

Research Proposal

Name:

Institution:

Course Title:

Assignment Name:

Instructor:

Date:

Research Proposal

Research Proposal Title

The title selected for the research project is “Design Change and its Impact on Project Performance in Terms of Time, Cost, Quality and Sustainability in the UAE Construction Industry” which highlights how design modifications influence key project metrics, emphasizing the significance of managing changes to ensure successful and sustainable construction outcomes in the UAE.

Background of the Study

In the United Arab Emirates, the “construction industry” is known for its rapid growth and ambitious projects. It is a significant contributor to the region’s economy, characterized by the rapid growth of construction and the complexity of its projects. However, design changes during the construction phase can significantly impact project performance across several dimensions including cost, quality, time, and sustainability. The rapid development of the construction industry and precise regulatory requirements have further posed unique challenges which need to be mitigated through effective communication and coordination among stakeholders. Changes and adjustments in design can cause a ripple effect and cost overruns, requiring additional time for approvals, modifications, and rework as well as the constant need for new materials, additional labor, and extended project duration which can disrupt the planned schedule and the overall budget of the project. Furthermore, design changes can be impacted if sustainability is not considered from the outset, resulting in less effective and costly last-minute design alterations in the project.

Rationale for the Study

The UAE construction industry is experiencing growth, with substantial investments in infrastructure and development projects. As projects become more complex and intricate, design changes are inevitable which significantly affect project performance. The rationale for conducting the research is that there is limited research specifically addressing the impact of design changes on project outcomes as addressing this critical gap would contribute to better project management practices, cost control, and sustainable construction in the UAE.

Research Question

How do design changes affect the performance of the construction project in the matter of time, cost, quality, and sustainability?

Aim of the Study

The main aim of the study is to investigate the effects of design changes on project performance in terms of time, cost, quality, and sustainability.

Objectives of the Study

- To identify the causes and effects of design changes in the UAE construction industry.
- To assess the impacts of design changes on the quality and timeline of the project.
- To explore and evaluate the cost and sustainability implications of design changes.

Review of the Literature

The study explores design changes in EPC namely engineering, procurement, and construction projects to identify causes of design changes, including insufficient attention to design, clients' inadequate strategic planning, contractors' on-site variations, and their design ability. Rahman et al. (2022) discuss three categories of design changes including the direct

impact of design change on the project, reciprocal effects on stakeholders, and far-reaching community impact. They recommend that enhancing project team integration and early contractor involvement can improve collaboration and coordination between design and construction teams effectively (Rahman et al., 2022). The research is relevant as it highlights the importance of managing design changes effectively to enhance overall project performance. Besides, it also presents a discrete-time, cost, quality, and environmental impact “trade-off problem” for the construction industry.

Design changes can affect construction projects but they can be managed to maintain high standards in the market, aligning with the industry’s goal to understand how design changes impact the performance of the project, particularly in terms of time, cost, and quality. The study “Value Management of Construction Projects” states that “design changes” produce “substantial changes in time and cost whilst delivering the project requirements” (Kelly et al., 2014), emphasizing that construction projects involve interrelated activities to meet client requirements but design changes can disrupt the process. Additionally, the value management of the project is important to control and reduce costs while maintaining or improving the project’s quality which can positively impact construction company performance. In this regard, the research study focuses on improving decision-making and achieving value for money in construction projects, highlighting the need for effective time and cost management strategies. Similarly, the research’s focus on the “impact of design changes” on quality and sustainability in the UAE construction industry complements the notion that design changes produce “substantial changes”.

Several factors including client-driven changes and regulatory requirements that construction projects often face during execution potentially influence the occurrence of design changes in the UAE construction industry. Therefore, Tomh (2022) emphasizes in his study that

poor communication and coordination among project stakeholders or other owner-related factors are significant contributors to design changes which need to be mitigated through the adoption of digital tools, thereby reducing the likelihood of disruption (Tomh, 2022). In addition, construction projects in the UAE industry often experience changes during work in progress which impact the performance of the project due to uncertainty which can disrupt the implementation of sustainable practices. The author emphasizes that such disruptive design changes can potentially hinder the adoption of sustainable construction practices as projects may neglect long-term sustainability goals and prioritize immediate time and cost savings. The present study involves understanding the perspectives of various stakeholders on the occurrence of the UAE construction industry's design changes and their impacts.

Research Methodology

The study draws on the body of knowledge related to “design changes” in construction projects, benefiting policymakers, practitioners, and researchers in the UAE. By addressing this critical issue, project delivery and sustainable construction practices can be enhanced and promoted. The research uses qualitative methodology of research to identify patterns and trends related to design change effects. A systematic review of peer-reviewed journals will be conducted to gather construction project-relevant literature on design changes, focusing on the impact of design changes and management. The study also reviews sustainability considerations in construction projects and how design changes affect them. For instance, the “structured methodologies” of value management used in the research “Value Management of Construction Projects” (2014) provide useful frameworks of “value engineering” and “functional analysis” for analyzing the impacts of change design in the research, systematically identifying and evaluating the effects of changes on project performance.

Data Collection Methods

The research utilizes interviews to gather insights from project stakeholders including owners, designers, and contractors regarding design change causes and consequences. Construction professionals, stakeholders, and project managers will be interviewed to gain insights into their experiences with design changes and explore challenges faced, coping mechanisms, and lessons learned. It also gathers data on project performance metrics, stakeholders' perspectives, and change order through the analysis of real-world construction projects in the UAE that experienced design changes. Interview responses and case study findings will qualify the impact of design changes to conduct an extensive review of the relevant literature for the identification of critical aspects of project performance. The qualitative analysis also includes practical recommendations from industry experts to minimize the negative impact of design modifications in order to contribute to better decision-making during design phases and design change management processes which “tends to be process-oriented” (Fellows and Liu, 2015).

Scope of the Research

The research contributes to the enhancement of the understanding of design change dynamics in the UAE construction industry and contributes valuable insights to project managers, industry stakeholders, and policymakers. In addition, the principles and methodologies of design change and value management can help in the integration of more effective strategies for managing design changes and mitigating their impacts on project performance in the UAE construction industry.

References

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