

STRATEGY OF MINIMIZING DELAY IN PUBLIC CONSTRUCTION  
PROJECTS THROUGH IMPLEMENTATION OF ELECTRONIC  
PROCUREMENT SYSTEM

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A project report submitted in partial fulfilment of the  
requirements for the award of the degree of  
Master of Engineering (Construction Management)

School of Civil Engineering  
Faculty of Engineering  
Universiti Teknologi Malaysia

December 2019

## **ACKNOWLEDGEMENTS**

Alhamdulillah, all praises be to Allah S.W.T, The Al Mighty, The Most Gracious and The Most Merciful.

First of all, I wish to express my sincere appreciation to my supervisor, Professor Ir. Dr. Rosli Mohamad Zin, for encouragement, guidance, critics, advices, motivation and friendship. Without his support and interest, this work would not have been the same as presented here.

I am grateful to many people; from researchers, academicians, and practitioners, who have contributed towards my understanding and thoughts during preparing this research.

My fellow postgraduate students at UTM Universiti should also be recognised for their support. My sincere appreciation also extends to all my colleagues at ThiQar University for their support and encouragement me, and to others who have provided assistance at various occasions. Their views and tips are useful indeed. Unfortunately, it is not possible to list all of them in this limited space. I am grateful to all my family member.

## ABSTRACT

Delays in construction projects have become a common global phenomenon, due to the complex nature of the industry. Iraq is one of the developing countries which faces delay problem in time of urgent need to develop and rebuild the destroyed infrastructure caused by successive wars. The aim of this study is outline the strategy of minimizing delays through implementation of electronic-procurement system in public construction projects. There are three objectives to achieve this aim. First, determining the relation of procurement systems used with the delay factors. Second, determining the contribution of e-procurement systems in minimizing delays. Third, suggesting an appropriate strategy to assist in carrying out an effective e-procurement system for public construction projects. These objectives were achieved through an intensive literature review and a survey which included a questionnaire used to assess the perceptions of the main participants involved in the construction projects. Interviews conducted with experts to validate the questionnaire form before distributing. The questionnaire was divided into three sections. The main section focused on the causes of delay, which related to procurement system. The 34 causes compiled through the literature review and the interview with experts were classified into four groups according to phase related. Answers collected from 53 respondents representing the parties involved in the construction projects. Data collected was analysed quantitatively and ranked through the Statistical Package for the Social Sciences (SPSS) to identify the significant effects of the procurement system on the delay. It was concluded that the most effective delay factors related to procurement system in Iraq are: the administrative bureaucracy, appointing inexperienced contractors and Incompetent design team, Inadequate early planning, absence of transparency, and limited competition. Finally, appropriate strategic steps identified to carry out an effective e-procurement system in public construction projects.

## ABSTRAK

kelewatan dalam projek pembinaan telah menjadi satu fenomena global yang kerap berlaku, kerana sifat kompleks industri. Iraq adalah salah satu daripada negara membangun yang menghadapi masalah penangguhan untuk membangun dan membina semula infrastruktur yang hancur disebabkan oleh peperangan berterusan. Tujuan kajian ini adalah untuk menggariskan strategi meminimumkan penangguhan melalui pelaksanaan sistem perolehan elektronik dalam projek pembinaan awam. Terdapat tiga matlamat untuk mencapai kajian ini. Pertama, menentukan hubungan sistem perolehan yang digunakan dengan faktor kelewatan. Kedua, menentukan sumbangan sistem e-perolehan dalam mengurangkan kelewatan. Ketiga, mencadangkan strategi yang sesuai untuk membantu dalam melaksanakan sistem e-perolehan yang efektif untuk projek pembinaan awam. Objektif ini dicapai melalui kajian literatur yang intensif dan tinjauan yang merangkumi soal selidik yang digunakan untuk menilai persepsi para peserta utama yang terlibat dalam projek pembinaan. Temubual yang dijalankan dengan pakar untuk mengesahkan borang soal selidik sebelum dipdarkan. Soal selidik dibahagikan kepada tiga bahagian. Bahagian utama memberi tumpuan kepada sebab-sebab penangguhan, yang berkaitan dengan sistem perolehan. Terdapat 34 penyebab yang disusun melalui kajian literatur dan wawancara dengan pakar telah dikelaskan kepada empat kumpulan mengikut fasa yang berkaitan. Data yang dikumpulkan daripada 53 responden mewakili pihak terlibat dalam projek pembinaan. Data yang dikumpulkan dianalisis secara kuantitatif dan disusun melalui the Statistical Package for the Social Sciences (SPSS) untuk mengenal pasti kesan penting sistem perolehan terhadap kelewatan. Dapat dirumuskan bahawa faktor kelewatan yang paling berkesan yang berkaitan dengan sistem perolehan di Iraq adalah: birokrasi pentadbiran, melantik kontraktor yang tidak berpengalaman dan pasukan reka bentuk yang tidak cekap, perancangan awal yang tidak mencukupi, ketiadaan ketelusan, dan persaingan yang terhad. Akhir sekali, langkah strategik yang sesuai telah dikenalpash iailu sistem e-perolehan yang berkesan dalam projek pembinaan awam.

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## LIST OF ABBREVIATIONS

e-Procurement	Electronic Procurement
e-GP	Electronic Government Procurement
e-Government	Electronic Government
EDI	Electronic Data Exchange
ICT	Information Communication Technology
IT	Information Technology
MoP	Ministry of Planning
MoT	Ministry of Trade
MoF	Ministry of Finance
FBSA	Federal Board of Supreme Audit

## LIST OF SAMPLES

$\Sigma$	-	Summation
W	-	Weight given to each factor by the respondents
A	-	Highest weight (i.e. 5 in this study).
N	-	Total Number of respondents.
Std.	-	Standard of deviation
m.	-	Mean
RII	-	Relative Importance Index

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# CHAPTER 1

## INTRODUCTION

### 1.1. Problem Background.

The construction industry is a vital factor to the nations' development. The infrastructure such as bridges, highway, rapid transit system, building, residential and industrial constructions, dam and tunnels for irrigation and hydroelectric power contributes substantially to the economic growth of countries. Therefore, construction projects considered one of the major means for any government to develop and improve the infrastructure services, which reflect the level of development, and certainly when it is being delayed, will be an obstacle to the path of development.

Thus, Completing and operating or utilizing the construction projects according to the strategic and action plans of a government may reflect the seriousness and credibility of a government to fulfil promises made to citizens regarding improving the services. Thus, usually the governments are required to use the best tools and ways to ensure the implementation of construction projects in accordance with the plans set for them. One of these tools can be the procurement system adopted by government entities.

Unfortunately, the delay problem of completion construction projects beyond the planned time became a common global phenomenon in the construction industry, whether in the developed or developing countries (Choong Kog, 2018), due to the complex nature of this industry with a wide adventures domain of forecasting and expectations. A very fragmented industry with many inconsistent parties involved such as owner, consultant, contractor, subcontractors, supplier, stakeholders and customers, with incongruent goals and objectives between them which may have an unfavourable influence on the construction project implementation.

Furthermore, there are many definitions for delay in construction projects had been given by researchers in previous studies, in instance, (Assaf & Al-Hejji, 2006) defined delay as the time after the date that parties agreed upon for delivery of the project which is specified in a contract. Delay can be defined as the extension time required to perform the tasks under a contract (Stumpf, 2000). However, there are many problems or factors could be considered as a root which causes delays in construction projects, with certain interrelations among them. (Long, Ogunlana, Quang, & Lam, 2004).

Completing and operating or utilizing the construction projects according to the strategic and action plans of a government may reflect the seriousness and credibility of a government to fulfil promises made to citizens. Thus, usually the governments are required to use the best tools and ways to ensure the implementation of construction projects in accordance with the plans set for them. One of these tools can be the procurement system adopted by government entities.

Procurement is all the processes needed to be achieved to gain works, services or goods from an external source. (Tirole & Laffont, 1993) . It is used to ensure the client receives works at possible of the lower price, higher quality, and shortest time. (Van Weele, 2009) . Usually Public or government entities define the rules intended to ensure fair and open competition for their business, and minimizing the risks of fraud and collusion, and the e-procurement can provide these abilities.

Procurement process starting from the identification requirement to the end of its life. It includes pre-contract activities, post contract activities, and contract management. Procurement generally relates to goods, works and service(s) requirements'.(Van Weele, 2009)

This study highlights the implementation of electronic procurement system as a tool to minimize delay in public construction projects. Public e-procurement is a procurement use internet and technology facilities to required processes, it is assist in cut across departmental boundaries and involved a range of departments and agencies such as finance, procurement administration, and IT to work jointly. (Hardy &

Williams, 2008). As the construction industry become more complex, it is expected that there will an increase in the use of e-procurement in the future. (Ashworth & Perera, 2018)

## **1.2 Problem Statement**

The construction industry plays major role in the nation development. Nowadays, the economic growth of the nation determined and measured by physical infrastructure such as buildings, roads, bridges, ports, harbours, terminals, highways, rapid transit system, telecommunications, dam and tunnels for irrigations and hydro-electric power, waste disposal and treatments, public housing and industrial buildings.

Unfortunately, delays in construction projects becomes a common global phenomenon, whether in developed or developing countries, with a disparity attributed to the systems used in construction industry. However, Iraq is one of the developing countries which faces delays problem in construction projects in time of urgent need to develop and rebuild the destroyed infrastructure caused by successive wars. According to the annual report of Iraqi federal board of supreme audit, of 2018 issued in May 2019 (FBSA, 2019), which clearly indicates to the big issues of delays in construction projects due to various reasons, the most important of which related to the procurement processes.

There are many definitions for delays in construction projects has been given in the previous studies, but, most of these definitions for delays had been reflected the one perspective which built on an aspect of contractual relations between the clients (owners) and the contractors according to the contract obligations. While, the importance aspect has been omitted, which represented by procurement processes and the time taken by the client (owner) to complete all the necessary procedures required to reach the stage of appointing the contractor and signing the contract, which is usually a considerable period may take months or even years. Especially if the client was the government and the traditional methods and bureaucracy with complicated routine was followed. (Bekr, 2015). Even though, it's mostly leads to select an

unqualified contractor, which is consider one from significant factors causes delay in construction projects in Iraq.(Mohammed & Jasim, 2018).

Therefore, any excessive time, which exceeding the reasonable time to complete this task must be taken in consideration to determining the overall delay during life cycle of public construction projects. In addition to that should be taken in consideration the essential role of procurement system during pre-construction and pre-contracting stage as well as managing the contract during the construction and utilization stages, to determine how the effective procurement system can assist in controlling or prevention many delay factors from effect the work processes in construction projects. Figure 1.1 illustrates the role of Procurement system during life cycle of construction project.

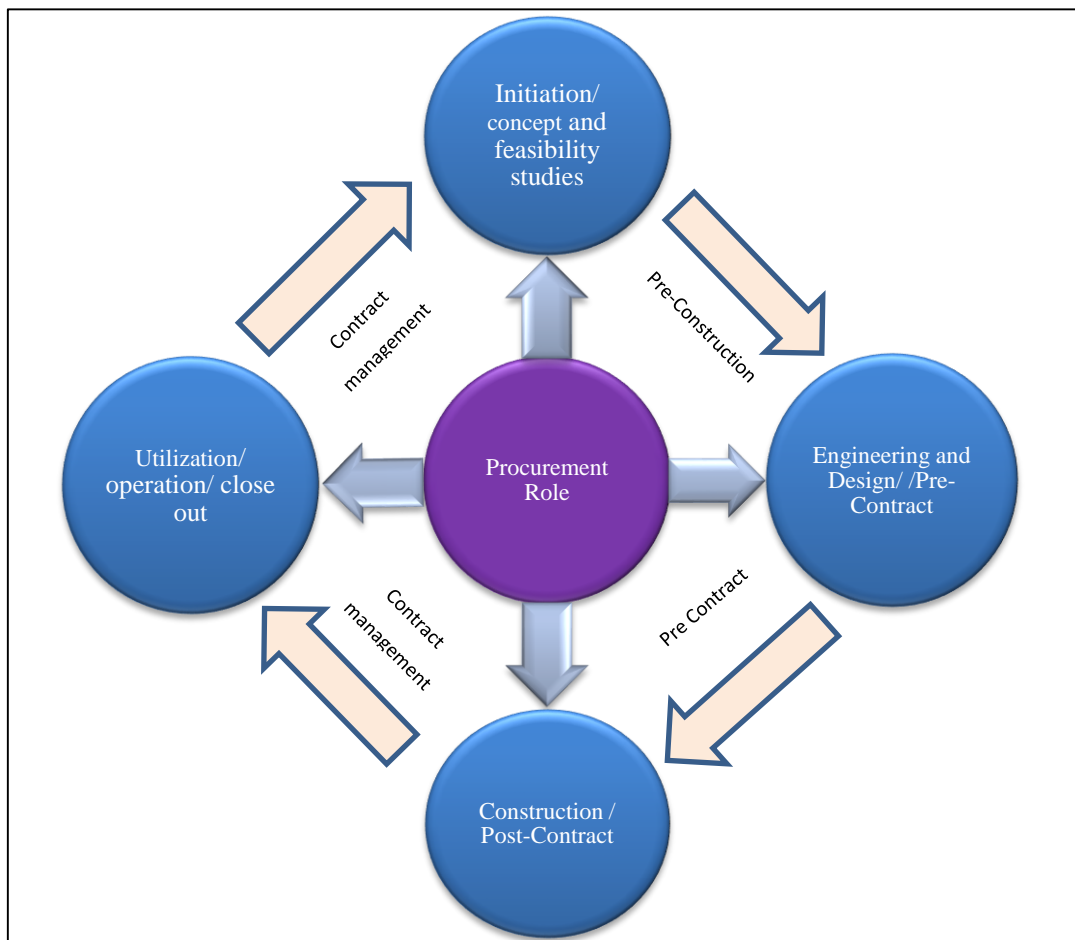


Figure. 1.1 Role of procurement system among Construction Project life cycle



Procurement system is the most important factor in the construction projects. Therefore, the understanding of procurement process is very much important. Although, most construction projects suffered from delays causes by lack of procurement system. Very rare people focus on this subject. Study in this area is very limited. Therefore, there is a need for this study to determine the effects of procurement system on the delays in construction projects, and the influence of implementation electronic-procurement system to minimize delays in near future.

### **1.3. The Aim and Objectives.**

This research aims to study the possibility of minimizing delay problems which interrelated to procurement processes through implementing of e-procurement in public construction projects. The effect of procurement systems on delays in public construction projects is a subject which is seldom discussed. Most people those involve with construction focus on project implementation progress and noticeable causes of delays during construction phase, without considering enough to contribution of procurement systems adopted. Although there have been many studies about the delays in construction projects, there were no studies directly tackle the issues of procurement systems contribution in causing the delay in public construction projects.

However, the suggested strategy in this study is built on three essential subjects; first, minimizing delays in the required processes during the initiation phase. Second, adopt an effective, fair, and a transparent electronic system for advertising, bidding, analysis, and criteria of selection, in addition to allow foreign companies to compete with local firms. Third, monitor the status and activities of the contractor outside of the project, which are may affect its activity in a project.

To achieve the aim of this study there are three objectives should be achieved as follows:

- (a) Determining the relation of procurement systems used on the construction project with the root factors of delays.

- (b) Determining the contribution of e-procurement systems in minimizing delay in construction projects.
- (c) Suggesting appropriate strategy to assist in carrying out an effective e-procurement system for public construction projects.

#### **1.4. Scope of the Study.**

This study focused on the public construction projects, which are either federal funded or province funded, and include, under the instruction No.2 for 2014 of Ministry of planning. (MoP, 2014)

The research will be focused on the following matter:

- (a) The area of study is limited to public construction projects in Iraq, which include, under the instruction No.2 for 2014 of Ministry of planning MoP.
- (b) The study is limited to traditional project delivery system only.
- (c) The projects researched are either federal funded or province funded
- (d) Information and data would be gathered based on the literature review and empirical studies.

The main purpose of this research is to determine the deficits in procurement system that causes delays problem in public construction project, and determine the role of e-procurement system in providing remedies for these deficits to avoiding delays problem. Comprehensive literature review, research and inclusive perception of the topic will be used for the research.

The research topic is relevant especially to those who really involved in the construction industry and procurement management. The research will be the data collection through questionnaire, and interview. Results and data collect from the research will be analysed with appropriate methods. The findings from the research will be used to recommend the processes or strategy to minimize delay in public construction projects.

### **1.5. Significant of Study**

The study is expected to bring valuable benefits and significance of establishing the concerned issues related to the role of e-procurement system in minimising delays in public construction projects. It will create a better understanding for the delays and the effect of procurement systems used on the construction project delays through its relationship with the root factors causes delays. That will help to find the remedies and suggest set of processes to assist in carrying out an effective e-procurement system for public construction projects.

The delay problem in construction projects in Iraq is incredibly noticeable. and It has considerable negative impact on the implementation of Iraqi development Plans (Bekr, 2015). Therefore, this study try to understand the effect of procurement system on the project performance in evaluating its relations degree of project completion. This assessment is valuable to decisions makers because it becomes a basis for adopting electronic systems assist in avoiding and mitigating the obstruction of the development plans caused by delay problems.

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