------|--------------|-----------|
| Knowledge Areas → Construction Project Quality                      |                | 0.888 | 0.023          | 39.040  | 0.000*       | Supported |
| Knowledge Areas → Strategic Planning                                |                | 0.803 | 0.043          | 18.724  | 0.000*       | Supported |
| Strategic Planning → Construction Project Quality                   |                | 0.224 | 0.103          | 2.182   | 0.015*       | Supported |
| Knowledge Areas → Strategic Planning → Construction Project Quality | 0.806          | 0.180 | 0.082          | 2.179   | 0.015*       | Supported |
| *Statistically significant at the level ( $\alpha \leq 0.05$ )      |                |       |                |         |              |           |



**Figure 2** Path of the sub-hypotheses.

### **3.5 Interpretation of Hypothesis Testing Results.**

Table 4 presents the results of the analysis examining the effect of knowledge areas on construction project quality using Partial least Squares Structural Equation Modeling (PLS-SEM), with strategic planning incorporated as a mediating variable.

1. Effect of Knowledge Areas on Construction Project Quality. The results revealed that knowledge areas exert a direct and strong effect on construction project quality, with a beta coefficient ( $\beta$ ) of 0.888, a T-value of 39.04, and statistical significance at  $p < 0.001$  ( $\alpha \leq 0.05$ ). This indicates that improved performance and management of knowledge areas-such as integration management, schedule management, resource management, cost management, and procurement management-are substantially associated with enhanced construction project quality. Accordingly, subsidiary hypothesis H1 is statistically supported.
2. Effect of Knowledge Areas on Strategic Planning. The analysis demonstrated that knowledge areas have a positive and significant effect on strategic planning, with a beta coefficient ( $\beta$ ) of 0.803, at T-value of 18.724, and  $p < 0.001$ . This suggests that enhancing project-related knowledge and practical expertise contributes to strengthening the organization's capacity for effective strategic planning. Subsidiary hypothesis H2 is statistically supported.
3. Effect of Strategic Planning on Construction Project Quality. The findings indicated that strategic planning exerts a positive and moderate effect on project quality, with a beta coefficient ( $\beta$ ) of 0.224, a T-value of 2.182, and  $p < 0.05$ . This demonstrates that robust strategic planning contributes to improving project quality through enhanced organization, resource allocation, and progress monitoring. Subsidiary hypothesis H3 is statistically supported.
4. The Mediating Role of Strategic Planning in the Relationship Between Knowledge Areas and Construction Project Quality. The analysis confirmed the existence of an indirect effect of knowledge areas on construction project quality via strategic planning, with a beta coefficient ( $\beta$ ) of 0.180, a mediating variable that enhances the effect of knowledge on quality. Consequently, subsidiary hypothesis H4, concerning mediation, is statistically supported.

## **4. Conclusions and Recommendations**

### **4.1. Conclusions**

Based on the results of the descriptive analysis and hypothesis testing, several key conclusions can be drawn regarding the impact of

knowledge areas and strategic planning on improving construction project quality:

1. **The Importance of Knowledge Areas in Project Management:** The results demonstrated that project management knowledge areas—such as integration management, schedule management, resource management, cost management, and procurement management—exhibit relatively high levels of importance, with relative importance percentages ranging between 61.5% and 70.1%. This indicates that knowledge-based practices associated with project management constitute a fundamental factor in achieving project performance and quality. Hypothesis testing further confirms that these knowledge areas exert a direct and substantial effect on construction project quality, highlighting the pivotal role of knowledge and practical expertise in enhancing organizational outcomes.
2. **The Effect of Strategic Planning on Project Quality:** The findings revealed that strategic planning has a positive and moderate effect on improving construction project quality. Although the mean descriptive rating for strategic planning was relatively moderate (52.6%), statistical analysis demonstrated that strategic planning contributes to organizing resources and directing operations, thereby enhancing project quality.
3. **The Mediating Role of Strategic Planning:** The study empirically established that strategic planning partially mediates the relationship between knowledge areas and construction project quality. This signifies that the enhancement of knowledge areas and construction project quality. This signifies that the enhancement of knowledge and practical capabilities is associated with greater improvements in quality when an effective strategic plan guides project implementation and ensures alignment with organizational objectives.
4. **The Integrative Effect of Knowledge and Planning:** The results indicate that knowledge areas and strategic planning are complementary in enhancing project quality. Knowledge represents the foundational factor, while strategic planning functions as a mechanism for activating and leveraging this Knowledge in a practical manner that positively reflects on final project outcomes.
5. **Practical Significance of the Findings:** These conclusions underscore the necessity of focusing on building project knowledge capabilities and strengthening strategic planning within organizations implementing construction projects, particularly in fragile or complex environments. This approach

ensures the achievement of enhanced project quality and reinforces the capacity to address challenges related to resources, time, and cost.

#### **4.2. Recommendations**

Based on the study findings and statistical analysis, the following recommendations are proposed to enhance construction project quality through knowledge areas and strategic planning:

1. Enhancing Knowledge Capacities of Project Management Personnel:
  - Construction organizations are advised to invest in developing knowledge skills related to integration management, schedule management, cost management, resource management, and procurement management, given their direct impact on project quality.
  - Specialized training programs and workshops should be offered to enhance understanding of knowledge practices and their effective application across various project phases.
2. Strengthening Strategic Planning in Projects:
  - The preparation of clear and comprehensive strategic plans should be encouraged, goal and policy formulation, and the development of monitoring and evaluation mechanisms to ensure efficient project implementation.
  - Strategic planning should be adopted as a mediating tool to activate knowledge capabilities and achieve the highest levels of project quality.
3. Integrating Knowledge with Practical Planning:
  - Enhancing integration between knowledge capabilities and strategic planning is recommended to ensure that acquired knowledge is utilized systematically, thereby increasing the efficiency and effectiveness of project implementation.
  - Periodic monitoring and evaluation mechanisms should be established to measure the impact of knowledge application and planning on project quality, contributing to improved future performance.
4. Applying Strategies in Fragile Environments:
  - Given the influence of environmental context on project quality, organizations operating in fragile and complex environments should adopt flexible strategies that combine knowledge and strategic planning to ensure the achievement of desired outcomes.

5. Encouraging Future Research:

- Researchers are encouraged to continue investigating the impact of knowledge areas and strategic planning in diverse organizational contexts, with emphasis on the mediating effect of other potential factors such as organizational culture and institutional innovation, thereby expanding the scientific evidence base in this field.

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**Declarations**

**Ethical considerations**

This study involved human participants and adhered to the ethical standards and consent procedures mandated by Sana'a University and the Yemeni Ministry of Higher Education. All procedures complied with international guidelines for research ethics, and informed consent was obtained from all participants prior to data collection.

**Conflict of Interest**

The authors declare no conflict of interest.

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