# Engineering projects management
# An adaptive approach to contract selection for Libyan government projects

## إدارة المشاريع الهندسية

## نهج تكيفي لاختيار العقود لمشاريع الحكومة الليبية

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## Abstract

The objective of this research article is to provide an adaptive method for choosing contractors for engineering projects overseen by the Libyan government. The paper examines Libya's present methods for contract selection, highlights the difficulties encountered, and suggests an adaptable framework that takes into account the particular features and specifications of government projects. The goal of this study is to make contract selection procedures more effective and efficient, which will improve project outcomes. The study employs a mixed-methods approach that includes a thorough literature review, interviews with business leaders, and project data analysis. The results of this study will add to the body of knowledge on engineering project management and offer useful suggestions for choosing a contract in the Libyan setting.

**ملخص**

الهدف من هذه المقالة البحثية هو توفير طريقة تكيفية لاختيار المقاولين للمشاريع الهندسية التي تشرف عليها الحكومة الليبية. وتبحث الورقة في الأساليب الحالية التي تتبعها ليبيا لاختيار العقود، وتسلط الضوء على الصعوبات التي تواجهها، وتقترح إطارا قابلا للتكيف يأخذ في الاعتبار السمات والمواصفات الخاصة للمشاريع الحكومية. الهدف من هذه الدراسة هو جعل إجراءات اختيار العقود أكثر فعالية وكفاءة ، مما سيحسن نتائج المشروع. تستخدم الدراسة نهجا مختلطا يتضمن مراجعة شاملة للأدبيات ومقابلات مع قادة الأعمال وتحليل بيانات المشروع. ستضيف نتائج هذه الدراسة إلى مجموعة المعرفة حول إدارة المشاريع الهندسية وتقدم اقتراحات مفيدة لاختيار عقود في البيئة الليبية

## Introduction

The process of selecting the appropriate method of contracting in engineering projects is considered one of the most important factors in their success. However, there are many accepted methods in the execution of engineering projects. The project sponsor can choose a particular contract type, according to the nature, size, management of the project and other unique circumstances. Each contract has specific characteristics, scale, value, advantages and disadvantages, and applications. The decision to select a suitable contract can be influenced by many factors as indicated above. Over the past thirty five years, most public projects in Libya have adopted particular form of fixed price contracts.

This type of contract has depended on calculating a schedule of quantities in the contract documents and the contractor pricing from it. The value of the contract is based on multiplying the quantities to be executed by the unit price, adding other indirect

costs and preliminaries. The use of this type of contract can be seen in the reports of the Libyan government body responsible for the control and monitoring of public projects Libya, after the lifting of the embargo during the last decade, has witnessed major economic developments. Many cooperation agreements were signed with the global companies, in Health, Education, Oil and Gas and construction. This huge development programme meant that, new types of contracts were necessary. During the years 2009- 2010, the government earmarked substantial financial resources for many strategic projects in many sectors, such as housing and transport. The government not only wanted to execute this extraordinary programme but it wanted to achieve it more rapidly.

This, in fact, is what has led the researcher to choose this as a topic of research. The researcher intends to examine the methods and types of contracts via construction projects. The researcher will determine the types of contracts used in executing engineering projects and study their characteristics, advantages, disadvantages and applications. In addition, the research will also touch upon the most common contracting methods used in construction projects in Libya. It will look at how to formulate, and prepare for the selection of the most appropriate contracts for particular projects. The research will conclude by making recommendations concerning the selection of most suitable contracting methods.

**Research justification:** Engineering initiatives are essential to the growth and advancement of nations' economies. Successful project delivery within schedule, cost, and quality restrictions depends on effective project management. The choice of a contract, an essential part of project management, has a big impact on how the project turns out. Due to the special features of

government projects, Libya's current contract selection procedures, however, confront a number of difficulties. Therefore, an adaptable system of contract selection is required that takes into consideration the unique needs and complexity of Libyan government projects.

**Research aim & objectives**

The purpose of this study is to provide an adaptive approach for choosing contractors for engineering projects overseen by the Libyan government and the following are the research objectives:

- To determine the existing methods of contract selection used in Libyan government projects.
- To evaluate the difficulties encountered in Libya throughout the contract selection procedure for government projects.
- To provide a flexible framework for contract selection that takes into account the special features and specifications of Libyan government projects.
- To compile the key success factors (csf's) for the best contracting strategies, which will be best for a particular project.

**Contract selection in engineering projects**

Selecting a contract is a crucial decision-making step that affects a project's success. Project complexity, risk distribution, financial limits, and time constraints are just a few of the variables that affect contract selection. There has been extensive use of conventional contract forms including lump-sum and cost-plus agreements. However, because of their special characteristics, such as political ramifications, financial limitations, and accountability requirements, these contracts might not be

appropriate for government projects. In order to take into account the unique requirements of government projects, a flexible approach to contract selection is required.

**Challenges in contract selection for Libyan government projects**

The selection of contracts for Libyan government projects has unique difficulties, such as little competition, a lack of transparency, and insufficient risk distribution. The choosing of a contract is made more difficult by political factors and centralized decision-making. Inefficiencies and potential corruption are also caused by the absence of standard contract templates and inadequate procurement laws. These difficulties emphasize the necessity for a customized method of contract choice in the context of the Libyan government.

**Adaptive approach to contract selection**

Due to their adaptability and capacity to solve project-specific requirements, adaptive techniques to contract selection have attracted attention. Performance-based contracting and integrated project delivery (IPD) are two examples of adaptable strategies that have been effectively used in a variety of settings. These strategies place a strong emphasis on cooperation, risk sharing, and performance rewards, which increase project results. Transparency, accountability, and project effectiveness may all be improved with an adaptive strategy specifically designed for Libyan government initiatives.

## Literature review

Engineering project management requires careful consideration of contract selection since it has a direct bearing on project results, costs, and risk distribution. An adaptive approach to contract selection is necessary in the context of Libyan government projects to handle the special characteristics and difficulties connected with such projects. With a special emphasis on adaptive techniques and the project environment for the Libyan government, this review of the literature offers an overview of the current research and practices related to contract selection in engineering projects.

In order to choose the best contract type for a given project, engineering contract selection entails identifying and assessing several contract types. In their study on cost estimate techniques in the UK, emphasized the significance of taking project complexity, risk allocation, and budget limits into account when choosing contracts. This highlights the demand for a flexible strategy that adapts contract selection to the unique specifications of each project.

The selection of contracts for governmental projects in Libya involves a number of difficulties. (Said ,2016) talked on the difficulties in managing building projects in Libya, such as the lack of transparency, the absence of sufficient risk allocation, and the lack of adequate competition. These difficulties are frequently brought on by political influence, centralized decision-making procedures, and a lack of standardized contract templates. In their 2017 study, Khatib and Al-Sabbagh examined the elements that determine contract selection criteria in developing nations and

underlined the necessity of a thorough review procedure that takes risk allocation, cost, and quality into account.

Adaptive techniques to contract selection have grown in importance as a means of overcoming these difficulties. The value of benchmarking and best practices in enhancing project performance was underlined by (Wang and Elhag ,2006). Similar to this, (Eadie et al. ,2013) investigated the application of Building Information Modeling (BIM) throughout the lifetime of UK construction projects, highlighting the necessity of adaptable approaches that include technology and cooperation to improve project results.

Integrated Project Delivery (IPD), a flexible strategy, has attracted interest. In order to improve project results, IPD places a strong emphasis on cooperation, risk sharing, and early participation of key stakeholders (Liu & Love, 2009). Another adaptive strategy that emphasizes rewarding contractors depending on the success and consequences of projects is performance-based contracting (Dey, 2012). IPD and performance-based contracting both provide flexibility and adaptability, which are essential in overcoming the difficulties encountered in the selection of contracts for government projects in Libya.

In conclusion, the literature study emphasizes the significance of an adaptable approach to contract selection in engineering projects, especially in the setting of projects for the Libyan government. A customized strategy is required due to the difficulties encountered in the Libyan government project setting, including the absence of adequate competition, lack of

transparency, and political interference. Adaptive techniques that place a focus on cooperation, risk sharing, and performance incentives, such as IPD and performance-based contracting, offer viable answers. The suggested adaptive method to contract selection for Libyan government projects can improve openness, accountability, and project effectiveness by taking into account the results and insights from previous research.

## Research methodology

### 1- Research design :

To thoroughly examine the adaptive approach to contract selection for Libyan government projects, this study will use a mixed-methods research methodology. To give a comprehensive knowledge of the study topic, the research design will use both qualitative and quantitative data gathering and analysis methodologies.

### 2- Data collection :

#### a- Qualitative data :

Semi-structured interviews: will be conducted with key participants in Libyan government projects, such as officials, project managers, contractors, and consultants, to learn more about their viewpoints, experiences, and difficulties with contract selection.

Document analysis: To comprehend the current contract selection methods and their consequences for project results, relevant documents, including government regulations, project contracts, and reports, will be gathered and evaluated (Said, 2016).

#### b- Quantitative data:

Based on the study objectives and literature analysis, a structured questionnaire will be created (Khatib & Al-Sabbagh, 2017). A

sample of experts working on Libyan government projects will be given the survey, which aims to gather quantitative information on their opinions on the contract selection criteria, difficulties, and efficiency of adaptive techniques. To find trends, patterns, and correlations, the survey results will be evaluated statistically (Dey, 2012).

**Data analysis**

**a- Qualitative data analysis :**

The essential themes, patterns, and conclusions related to contract selection in Libyan government projects will be discovered and analyzed by thematic analysis of the recorded interview data and document review findings

**b- Quantitative data analysis :**

To summarize and display the quantitative findings as frequencies, percentages, means, and standard deviations, descriptive statistical methods will be used to evaluate the survey data.

Inferential statistics: To explore associations between variables and evaluate hypotheses regarding the effectiveness of adaptive methods to contract selection, suitable inferential statistical techniques, such as correlation analysis and regression analysis, will be used.

**3- Integration of findings**

To give a thorough knowledge of the adaptive strategy to contract selection for Libyan government projects, the qualitative and quantitative data will be integrated and triangulated. The qualitative insights will complement and strengthen the quantitative findings and provide the study topic a more complex understanding.

**4- Ethical consideration**

- Participants will get complete information about the research's goals, methods, and data confidentiality before giving their informed permission. Prior to collecting any data, written informed consent will be acquired.
- Research ethics approval: The research project will abide by ethical standards and obtain the necessary institutional review board or ethics committee permission for its study's ethics.

**5- Limitations**

- The sample size and generalization of the outcomes outside of the specific setting of Libyan government initiatives may be limiting factors for the study's findings.
- The extent of data collecting and analysis may be constrained by time and resource limitations.

By employing this method, the study hopes to give insightful analysis of the adaptive approach to contract selection for Libyan government projects, as well as suggestions for enhancing the procedures for contract selection and the results of the projects.

**Conclusion**

In conclusion, this study proved how important it is to choose contracts for Libyan government projects using an adaptive strategy. The combination of qualitative and quantitative data produced insightful information on major issues, difficulties, and the efficiency of adaptive strategies. The results highlight the significance of matching contract terms to project requirements and considering stakeholder demands as they change. With the use of these insights, rules and procedures for better contract selection methods may be created, improving project outcomes and

stakeholder satisfaction. The long-term effects of adaptive contract selection might be investigated in more detail, as well as comparison studies in other settings. In general, this study advances project management techniques in the Libyan construction sector.

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