Proceedings of International Structural Engineering and Construction
Holistic Overview of Structural Design and Construction
Edited by Vacanas, Y., Danezis, C., Singh, A., and Yazdani, S.

ISSN: 2644-108X

THE EFFECTS OF POOR MANAGEMENT PRACTICES ON PROJECTS PERFORMANCE

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The construction sector in the Kingdom of Saudi Arabia (KSA) faces issues related to a lack of project management toolbox. Over two-thirds of public construction projects in the KSA suffer from schedule overruns that may exceed twice the length of the contracted period. The current paper aims to investigate how clients' management inefficiency plays a major role in delaying project execution and final product delivery, which may deviate from the contracted terms and expected standards. To achieve this objective, two case studies of serious schedule overruns were subjected to investigative research. Contractual documents, preliminary and modified project schedules, meetings minutes, and change orders were examined. Field visits and personal communications, as well as meetings and interviews with key players, were also conducted. The results of the analysis indicate that weak professional construction management coupled with a failure to introduce and implement solutions in a timely manner leads to serious schedule overruns. Delays impacted project life-cycle processes from initiation to project closing. The lessons learned from the many issues surrounding the two projects shed light on problem areas. These lessons also indicate the potential effectiveness of a pro-active management office, established early in the process, in preventing deficiencies in planning and managing projects.

Keywords: Saudi Arabia, Construction projects, Public sector, Schedule overruns, Project life-cycle, Engineering design consultant.

1 INTRODUCTION

The construction sector in the KSA is one the largest investment sectors worldwide and represents approximately 50% of the Gulf States' construction industry. Nevertheless, the sector faces issues related to ineffective and inefficient project management that undoubtedly results in wasted resources and damage to the image of the country's investment environment. For years, government entities have complained about incomplete projects.

A good number of researchers have dedicated their studies to identifying and listing the factors that lead to time and cost overruns. Love *et al.* (2009) suggested that there could be some inefficiency in project organization or perhaps an environment that promotes the occurrence of overruns rather than inhibits them from occurring; also Love *et al.* (2016) see the overruns as resulting from the actions of the project team members in the project organization. Doloi (2013) highlights the crucial nature of effective management and lists the significant factors for good performance. Turner and Zolin (2012) go even further, stating that projects have been completed on time and at cost but have left their investors dissatisfied because they have failed to deliver the desired benefits.

The issue can be addressed by asking "What if an owner's efficient management is in place?" This would ensure that a project meets its time schedule, is completed within the allocated funds, and according to specs and professional standards; lastly, but most crucially, it would ensure that the project output achieves the functionality objectives as appreciated by stakeholders, especially end users, over different timescales. The purpose of this research is to investigate how poor management throughout the construction project life cycle plays a major role in delaying project delivery, which may also deviate from the contracted terms and expected standards. The researchers' intention is to shed light on current practices in the construction sector in the KSA rather than generate statistically significant results.

2 RESEARCH METHODOLOGY

Reviewing previous studies on delays in completing projects in the KSA and their ensuing consequences, it can be seen that most of these studies somehow link delays to management inefficiency. In their review study, Alotaibi *et al.* (2016) pointed out that recommendations in previous studies suggest the critical factors that contribute to delays in building construction projects in the KSA could be managed using the principles of project management. Although researchers have tried to identify major sources of project delays and assign delay factors to key players, such as owners, contractors, and consultants, they have not approached the role of project management teams in alleviating them. Inefficient management practices accompany a project throughout its lifecycle, from initiation to closing.

This research is intended to expand our current understanding of overruns in project completion by critically examining the role of the owner's project management team. This examination was done through brain-storming meetings and semi-structured interviews as initial tools for collecting data. In addition, for a deeper understanding, two case studies of existing projects were also used to provide a clear picture of the current practices of constructability in the public sector.

2.1 Data Collection

Specific data from a large educational organization that runs dozens of projects were the basis for this study. Targeted groups were identified as the project management teams (PMT) of ongoing projects. Meetings were organized, followed by interviews to collect on-the-job data. The purpose of these tools is to obtain information about the degree of involvement of the PMT in project initiation and planning, design development, tenders preparation, bid solicitation, bid evaluation and contract awarding and to follow contractors' efforts to ensure execution according to specifications and a time schedule. The discussions focused on the application of sound project management practices as a means of meeting a project's objectives and whether their lack leads to overruns, which usually result in a dispute. The PMT's perspective on the reasons for not completing projects according to the contractual terms occupied a significant portion of this research phase. In addition to, which systematic and supportable methodology should be used to assess project management problems caused by the different stakeholders.

2.2 Case Studies

2.2.1 *Case study 1- Engineering college building*

The first case study was originally eight units of a one-story reinforced concrete building. The contract was signed in 2013 for the amount equivalent to US$3.5 million, and the entire project should have been completed within 14 months. This facility is built as part of an organizational

strategic and implementation plan to accommodate students in a rented property. In the process of handing over the site, it was discovered that design documents were not applicable to the assigned construction plot of land. The need is for 30,000 m^2, while the available area is only 10,000 m^2. The construction site was small and constrained by the campus master plan. Designs should therefore be modified to accommodate buildings within the 10,000 m^2. Changes were made to the type of structures and construction materials. These changes are among other notable risks that adversely affected the project, such as delays at the beginning, owner tardiness in decision-making, and scope changes, all of which resulted in a substantial delay in the project's completion date that exceeded three years. Moreover, the final product can barely carry out its intended purpose. Liquidated damages were applied.

2.2.2 *Case study 2- Medical college building*

The second case study is a three-story reinforced concrete building with annexes. The government entered into a contract with a general contractor in 2012 for the amount equivalent to US$35 million and the construction site was handed over to contractor on May 30, 2012. The contract duration was 42 months. This facility is also built as part of the organizational strategic and implementation plan to accommodate students in temporary buildings. During the handover process, the end-user decided to move the construction site to a plot of land outside the campus master plan and with a different topography from the one for which the designs were originally tailored. Consequently, it took 190 days to determine the "Bench Mark." The beneficiary also requested some alteration to the design documents. The contractor had carried out a redesign to accommodate the required changes but without conferring with the Engineering Design Consultant. The cost of these changes in the structural works amounts to more than 20% of the total cost of the structural components. Enormous changes and issues have caused delays that will significantly exceed the original contracting period. As per the contract, the project should have been completed by the end of 2015. Today, after exceeding another supplementary time period by 42 months, the project is still not completed and the progress as of mid-2019 is only 66%.

3 PROBLEMS DIAGNOSIS

The four key active players in the traditional design-bid-build of construction projects in the KSA are the owner, the engineering design consultant, the contractor, and the engineering supervisor consultant. This scheme also applies to the two cases studies under consideration. The discussion is structured according to the construction project's chronological development and will focus mainly on preconstruction practices, starting with the owner's role in initiating the project, the selection of the management team, qualifying and contracting with a design consultant, tendering and contracting with a qualified contractor, and the beginning of construction works.

3.1 Preconstruction Phase - Current Practices

Planning is the cornerstone that leads to effective performance throughout the construction project lifecycle. It lays the basis for achieving the project development goal and involves further development of the project in detail. This is a good reason for the project owner to assign a PMT as early as possible, to plan and coordinate the preparation of the project and develop the project master plan.

3.1.1 *Managing the design process*

Why does the phenomenon arise whereby most of the projects suffer from design errors? The root of the problem starts with managing the design process. Does the owner's PMT develop a request for proposal? Have they defined the project scope? Have they technically and financially evaluated the Engineering Design Consultant (EDC)'s proposals? Does the contracted EDC have knowledge and experience in designing educational buildings?

To effectively manage the design process and prepare construction documents, specific time and cost management skills are essential. The EDC should work toward limiting the number of errors and omissions to produce accurate cost estimates and an effective execution time period. Moreover, to protect professional liability, one should avoid any conflict between construction specifications and drawings. Dosumu (2018) found that traditionally procured projects contain 68% of the errors in contract documents among the procurement methods. Drawings contain the highest number of errors, followed by the bill of quantities and specs. Love *et al.* (2013) emphasized that many failures could have been prevented if design checks and reviews had been undertaken and appropriate managerial and project management practices implemented. Choudhary *et al.* (2017), found that the lack of interest by approving authorities to carefully check the design is one of the top causes of discrepancies.

3.1.2 *Procurement and contracting practices*

All government construction projects are subject to KSA government laws that are too traditional, and the principal method by which facilities are constructed is construction by general contractors. The traditional procurement method, design-bid-build, dominates and is extensively practiced. No collaboration exists between the design and construction teams. Contractors are involved only in bidding. Parties practice the business in various and isolated phases. This procurement method lacks innovation and does not make good use of new developments in design, materials, and construction approaches. The results of a survey conducted by Alofia *et al.* (2016) to identify the validity of recent claims that the procurement system in the KSA is broken showed that the procurement system is a major risk to construction projects and negatively affects them. Sodangi *et al.* (2017) emphasized that prioritization of the Public Works Contract provisions cause dissatisfaction among contractors. AlMunifi and Alameri (2019) proclaimed that contractors add up to 20% to the client's procurement procedure, approvals, and payment cycle.

4 FINDINGS, LESSONS LEARNED AND PROPOSAL FOR IMPROVEMENT

The issues that the two case studies gone through enabled the authors to develop a set of key questions that were enriched by referring to the standard project management processes, tools and techniques, and best practices. Analyzing the gathered data including the outputs of interviews with project managers provides researchers with first-hand information on how management procedures are considered the roots of poor project performance.

The flow diagram (Figure 1) shows the absence of a key player throughout the preconstruction phase, namely, the PMT. The EDC is also not involved in major activities. The roots of the ensuing complications in the construction phase can be clearly seen. These have serious impacts on project definition, engineering design, procurement, contracting and consequently on project performance. Kabirifar and Mojtahedi (2019) studied the impact of the engineering, procurement and construction phases on project performance and found that

engineering design, project planning and controls are significant factors contributing to project performance. Authors asserted that procurement is more important than the construction phase.

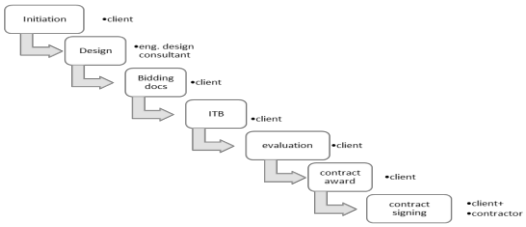

Figure 1. Procedures and key players throughout the preconstruction phase.

Lessons to be learnt: one must emphasize, that the PMT will make sure that the EDC satisfies the prequalification and post-qualification requirements. The EDC should have a professional team with technical capacities and knowledge of the regulations and standards governing the design and construction of buildings according to the serviceability. The EDC must evaluate site conditions and ensure compliance with the organizational master plan. To avoid late changes in the designs, the EDC should involve stakeholders and obtain their input. The EDC is under legal obligation to introduce effective buildability in design, accuracy of bills of quantities, the best construction techniques available, the best construction materials available, and, lastly, realistic cost and time estimates for project implementation. One must point out that bidders rely mainly on the construction time estimated by EDC and stated in the tender documents. Most bidders do not develop a preliminary execution plan to verify how realistic those time estimates are. On the other hand, the owner shall ensure the availability of financial resources.

In tendering and contracting, the EDC should support the owner in preparing the tender documents. Crystal-clear evaluation criteria should be outlined. The evaluation of bids shall not exceed the allocated time stated in the tender documents as bid validity. While the PMT should ensure the responsiveness of bids as part of the evaluation process, the technical evaluation of bids is of major importance and the EDC should take primary responsibility, given his involvement in preparing drawings and technical specifications. The output of the technical and financial evaluation shall result in determining the lowest-evaluated bidders to whom the contract should be awarded. The successful contractor should provide a preliminary schedule along with performance bonds as conditions for contract signing.

After examining procedures and practices in the preconstruction phase of the two case studies, and analyzing the feedback of professionals, Table 1 summarized the most inefficient management practices and remediation actions that does not go counter to the legal framework.

5 CONCLUSION

Given its various limitations, this paper is confined to a discussion of issues related to a project's preconstruction stage. Our findings are, to some extent, not in line with previous studies on the subject matter and region. The key to a project's effective performance is the existence of a pro-active management team established early in the process. The research will be extended to investigate the negative dimensions of the deficiencies in the early phases of the two case studies and their consequences on subsequent phases, from the lengthy efforts to obtain building permits, going through connecting to networks and services and ending with an unsatisfactory final product that deviates from the expected standards and from its intended purpose.

Table 1. Inefficient management practices and remediation actions.

Poor Management Practices	Remediation action	Facilitating entity
Project Management Team (PMT) appointed after contract signing	Assign professional PMT at Project initiation	Owner
Inefficient procedures for selecting a qualified Eng. Design Consul. (EDC)	Pre-qualification/shortlisting/ issuing RFP	PMT
The relevant experience of EDC to project type is not given good weight	Careful Proposals Evaluation and Contract Awarding	PMT + Tenders Committee
EDC lacks professional liability	Clear Contract Conditions	PMT+ EDC
The EDC works without consultation with the owner teams and end-users. The owner approves the final design without reviewing contents.	Discuss alternatives and concept design	PMT+EDC
	Develop concept design	EDC
	Reviewing and approving the concept design	PMT
	Developing Schematic Design	EDC
	Authority Approval	PMT+EDC
	Reviewing and approving the schem. design	PMT
	Developing Detailed Design	EDC
	Reviewing and approving detailed design	PMT
EDC not involved in tender preparation	Preparing tender docs to be in EDC contract	EDC+PMT
The PMT either not existed or unnoticed	Involvement of PMT in the Invitation To Bid	PMT+Tenders co
Inefficacies in selection the lowest-qualified bidder.	EDC should be involved in Bids Evaluation where EDC is technically knowledgeable.	PMT+ Tenders Committee+ EDC
Issues related to the readiness of construction site and permits	No contract awarding unless the site is ready, as the permits	PMT
Disconnection between EDC and owner after submitting design documents.	EDC Contract Extension as a Supervisor Eng. or extend obligation until the project closing.	PMT+EDC

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