

Elements Affecting Budget Performance In Libyan Construction Projects

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Abstract

There have been advancements in project management in recent years. However, issues with cost overruns have remained a significant factor in this industry. Therefore, the purpose of this paper is to identify the main causes of the budget increases in Libyan construction projects as well as the Key Success Elements that can help prevent the occurrence of these causes. This study reviewed the literature to identify the main causes of construction projects going over budget. Additionally, a review of some recent KSE literature has been done by the research. These studies concentrate on the variables that affect the overall cost performance of building projects. In order to address this, the researcher developed a list of KSEs and recommended additional research.

For this study, a positivist approach was used to implement the multi-case study method. The multiple-case method in the construction industry includes six distinct projects built by Libyan companies. As a result, the study was successful in identifying KSEs that affect project budget performance.

The void in the literature on KSEs was successfully filled by this exploratory study, which also proposed a list of KSEs that could be applied to improve budget performance. Furthermore, this study can serve as a basis for additional research based on the same ideas.

Keywords: Budget Overruns, Key Success Elements, Budget performance

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I. Introduction

One of the main goals of any construction client is to acquire a project within the estimated budget. Accordingly, a project is considered effective if it is finished on schedule, within budget, and to the client's satisfaction. In actuality, many construction projects frequently exceed their estimated costs, and as a result, a lot of research has been found to be impacted by these cost overruns in recent years (Enshassi et al. 2009; Sweis et al., 2013). Despite a great deal of research on project management, most projects did not finish within estimated budgets, according to Morris and Hough (1987). Additionally, they claimed that a lot of building projects are cancelled due to poor management, which raises costs over the estimated budget.

Numerous researchers use budget, quality, and time performance metrics to gauge a project's success (Chan et al., 2004). As a result, budget performance is a crucial factor that determines whether a project succeeds or fails.

Research Problem:

One dynamic industry that is constantly dealing with uncertainty is the construction sector. Due to these uncertainties and the large number of parties involved, cost management is challenging, which ultimately results in cost overruns. Thus, cost overrun is seen as a fundamental problem through the project construction phase (Chan, et al., 2004; Doloi, 2011). According to several authors, quality, time, and budget performance can all be used to gauge a construction project's success (Chan et al., 2004; Flyvbjerg et al., 2003). Additionally, several studies on project success have indicated that certain key success elements are necessary for the project to succeed [KES] and to achieve the aim and objectives of any project (Iyer and Jha, 2005). Put differently, according to some of these researches, the important success criteria can aid in enhancing budget performance and eliminating budget exceed. (Morris and Hough, 1987).

This study intends to identify the primary factors that lead to budget overruns in Libyan construction projects, as well as to ascertain the Crucial Elements of Success that can improving the performance of Libyan construction industry in terms of cost. This study aims to obtain these goals with aid of case studies of the Libyan projects.

A multi case study approach was chosen in order to accomplish the goals of the study six construction projects selected from Libyan industry with two distinct attributes-poor and strong budget performances will serve as the case study. Furthermore, throughout construction, Out of these six projects, three (projects 2, 4, and

6) have excellent budget performance, while the other three (projects 1, 3, and 5) have subpar budget performance during execution and present budget escalation.

Research Aim and Objectives:

The primary goals of this study are to identify the key success elements (KSEs) that contribute to budget performance development and the primary causes of cost overruns in Libyan construction projects. In order to accomplish this goal, the study would suggest the following goals:

- To determine the major causes of budget overruns in Libyan construction industry.
- To find the most recent research on [KSEs] in construction projects and to comprehend the body of literature currently available on the causes of budget overruns.
- To identify the key success elements that are essential for enhancing budget performance and preventing budget exceeds in construction projects.

II. Literature Review

Budget-effectiveness in construction industry:

The cost, technology, and procedures of the construction industry are constantly uncertain, making it a highly dynamic field. Budget overruns result from these uncertainties, the complexity of construction projects, and the growing number of stakeholders (Doloi, 2011).

A budget overrun occurs when the project's ultimate cost surpasses the projected budget (Avotos, 1983). However, as the project progresses, The presence of numerous parties, including owners, contractors, end users, materials, political and economic factors, project funding, and many more, causes the estimated cost to change. Avotos (1983) asserts that it is critical to account for these uncertainties in order to assess project overruns. According to some researchers, the cost target is set after the decision to start a project is made (Flyvbjerg et al., 2003; Odeck, 2004). Conversely, other researchers backed up the idea that budget overruns occur when the project's final budget at completion is compared to the initial contract value.

According to Le-Hoai et al. (2008), the size, type, and location of the project may or may not affect the extent of budget overruns. For instance, Eden et al. (2005) claimed that even though there are enough instances of budget overruns in the public sector, This is not to imply that private projects do not experience them. In fact, the study backed up the notion that private projects typically experience higher budget overruns.

In 2009, a group of researchers discovered that ongoing border closures caused material prices to rise, building material prices to fluctuate, suppliers monopolizing project materials, contractors' lack of planning, poor project management, and design errors were the main causes of cost overruns in the Gaza construction project (Enshassi, et al. 2009).

In the UK, Jackson (2002) conducted research to determine the causes of construction projects' final budgets exceeding their initial costs. In order to finish his research, the author also examined a few construction projects from the same year. He discovered that the main causes of budget exceed are owner design modifications made during the project's phases, incomplete planning, erroneous estimates, and design modifications made during construction. However, Olawale finished this research in 2010.

In addition to interviewing 15 professionals in the UK construction sector, Olawale (2010) polled 250 of the top construction and consulting firms in the country. Finding the causes of budget and delay overruns as well as practical mitigating measures was the goal of this study. In the first stage of the study, the author administered questionnaires; in the second stage, interviews were conducted. The author came to the conclusion that the top 20 causes of time and budget exceed also make it more difficult to control time and expense in construction projects. These factors are listed in the following table;

Table 2-1 Principal elements causing budget overruns collected from different studies.

Principal Elements of budget overruns
Project-related risk and uncertainty
Poor performance from the designated subcontractors and suppliers
Inconsistency between project participants
Contract and specification interruption
Finance and payment for completed work
Shortage of skilled labour
reliance on foreign sources such as materials
Unreliable interest rate
Reduced oversight and control
Government policies that are inconsistent
Design Modifications
Inaccurate estimation of the project's time or duration
Work complexity
Discrepancies in contract documentation
Price inflation

PM inexperience and a lack of suitable training
Unpredictable weather
material prices to rise
contractors' lack of planning
Lack of planning
Currency/exchange rate fluctuations
Design error
Corruption
poor project management

Following the examination of the primary causes of construction project budget exceed, the next section will list some of the projects' key success elements (KSEs) that affect budget performance. The goal is to determine which of such elements is more crucial in order to lower or avoid construction project budget overruns.

Key Success Elements influence cost performance in Construction Projects:

Cost, quality, and time are three factors that practically all project participants take into account, even though the project objectives differ based on who is evaluating it (Iyer and Jha, 2005). In order to identify the KSEs that can prevent cost overruns and directly impact budget performance, this section will review a few studies.

Research on the KSEs that affect cost performance is scarce, but the Chua et al. (1999) study is one of the few that has addressed this topic. Table 2-2 compares the KSEs for project overall performance with a list of key success elements for budget performance that the authors discovered. A number of KSEs that enhance budget performance are comparable to those that are discovered for overall performance. Two of those elements, however, were discovered to be among the most important ones that have a positive effect on project budget and can halt budget exceed. These elements include funding adequacy and budget updates.

Table 2-2 Main KSEs for budget performance identified by (Chua, et al., 1999)

KSEs
Updates to the budget
Sufficient blueprints and requirements
Adequacy of finance
Constructability
Project manager proficiency
Clear goals and realistic responsibilities
The dedication and participation of the project manager
Risks to the economy
Motivation under contract
Good inspections
Identification of potential risks
Official correspondence
Meetings and construction control

An extension of Chua et al.'s 1999 study was carried out by Kog and Loh (2012). In order to achieve three project objectives—budget, time, and quality—Kog and Loh aimed to identify ten KSEs for each project component, including structural and civil engineering projects, architectural works, quantity surveyors, and mechanical and electronic engineering works. These components, they discovered, prevented budget overruns and enhanced budget performance, time, and quality during the planning and execution stages.

Table 2-3 Synopsis of KSEs in construction projects (adapted from the 2012 study by Kog and Loh)

KSEs
Sufficient blueprints and specifications
Constructability
Ambition under contract
Project manager proficiency
Risks to the economy
Sufficient of finance
Reasonable responsibilities
Authorities for technical approval
The dedication and participation of the project manager
Meetings for construction control

The Chua et al. (1999) and Kog and LOh (2012) studies share certain similarities. The appropriate plans and specifications, constructability, economic risk, and project manager competency were among the commonalities among these studies.

Hwang and Lim conducted a new study in 2013 that was based on the Chua et al. study as well. The three project objectives—budget, time, and quality—as well as the KSEs for the main project participants—contractors, consultants, and owners—were investigated by Hwang and Lim. The authors also compared their findings with those of Chua et al. (1999), and this study included three new elements: the owner's participation and input, the suitability of the planning and control methods, and the owner's dedication to the predetermined timeline and budget.

Eleven elements were identified from the review of these previous studies as having a positive impact on enhancing construction project budget performance. These 11 elements were picked because they specifically affect budget performance and overlapped in the reviewed studies. The overlapped components from the three previously reviewed studies are listed here.

Table 2-4 KSEs [Done from this study]

KSEs
Sufficient funds
Sufficient blueprints and requirements
Constructability
Updates to the cost
Owner dedication
Owner participation
Risks to the economy
Project manager proficiency and experience
The project manager's dedication and participation
Clear goals and realistic responsibilities
Identification and control of risks

This research suggested a list of KSEs that improve the budget performance and including these elements in project planning and execution will improve performance within the budget. As a result, the researcher suggested that the lack of certain KSEs cause budget overruns in Libyan construction projects, while their presence can stop them. In the discussion section, this will either be accepted or denied.

III. Methods

This research used a multi-case study strategy to collect the data. Yin (2009) asserts that carrying out a multi-case study is stronger than carrying out a single case study as the analytical findings produced by the former are more robust compared to those of the single case study. This is due to the fact that multi-case studies can compare various circumstances. Thus, in order to examine their budget performance, six construction projects built by two Libyan contractor companies were selected three projects performed poorly in terms of budget, while the other three performed well. The primary goal of examining these cases is to pinpoint the key reasons of budget exceed in projects with subpar budget performance as well as the key success elements that were existent in projects with high cost performance and assisted in preventing budget overruns in those projects.

According to Yin (2009), case studies can be made to gather both qualitative and quantitative information. However, the purpose of this study is to use semi-structured interviews to gather qualitative data. Because they enable the researcher to gather data using both the pre-planned interview questions and any additional questions that may come up during the interview, semi-structured interviews are recommended for this study. To support the information obtained from the interviews; this study also makes use of data gathered from articles, journals, and various online sources. Semi-structured interviews and documentation are the methods used to gather data for each case study. Three seasoned experts were interviewed regarding the six case studies listed above, and each interviewee chose two projects to discuss, one performed well in terms of cost, and one performed badly. The data collected was used to analyze the case studies, identify the main success factors for successful projects, and determine the causes of budget overruns in unsuccessful projects.

IV. Results

In this study, semi-structured interviews were used to gather primary data. This study was able to collect qualitative information regarding six construction projects thanks to this data collection method. The

interview questions were divided into a number of categories based on the data gathered from the literature review and the preliminary exploratory interviews.

Three professionals from two distinct companies participated in the interviews. Information regarding both high- and low-cost performance projects was requested from them. Information from articles, journals, and various online sources was used to support and supplement the information obtained from the interviews in an effort to increase the study's construct validity. To aid in the data corroboration process, the respondents identified the specific projects they were referring to, despite expressing concerns about confidentiality.

Corporation A was responsible for Case 2 and Project 4, while Company B was responsible for Number 6. Although variations in corporate policies and structures may impact project outcomes, interviewees noted that the primary causes of cost overruns are usually unrelated to the company's policies and structures.

Projects with poor budget performance

This section's objective is to create a cross-case analysis of the subpar projects' budget performance. The case study reports for every case serve as the foundation for the analysis. Therefore, the analysis's results will be assessed to determine whether the dissertation's goals were met.

Consideration of Poor Cost Performance

It is crucial to explain the poor budget performance before beginning any analysis of these projects. The causes are below:

- *Project 2*
Due to the significant cost overrun—more than 20% of the original target—the project's overall performance was subpar. Additionally, the project also delayed for more than three months.
- *Project 4*
This project's overall performance was subpar as well due to budget overruns and delay for 22 days.
- *Project 6*
This project also failed to complete on the planned budget as the budget exceed 42% and 7 Months delays.

The increase of budget in these 3 projects is about 12%, and for this they considered as poor projects in their budget performance.

Principal Causes of Budget Overruns

Cross case analysis

A summary of the main factors that contribute to budget overruns is given in Table 4-1. The table makes it clear that similar factors contributed to some of the projects' cost overruns. For example, one of the things that led to cost overruns in projects 4 and 6 was a misreading of the contract.

Table 4-1 An overview of the major contributing elements of budget overruns in subpar projects

	Elements of budget overrun
Project 2	A project manager who lacks competence
	A bad relations among owner & contractor
	Client unwilling to support
	Frequent design change by owner
Project 4	incorrectly interpreting the terms of the contract
	Frequent design change by owner
	Inept preliminary planning
Project 6	Inadequate preliminary preparation
	Frequent design change by owner
	Time overruns
	misleadingly interpreting the contract's terms

There were some similarities among the main causes of budget overruns, even though they differed amongst the projects that were examined. One such element that was seen in all three of the underperforming projects was the clients' differing preferences for the design. Project 4 and 6 also showed inadequate preliminary planning and misreading of the contract specifications. These three elements have to do with

customers. In the aforementioned projects, the clients were in charge of choosing the contract forms and the subpar initial plans that were created. The client was also primarily responsible for the design changes that resulted in higher expenses. The interviewee [A] succinctly stated that the issues of a low-performance cost project are inherent in the work before it is even started. The study's findings corroborated the claim that the main causes of cost overruns are usually unrelated to the organization's policies and procedures.

Good Budget Performance Cases

The outstanding budget performance projects (Projects 1, 3, and 5) are taken into consideration in the cross-case analysis carried out in this section. This cross-case analysis was carried out in order to compare the excellent budget performance projects that were examined and determine the elements that support excellent budget performance.

Considering Effective Budget Performance

It is crucial to identify the elements that contribute to these projects' good budget performance before diving into the analysis of the KSEs that enabled their well budget performance.

- *Project1*

Case1this project performed very well in terms of budget as it completed fifteen days earlier. Additionally, some engineering values were used to save money. Because of these savings, this project was regarded as having good budget performance.

- *Project3*

For a number of reasons, this project was considered to have an excellent budget performance. To start, there were no budget overruns. Secondly, it had been completed ten weeks earlier. Third, approximately £35,000 was saved.

- *Project5*

Even so, case 5 was delayed by two weeks; it finished up on planned budget. As a result, this project was regarded as having good cost performance.

As is clear, none of the three projects went over budget. In fact, some of them had expenses that were lower than planned. Since the cases satisfy the criteria for good cost performance projects given in this study, they are classified as good budget performance projects.

KSEs Affecting Good Budget Performance

Cross-case analysis

Table 4-2 An overview of KSEs in projects 1, 3 and 5

	KSEs
Project 1	Contractor proficiency
	proper plans during the pre-construction stage
	Positive relations among the project's parties
	Accessibility of funds
	The architect's proficiency
	Owner's dedication and input
Project 3	Positive relations among the project's participants
	Contractors' Early Involvement
	Right contract form choosing
	proper plans during the pre-construction stage
	Accessibility of funds
Project 5	Sufficient specifications
	Positive relationship
	Choosing the appropriate contract form
	Contractors' Early Involvement
	Funding availability

The presence of particular KSEs helped projects 1, 3, and 5 achieve well budget performance. These KSEs were crucial in keeping project budget overruns from happening. Some of these KSEs were found to be common across multiple projects, according to the analysis. A friendly relationship between the project's

stakeholders, sufficient plans and specifications, and funding availability are a few KSEs that were shared by all of the projects. In a similar vein, the analysis demonstrates that early contract engagement and selecting the appropriate contract form were successful factors that helped to keep the budget from going over in projects 3 and 5.

The main causes of budget overruns, according to the interviewees, are usually unrelated to the organization's structures and policies. The interviewees agreed that the primary problems with projects were typically inherent to the project. Since it was observed that KSEs that promoted good budget performance had no connection to the contracting company's policies and structures, these claims were strengthened by the assessment of outstanding budget performance projects. It was also observed that the variations in KSEs between the projects were determined by the features of each project rather than by the internal procedures and frameworks of the contracting business.

Contrasting Projects with well and subpar budget Performance

The findings from every case study were used to perform a cross-case analysis between the subpar and excellent projects. As mentioned earlier, some KSEs were found in the excellent budget performance projects, which assisted in reducing budget overruns. On the other hand, some KSEs that could have helped reduce budget overruns were absent from the poor projects. The elements that affected the evaluated cases' budget performance are depicted in Figure 4-1.

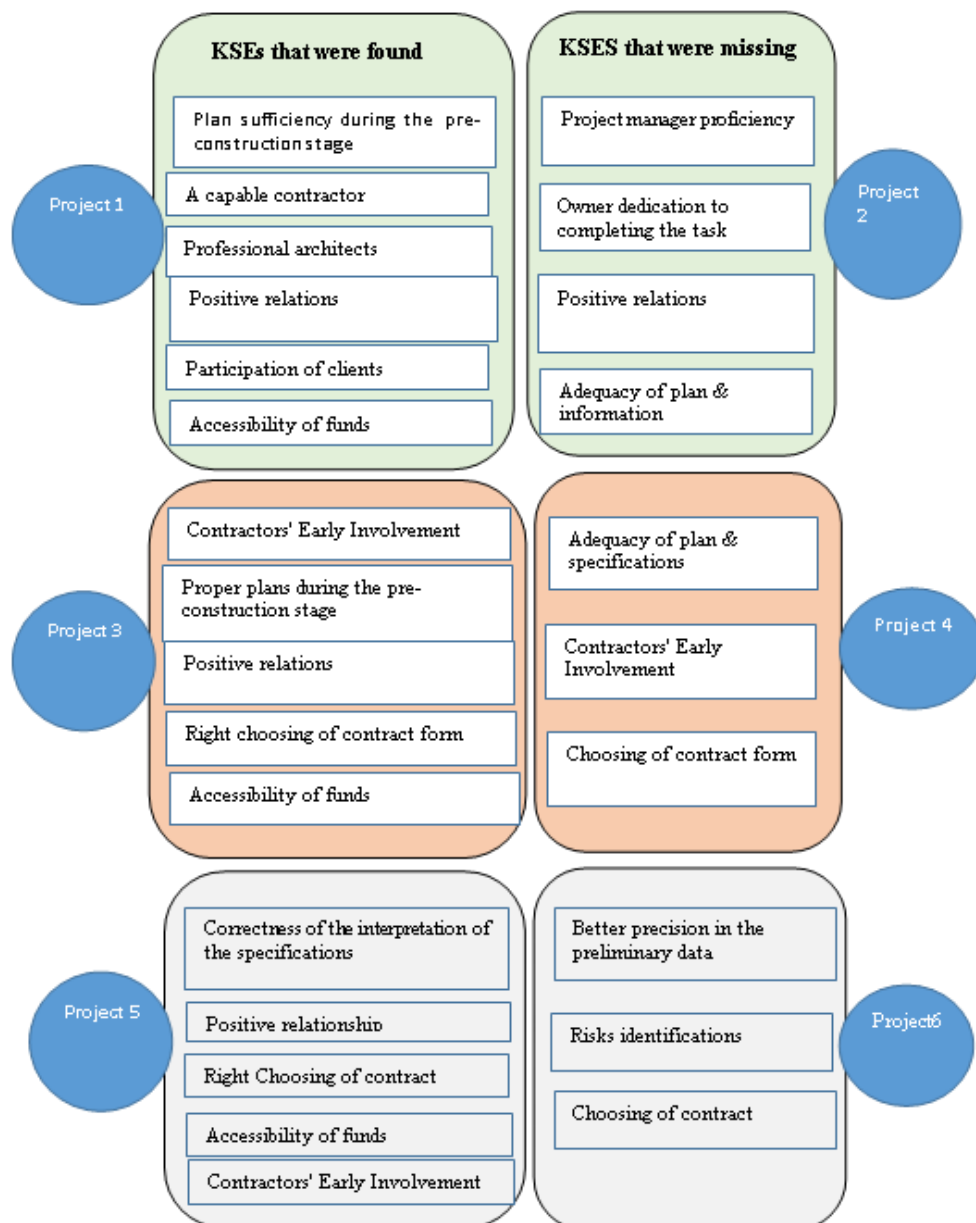


Figure 4-1 The KSEs that affected budget performance (Done in this study)

Two strategies were used to find the summary of all KSEs. The first method found the KSEs that were missing from projects with low cost performance, which were basically the elements that could have prevented these projects' budget exceed. Finding the KSEs that existed and were effective in preventing budget exceeding in excellent budget performance projects was the second approach.

Some KSEs that helped to prevent budget overruns in projects 1, 3 and 5, were not existing low budget performance project. For example, all projects with good budget performance had accurate plans and specifications, which are a success element. In contrast, all projects with low budget performance lacked this element, which was thought to be necessary to prevent budget exceed. Additionally, certain other components—such as contractor participation in the pre-construction phase, positive relationships between parties, the selection of an appropriate contract form, and client commitment—were present in projects with high budget performance but absent from the other three projects.

V. Discussion

Major Factors of budget overruns

This study looked at the major causes of cost overruns in two different ways. To identify the primary factors, a review of the body of existing literature was done first. In order to determine the primary causes of budget exceed in the regard of these subpar projects, an analysis was conducted on three projects with poor cost performance.

Findings from Existing Studies:

One of the main goals of the research is to identify the main causes of budget overruns on construction projects in Libya. As a result, some studies undergo critical evaluation to identify related or pertinent studies. Twenty major reasons for construction project budget overruns were identified by the literature review.

The author was successful in determining the primary causes of budget overruns in Libyan construction projects, and the evaluation in this study has been updated. Few researchers have recently tackled this subject, and there have not been any significant advancement in this area, making earlier research outdated. Consequently, the studies in the literature review can assist in achieving the main goal of this research. Table 2-1 in section 2.1.2 lists the main causes of budget overruns in Libya.

Outcomes of this study:

The study determined the primary causes of budget overruns in every project with subpar budget performance based on the case study reports. The results from these poor projects (2, 4, and 6) were also compared by the researcher. Therefore, the causes of budget overruns varied from project to project. These include client variance, an unsuitable contract type, delays, and inadequate initial design data. Table 4.1 in section 4.2 displays the results.

Connection between the Results:

A comparative analysis between the case study results and the criteria established in the literature review can support this research. However, the author noticed that this study and the literature review's list of factors were not determined in the same way. For example, each interviewee in Olawale's study used a different technology to identify the main causes of budget overruns. For this reason, each factor from the case studies is categorized, and an analysis of how similar the factors are to Olawale's and the literature review is conducted.

Table 5-1 Comparison of major elements of budget exceeding with existent literature

	Elements of budget overrun	Literature review	Causes
Project 2	A project manager who lacks competence.	PM inexperience and a lack of suitable training	Both factors are made the same by the project manager's incompetence.
	Bad relations among the contractor and the owner	Disagreement between project participants	Because of the terrible relationship between the project managers, this project has a contradiction problem.
	Unwilling owner to assist	Disagreement between project participants	The client's unwillingness is the result of a terrible relationship with the PM.
	Frequent design change by owner	Frequent design change	Both factors are equal in relation to the design modifications made during project execution.
Project 3	incorrectly interpreting the terms of the contract	incorrectly interpreting the terms of the contract	In this project, the clients did not fully understand the contract specifications, but the contractor did.
	Frequent design change by owner	Design Changes	Both factors are equal in relation to the design modifications made during project

Project 4			execution.
	Inept preliminary planning	Inept preliminary planning	Not all of the details were given to the client until the planning stage.
Project 6	Inaccurate planning	Inaccurate planning	The information in the contractor's tender was inaccurate due to the client's inadequate primary planning.
	Frequent design change by owner	Design Changes	Both factors are equal in relation to the design modifications made during project execution.
	incorrectly interpreting the terms of the contract	Interruption of contract & specification	They proceeded with the incorrect contract form and failed to comprehend the owner's contract specifications.

Discussion: It is evident from comparing the case study and literature review results that the majority of the elements of budget overruns are typical. Typical causes include:

- Insufficient training and experience
- The project parties' poor relationship
- Frequent design change by owner
- Contract form
- Inaccurate planning

It is implied that the budget overrun factors in projects 2, 4, and 6 could not be included in the literature review's categories of factors. Furthermore, the causes of budget overruns in poorly executed projects have been examined in this study and are included in the literature review's list of causes. This suggests that the literature review's list is a pertinent response to the budget overrun study. Because similar aspects of cost overruns appear in both the literature review's list and in this study, the results of the case studies in this research thus support the literature review, which can be thought of as the study's first objective addressed. This goal is, "to identify the primary causes of budget overruns in construction projects in Libya." These budget exceed contributing elements are shown in table 2-1 in section 2.1.2.

Verification of Objectives:

1. Because the results showed that some components were absent from the subpar project during the planning and construction phases, the goals and the proposal were validated based on cross-case analysis results from the projects with low budget performance [2, 4, and 6]. Additionally, the assessment of those projects revealed certain problems that could have been avoided during the execution phase; the absence of those elements in this project ultimately resulted in budget overruns.

Additionally, they reaffirmed based on cross-case analysis of the cost-effective project outcomes Projects 1, 3, and 5]. The analysis has shown that those were identified in these cases because certain elements were available during the planning and construction phases. Furthermore, these elements were thought to have a positive effect on these cases' budget performance. Therefore, these elements helped to prevent budget exceed in those projects.

2. The KSEs in those three cases were similar, according to cross-case analysis. That does not, however, imply that the unusual KSEs in these projects cannot prevent budget overruns. The results and the interviewees have shown that the KSEs vary depending on the project characteristics. Therefore, Table 5.4's results suggest that each of those KSEs can avoid budget overruns in all Libyan construction projects.

3. The choice of KSEs was independent of the companies' differences. The interviewees endorsed this notion and claimed that organizational traits such as organizational culture and structure had no bearing on the budget performance of those projects. As a result, even though they come from different companies, some KSEs in projects are similar.

KSEs in Construction Projects:

Findings: According to the cross-case analysis of these six projects, certain elements were present in excellent budget performance projects but absent from the others. Furthermore, some of those components were thought to be the key success elements (KSEs) for improving budget performance in projects with subpar cost performance. The KSEs are summarized in Figure 5-1.

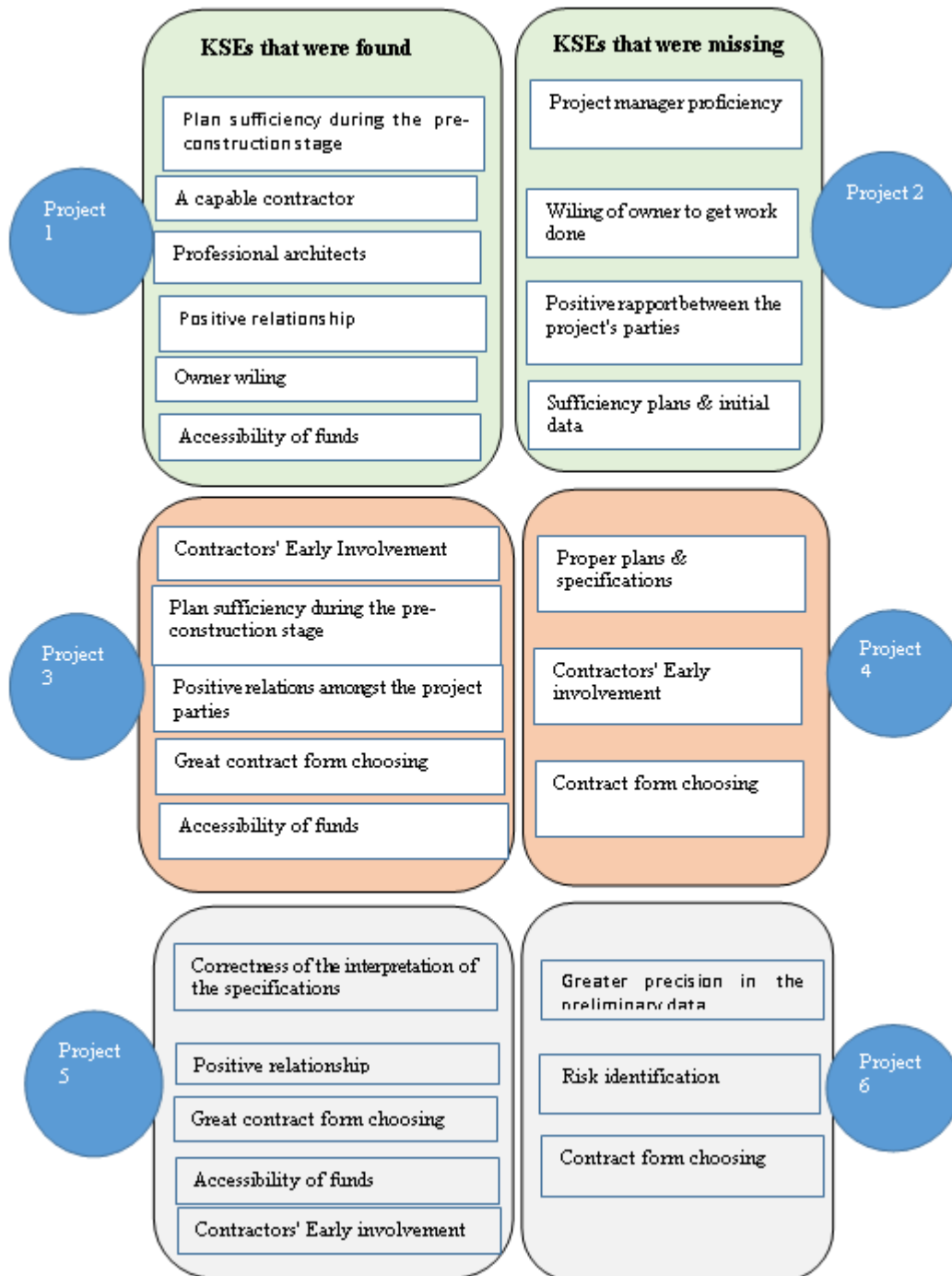


Figure 5-1 Summary of KSEs

Discussion: With the aid of the cross-case analysis between excellent and subpar projects, the researcher was able to create a longer list of significant KSEs on the budget performance in projects. Furthermore, this comparison identifies the lack of several KSEs in the low-budget performance projects.

Additionally, the KSEs list derived from the body of existing literature was compared to the list from this cross-case evaluation. This suggested that the list of existing literature contained only a small number of KSEs from those cases. However, the case studies emphasized three additional factors that were not included in this list. These include selecting an appropriate contract form, involving contractors early on, and maintaining positive relationships between project participants. Therefore, the research findings provide a conclusion with a definitive list of KSEs because the number of projects used in the multi-case study strategy was insufficient for generalization. The list of KSEs is included in table 5.8. Additional research can be done to complete this list.

Table 5-2 Recommended KSEs list that affect budget performance in the Libyan construction projects
[modified based on this study's findings]

Key Success Elements
Project manager proficiency
The contractor's proficiency
Owner willing to finish work
Proper specifications
Contractors' Early involvement
Positive rapport between the project's participants
Precise plans and preliminary information
Great contract form choosing
Risk identification
Accessibility of funds
Owner participation and feedback
Professional architects

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