

6-30-2021

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How to Cite This Article

Abdullah, Atta K. and Shonm, Payjor A. (2021) "Delay in Construction Projects due to Lack of Procurement in Sulaimani," *Polytechnic Journal*: Vol. 11: Iss. 1, Article 22.

DOI: <https://doi.org/10.25156/ptj.v11n1y2021.pp126-133>

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Abstract

The study was conducted to find the effect of procurement unit (PU) on the performance of institutions that are under the government's ministries. The study concluded that the constructional sectors that had PU offered more capable services by a relative important index (RII) proportion of 85%. The practical part of the study was done through a questionnaire that was distributed among 10 professional managers, who had actual experience in the process of constructional duties. The study was conducted on the percentage of each category factor that affected the PU. The theoretical part proved that a lack of management was the most sensitive factor with a frequency proportion of 11.6%.

Keywords

Contracts and tendering, Delivery, Procurement unit, Purchase and sell, Supply

RESEARCH ARTICLE

Delay in Construction Projects due to Lack of Procurement in Sulaimani

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Received: 15 January 2021

Accepted: 11 May 2021

Published: 30 June 2021

DOI

10.25156/pj.v11n1y2021.pp126-133

ABSTRACT

The study was conducted to find the effect of procurement unit (PU) on the performance of institutions that are under the government's ministries. The study concluded that the constructional sectors that had PU offered more capable services by a relative important index (RII) proportion of 85%. The practical part of the study was done through a questionnaire that was distributed among 10 professional managers, who had actual experience in the process of constructional duties. The study was conducted on the percentage of each category factor that affected the PU. The theoretical part proved that a lack of management was the most sensitive factor with a frequency proportion of 11.6%.

Keywords: Contracts and tendering; Delivery; Procurement unit; Purchase and sell; Supply

INTRODUCTION

Procurement unit (PU) is a service sector that was created recently around two decades ago. Its main role is to provide technical constructional services, transportation services, delivery of goods and materials, and supply skilled and unskilled workforce, in addition to providing construction packages to governmental institutions who need specific services (Presidency, 2016).

Several projects in Sulaimani faced suspension, stopping temporarily and arranging the variation orders due to some deficiencies in the design or in the contract, therefore most of the projects stopped from the beginning for several months. This is due to the lack of experience of the designing staff. This phenomenon was not seen in the units that had installed PU.

The PU establishment types are not limited nor have any boundaries, each unit could be established according to circumstances and its criteria, which depend on various factors. The structure of establishment of a PU is according to the target functions that are proposed, therefore, establishing any unit's resources may not be similar to the other various PU establishments. Each unit depends on several resources (key persons, clients, and templates) and factors (characteristics and reasons) during establishment, but similarities may occur between them (Programme, 2016).

Practical Part

For the purpose of practical data collection, a survey was conducted. The forms were distributed among ten professional managers of institutions who had actual experience in the process of General Contracts Agreement for constructional institution's projects. The managers initially had not established the PU sector, then after a period they decided to establish the PU. The role of PU is indicated by the sensitivity of each factor that affects the performance of projects.

Responsibilities of PU

The Procurement Unit is an outfit with the responsibility of superintending procurement activities as preparing projects, designing, tendering, offering engineering services for implementation, supervision, observation, quality control, security, health and safety of the projects, and allocating budgets.

Delay in construction is defined as the time overrun either beyond the completion date specified in the contract, or beyond the date that the parties have agreed on for delivery of the project (Sadi and Al-Hejji, 2006); (Abisuga et al., 2014). There were many different resources that caused delay, lack of PU being one of the most important resources, therefore, the study focused on the role and duties of PU.

The role of PU was indicated by the impact factors that affected implementing the projects, the impact factors were found through relative important index (RII) %.

Theoretical Part

To obtain the theoretical data collection for the study, various related researches were studied and reviewed.

LITERATURE REVIEW

The study investigated the related researches and papers, after reviewing, 21 various factors were selected from previous researches.

The Procurement Standard Documents that are issued by the World Bank, includes International Competitive Bidders' Instructions. According to these instructions, all the tendering processes should be transparent and the advertisement should be enhanced as wide as possible and prove equality base. Performance condition is one of the requirements and the bidders must apply a written acceptance according to the standard specifications that the tender requires (Presidency, 2016). The United Nations Development Program (UNDP) established the biggest PU's to serve the country offices and other businesses worldwide. PUs have profited around \$3b worth of goods for their respective companies, the service aims to ensure the best transparent purchasing process to deliver the best value for money (Programme, 2016).

Electronic Tendering (e-Tendering) is a smooth online tendering tool used through the internet. The role of e-procurement is "shifting from reducing costs to creating supply value for the company". Studies in several countries have been conducted and indicate that there are some performance factors, and moreover sorted the factors according to their impact factors. All the researches, titles, author names, and year of issues are summarized in Table 1. A capable PU manager should focus on two major aspects, first is Supplier Selection and the second is Evaluation. It has been found that the progress of procurement still needs growth, especially in the following fields: (1) Planning process, (2) announcements, (3) bidding submission and evaluation of the bidders, (4) tenders evaluations, (5) contract awarding, and (6) implementation of the contracts (Commission, 2015). The study was conducted to measure an inventory for a periodic review model. The models include price limits and fix ordering costs in addition to unit procurement holding and shortage cost. The optimal policies which jointly maximize the discounted expected profit over a finite planning horizon. The forms of the optimal procurement policy under general price demand were characterized (Hakan Polatoglu, 2000).

A generalization of Murty's procurement problem developed an approach using duality to exploit the special structure of this problem. Using the dual approach on Murty's original problem, it was able to solve large problems (1840 integer variables) with very modest computational effort.

The main characteristic of the advanced idea was using the evaluation of the dual problem to make a high-quality practical solution to the original problem, it is possible to use a very simple subgradient algorithm to solve the dual successfully (Eldon and Gunn, 1986).

As a result of studying all the researches, it was found that there were only five factors selected as "important factors", which were Lack of Management and planning, Designer and Consultant, Finance, Contractor, and Contractor's Experience.

These factors were different from the factors that were selected through the questionnaire in the practical part of this study. As a result, the previous studies have neither considered establishing PU nor the selected factors that affect delay in Sulaimani.

OBJECTIVES

One aim was to determine the role of PU in the performance of projects and the effects of PU on decreasing or preventing delay in the stages of forecasting, designing, planning, and implementation. This study was focused on finding the resources of delay and sorting them according to their impact factors. Another aim was to highlight the role of PU in giving advice for the constructional sectors to be more capable in implementing projects.

METHODOLOGY

The study depended on practical and theoretical data reviews, as follows:

Practical Data Collection

For the purpose of practical data collection, 15 questionnaire forms were prepared, as shown in Table 2. The forms were distributed among 15 expert managers. The institutions that were picked did not have an established PU, eventually these managers decided to establish PU in their institutions and stay on as managers. These 10 experts had enough experience in both situations, with and without PU. The experience of these managers was between 1 and 20 years in managing constructional sectors. The questionnaire form consisted of 20 different questions under four categories:

Table 1: Frequency of used factors in previous researches

Authors	Title of the research	Categories		Contractor	Delivery	Contractor's Experience	Contractor category				Procurement suppliers	
		Country	Year				Management & planning	Materials	Labor	Subcontractor		equipment
Sadi and Al-Hejji	Causes of delay in large construction projects	Saudi Arabia	2006	1								
Al-Momani	Construction delay: a quantitative analysis	Jordan	2000		1							
Mansfield et al.	Causes of delay and cost overruns in Nigerian construction project	Nigeria	1994	1		1	1					
Ogunlana and Promkuntong	Construction delays in a fast-growing economy: comparing Thailand with other economies	Thailand	1996			1						
Chan and Kumaraswamy*	Compressing construction duration: lessons learned from Hong Kong building projects	Hong Kong	2002			1						
Abdalla and Odeh	Causes of construction delay: traditional contracts	Ghana	2002			1	1		1	1		
Yaw Frimpong	Causes of delay and cost overruns in construction of groundwater projects in a developing country; Ghana as a case study	Ghana	2003	1		1	1		1			

(Contd...)

Table 1: (Continued)

Authors	Title of the research	Categories		Contractor	Delivery	Contractor's Experience	Contractor category							Procurement suppliers
		Country	Year				Management & planning	Materials	Labor	Subcontractor	equipment	Fault		
Aibinu and Jagboro	The effects of construction delays on project delivery in Nigerian construction industry	Nigeria	2002	1										
Manavazhia and Adhikarib	Material and equipment procurement delays in highway projects in Nepal	Nepal	2002	1	1		1				1			
Kometa et al.	Attributes of UK construction clients influencing Causes of delay and cost overruns in construction of groundwater projects in a developing countries; Ghana	UK	1994	1	2		1							
Frimponga* and Oluwoyeb			2003	1	1	2	1	1	1	1		1		
Total of individual factors				6	1	6	8	4	3	3	2	1	2	
Authors		Owner category			Litigations	Designer and Consultant	Other categories					Clients		
		Owner	Finance	Change of Quantity			Decision Making	Fluctuation	Weather	Site location	Unforeseen circumstances			
Sadi and Al-Hejji		1				1								
Al-Momani		1	1	1		1			1	1				
Mansfield et al.			1			1		1						
Ogunlana and Promkuntong			1			1						1		
Chan and Kumaraswamy*				1	1					1				
Abdalla and Odeh		1	1		1									

(Contd...)

Table 1: (Continued)

Authors	Owner category				Designer and Consultant	Other categories			
	Owner	Finance	Change of Quantity	Decision Making	Litigations	Fluctuation	Weather	Site location	Unforeseen circumstances
Yaw	1	1				1			
Frimpong									
Aibinu and Jagboro		1		1					
Manavazhia and Adhikarib	1					1			
Kometa et al.		1					1		
Frimponga* and Oluwoyeb		1							1
	4	7	2	3	2	2	1	1	2

Table 2: Example of a questionnaires form

Questionnaire form						
The effects of procurement unit (PU) on the performance of projects						
This form should be filled out only by managers that have a minimum experience of 1 year in managing constructional subsectors before and after establishing PU.						
Experience in managing constructional sectors () years						
Name of Directorate: ()						
Kindly select the answer by ticking the appropriate impact, between 1 and 5						
S. No.	Questions	Impacts				
Design category		1	2	3	4	5
1	1 To what extent can PU offer a better design?					
	2 To what extent can PU help in planning?					
	3 To what extent can PU facilitate preparing the specifications, drawing and bill of quantities?					
	4 To what extent can PU offer a better technical service?					
Tendering category		1	2	3	4	5
2	5 To what extent can PU help in implementing projects through tendering?					
	6 To what extent can PU help in preparing tenders for projects in a better quality?					
	7 To what extent can PU help in preparing contracts for projects in a better quality?					
	8 To what extent can PU help analyze tenders of projects in a better quality?					
	9 To what extent can PU help in selecting the most appropriate bidder in the projects?					
	10 To what extent can PU help in selecting the most appropriate contractor?					
Construction category		1	2	3	4	5
3	11 To what extent can PU help projects to avoid losing time?					
	12 To what extent can PU help projects to avoid losing money?					
	13 To what extent can PU offer a better implementation?					
	14 To what extent can PU control performance, material and supervision quality?					
	15 To what extent can PU control the health and safety (HES) of the projects?					
	16 To what extent can PU offer better logistic services?					
	17 To what extent can PU avoid stoppage of works during the implementation stage?					

(Contd...)

Table 2: (Continued)

Contact with subsectors category	1	2	3	4	5
4 18 To what extent can PU decrease the misunderstanding between subsectors?					
19 To what extent can PU help solve problems without interference from the subsectors?					
20 To what extent can PU facilitate routine works that are related to the accountant subsectors?					

(A) Design, (B) tendering, (c) construction, and (d) contacts with subsectors, as summarized in Table 2.

The forms had been sent to the managers through Google Forms platform. The answering process for each question was limited to five impact degrees from 1 to 5 as follows:

(1) Not important, (2) low importance, (3) neutral importance, (4) important, and (5) very important.

Of the 15 managers, 10 completely filled out their forms. These 10 reply forms were collected, analyzed, and statistically treated with the RII Equation 1, as shown in Figure 1:

$$RII = \frac{\sum_{i=1}^5 W_i * X_i}{A * N} \quad (1)$$

Where:

RII: Relative importance index, W: Weighting given to each factor by the respondents and ranges from 1 to 5.

X: Frequency of the response given for each cause, A: Highest weight (i.e. 5 in this case), n: Total number of respondents (which is 10 for this case).

Theoretical Data Collection

For the purpose of theoretical data collection, the related researches were reviewed, their key persons, resources, and frequencies were recorded, as summarized in Table 1 and shown in Figure 2.

RESULTS AND DISCUSSION

Experimental Part

Establishment of PU was affected by the outcome of each individual factor analyzed through the questionnaires. The impact factors (RII%) were calculated through Equation 1. All the 20 main factors were sorted according to their RII% from greatest to least, as shown in Figure 1.

The factors were classified into four categories: (I) Design, (II) tendering, (III) construction, and (IV) contact with



Figure 1: Resources impact factors resulted from questionnaire

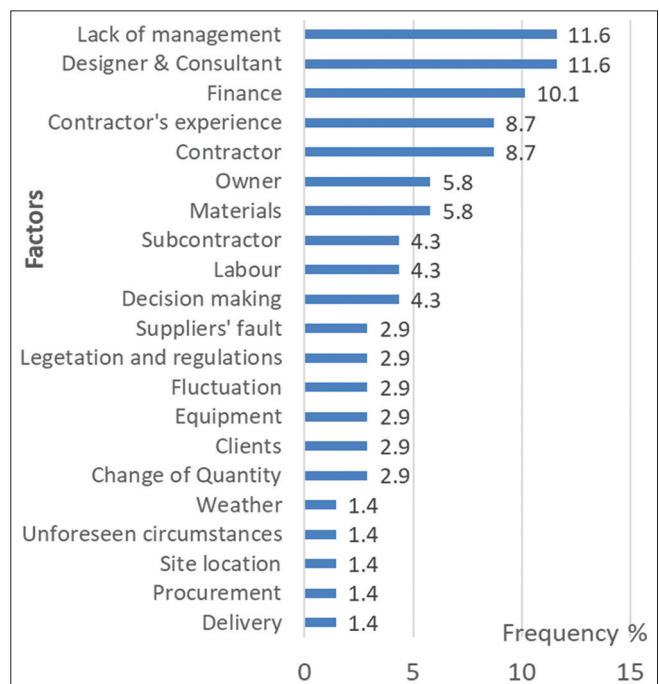


Figure 2: Resources factors' frequency resulted from previous researches

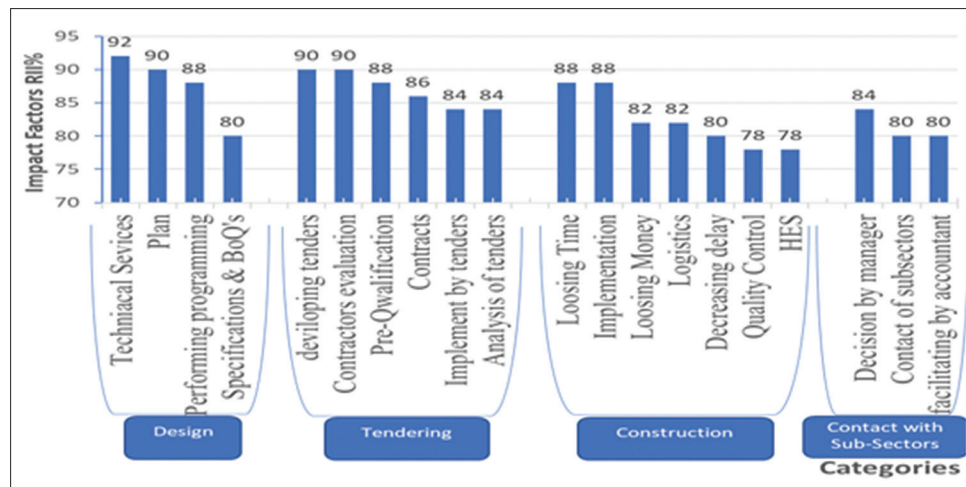


Figure 3: Resource factor categories' classification and their impacts on procurement unit

subsectors according to the questionnaire form, as shown in Figure 3.

- The resource categories' impact factors (RII) were calculated, as shown in Figure 3. The results were as follows:
 - The most effective resource category was design, with an impact factor of 92%
 - The other resource categories were tendering, construction, and contact with subsectors, which had impact factors of 90%, 88%, and 84%, respectively.
- The importance of the other resources was sorted according to their RII impact factors, for each category from highest to lowest, as shown in Figure 3
- The results showed that the sectors that had PU offered an increased service rate to the institutions, in contrast with the institutions that did not have PU, with an average impact factor of 85%
- The impact factors for each individual factor within the categories (design, tendering, construction, and contactor) are indicated, as shown in Figure 3.

Theoretical Part

The study reviewed related researches and papers, and selected 21 various factors from previous researches. Their frequencies were recorded and sorted from highest to lowest, as shown in Figure 2.

CONCLUSIONS

The study was conducted to find the effect of PU and was carried out in two parts, as follows:

Practical Part

Through a questionnaire review, it was concluded that the PU establishment increased the role of constructional

processes by an impact factor (RII) of 85%. On the other hand, the study investigated that the delay in constructional projects was not the contractor's fault only, there were several factors that caused delay. The categories, factors, and their impact rates are shown below.

- Design category was increased by an impact factor of RII 92%, and the design category was affected by four factors with an impact factor between 80 and 92%
- Tendering category affected the promotion of projects by an impact factor of RII 90%, and this category was affected by six factors with and impact factor between 84 and 90%
- Construction category affected the development of projects by an impact factor of RII 84%, and this category was affected by seven factors with an impact factor between 78 and 88%.
- Contact with subsector's category affected the performance of projects by an impact factor of RII 82%, and this category was affected by three factors with an impact factor between 80 and 84%.

Theoretical Part

It was concluded that the PU establishment had a main role in the modification and improvement of constructional processes. According to the researches reviewed, the five most efficient resources were (I) lack of management and planning, (II) design and consultant, (III) finance and payments, (IV) contractor experience, and (V) contractor, with frequency ratios of 11.6%, 11.6%, 10.1%, 8.7%, and 8.7%, respectively.

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