ANALYSIS OF FACTORS AFFECTING THE ACCURACY OF EARLY COST ESTIMATE IN CONSTRUCTION PROJECTS

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DEDICATION

"To my beloved wife, brother, sister, mother, and late father"

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ABSTRACT

Quality early cost estimate can be measured from its level of accuracy. Early cost estimates prepared at the early stage of project inceptions, therefore early cost estimates have an important function as a starting point and a benchmark for project planning and controling in the future project stages. Early cost estimates are prepared based on limited information and supporting data, it couses in early cost estimates has the lowest level of accuracy than any other types of cost estimates.

From the perspective of the important function of an early cost estimate, in contrary the low level of accuracy that is produced is a condition of stark contrast. This condition is often encountered during the preparation of early cost estimates of construction projects that why this topic became the basis of this research. This research aims to make an analysis of the relationship factors that affect the accuracy of the early cost estimate. Research data obtained from surveys of construction projects that have been completed in the period 2006-2011. Survey data were analyzed quantitatively to obtain significant variables and formulate a regression model of factors affecting the accuracy of early cost estimates.

Quality of cost estimates associated with the accuracy and completeness of the supporting elements depends on: nature of the project, the level of data and information available, techniques and methods used, ability of estimator, and other factor considered while preparing the estimate. The the factors were developed into 54 variables as the basic elements of the preparation of early cost estimates. From the results of multiple linear regression analysis obtained significant factors (<0.05) which affects the level of accuracy of the early cost estimates, as follows.: Geographical location / Site location, Quality level of the estimator / Estimator Expertise; Availability project information / Documents used in Preparing the estimate; the availability of scope of the project; the availability of project documents (preliminary and Size of Project / Scope of the project.

ABSTRAK

Kualiti anggaran kos pendahuluan boleh diukur dari tingkat ketepatan yang dihasilkan. Anggaran kos pendahuluan disusun pada peringkat awal projek bermula, sehingga anggaran kos pendahuluan mempunyai fungsi penting sebagai titik tolak dan tolak ukur perancangan dan pengurusan projek pada tahap-tahap berikutnya. Anggaran kos pendahuluan umumnya disusun mengikut maklumat dan data pendukung yang masih terbatas, hal tersebut menyebabkan anggaran kos pendahuluan mempunyai tahap ketepatan yang terendah berbanding jenis anggaran kos lain.

Dilihat dari fungsi penting suatu anggaran kos pendahuluan di satu sisi, dan di sisi lain rendahnya tahap ketepatan yang dihasilkan merupakan suatu keadaan yang sangat kontras bertolakbelakang. Keadaan tersebut sering dijumpai pada saat penyusunan anggaran kos pendahuluan projek pembinaan sehingga menjadi dasar dilakukannya kajian ini. Kajian ini bertujuan untuk membuat analisis mengenai hubungan faktor-faktor yang mempengaruhi ketepatan anggaran kos pendahuluan terhadap ketepatan yang dihasilkan. Data penelitian didapati daripada kajian terhadap projek-projek pembinaan bangunan yang telah selesai pada kurun waktu tahun 2006-2011. Data hasil kajian dianalisis secara kuantitatif untuk mendapatkan variabel signifikan dan merumuskan model regresi terhadap faktor-faktor yang mempengaruhi ketepatan anggaran kos pendahuluan.

Kualiti anggaran kos yang berkaitan dengan ketepatan dan kelengkapan unsur-unsur pendukungnya bergantung pada: sifat projek, ketersediaan data dan maklumat, teknik dan kaedah yang digunakan, kualiti dan pengalaman estimator, serta faktor lain yang dipertimbangkan saat menyiapkan anggaran kos. Dari faktor-faktor tersebut dikembangkan menjadi 54 variabel sebagai unsur-unsur dasar penyusunan anggaran kos pendahuluan. Dari hasil analisis regresi linier berganda didapati 4 faktor bermakna (<0.05) yang berpengaruh terhadap ketepatan anggaran kos pendahuluan, iaitu: lokasi projek, kualiti / pengalaman penganggar, ketersediaan data dan maklumat projek, dan lingkup projek.

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CHAPTER 1

INTRODUCTION

1.1 Background of the studies

Nowadays the construction sector in Indonesia is experiencing rapid growth. The development of these construction projects marked by numerous large-scale construction projects built by government or private parties.

A project has essentially been born from a decision to invest. The decision to make an investment involves a number of funds in hopes to get the benefits that often will have a major impact for the survival of a company. One of the decisions that must be taken to initiate an investment project is to determine what will be built and how much does it cost to build the project. Physical development costs and other expenses are fixed capital for building construction projects.

Cost estimate according to *the National Estimating Society-USA* is the art of estimating (the art of approximating) the possibility of total costs required for an activity of which is based on information available at that time. Based on the function and its relationship to the level of accuracy, there are several types of cost estimates in each stage of the project. For example in the early stages of project concept development, note the estimated how much it cost to build a project, therefore, developed a preliminary cost estimate. Preliminary cost estimate is one important factor that should be considered in decisions to invest in development projects because of the value that result from a process of preparing the preliminary cost estimate is the approximate amount of initial capital needed for the project owner.

Evaluation of the feasibility of building projects, and decisions on design and construction issues are usually based on a series of approximate estimates (pre-bid forecasts) that are considered against initial plans and budgets (Betts and Gunner, 1993). Approximate estimates are also required for funding decisions and cost control. Over-estimation or over-provision of funds for one project means lesser funds are available for other business opportunities. In difficult times, estimations of profit margins are likely to be conservative and construction costs are over-estimated, otherwise viable projects may be shelved. Estimates form the basis for tender comparison or negotiation, and under-estimation may lead to difficulty in award decisions, or in some cases unrealistic negotiation targets. Projects may be delayed whilst more funding is arranged or even shelved if additional funds are not available. To proceed with insufficient funds will likely lead to payment problems and hefty finance costs for overdrafts or emergency loans during construction. It is therefore necessary for quantity surveyors (QS) to improve the accuracy of their estimates to ensure that clients are satisfied with their services.

Accurate, early cost estimates for engineering and construction projects are extremely important to the sponsoring organization and the project team. For the sponsoring organization, early cost estimates are vital for business unit decisions that include strategies for asset development, potential project screening, and resource commitment for further project development. Inaccurate early estimates can lead to lost opportunities, wasted development effort, and lower than expected returns.

For the project team, performance and overall project success are often measured by how well the actual cost compares to the early cost estimate. Initial cost estimates are the basis on which all future estimates are compared. Future estimates are often expected to agree with (i.e., be equal to or less than) the initial estimates. However, final cost often exceeds the initial estimate.

Estimated project cost is generally a systematic steps and through the same process between one project and previous projects of its kind. Various literatures provide guidance on the process in calculating the project cost estimates using various methods and approaches used. The availability of data and information, time limit, techniques and methods used, skills and abilities an estimator is a factor that determine the quality of the project cost estimate.

Another factor affecting the quality of the project cost estimate is uncertainty which is one of the unique characteristics of a construction project. Limitations of data and information in the development stage preliminary cost estimate is one source of uncertainty containing the risk that causes low levels of accuracy. Risk is an unavoidable problem of every construction project. Therefore it is necessary to planning and managing the risk integratedly in every stage of the project, including in the development stage preliminary cost estimate project.

1.2 Problem statement

Early cost estimate is a type of cost estimates in the earliest stage of construction projects. With a high degree of uncertainty (see **figure 1.1**) because of the limited information available to cause the accuracy of cost estimates has the lowest degree of accuracy than any other cost estimates. But on the other hand the value of projects resulting from the calculation of the preliminary cost estimate is critical to the continuation phase of your next project. That amount will be used as a basis for decision making project implementation and will be used as a reference estimate of the cost at a later stage.

Because of the importance of preliminary cost estimation, as a starting point for the commencement of the project and as a basic reference for the next stage, then the accuracy of the preliminary cost estimate is an important thing that should be considered in the process of preparing the preliminary cost estimates.

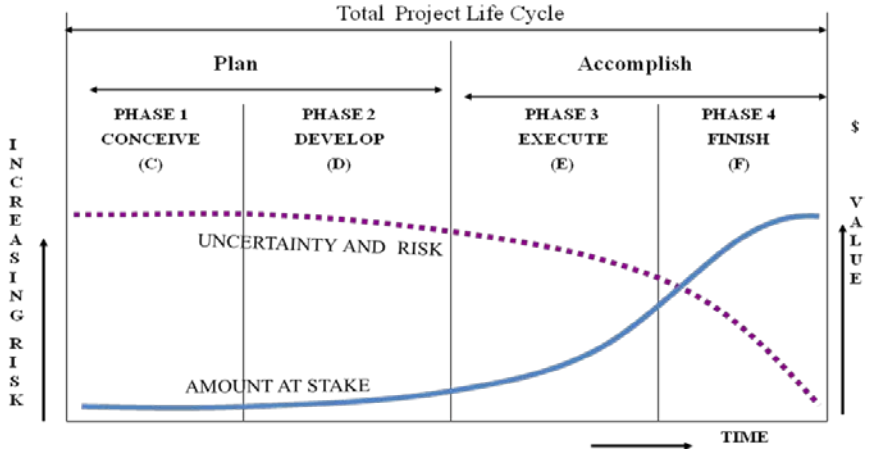

Figure 1.1 Typical life cycle profile (Risk Versus Amount At Stake)
(Source : Budi Manan, 2007)

1.3 Objective of the research

The objectives to be achieved in this study are:

a. Identifying factors that affect the accuracy of early cost estimates of construction projects.
b. Identifying relationship between the factor and the accuracy of early cost estimates.

1.4 Scope of the research

Scope of the research are:

a. Early cost estimates that has been mention in this research is initial cost estimates on construction projects in Jakarta, Indonesia.
b. Types of projects to be taken as a sample are building construction project
c. The process of preparing the preliminary cost estimates made during the feasibility study lasted until just before the detailed design is completed.

1.5 Important of the research

In general, the author hopes this research can contribute to the development of construction industry in Indonesia, especially in the sector of Construction Management. The important of the research are:

a. Providing an explanation of how the availability of data and information, methods and systems used and the experience and skills related to the process estimator estimates the cost could affect the accuracy of preliminary cost estimates.

b. Provide input in the application process preliminary cost estimates associated with the things that need to be prepared, techniques and

methods used, the necessary procedures and other matters involved in the process preliminary cost estimate in order to produce a preliminary cost estimate is accurate.

1.6 Organization of Thesis

This thesis consists of five chapters, among others:

Chapter I Introduction

In this chapter explained the background of this study, formulation of problem statement , objective of the research, scope of the research, importance of the research, research methodology and organization of thesis.

Chapter II Literature Review

In This section described the basic theory associated with the overall project cost estimates and preliminary cost estimates in particular. Sources literature drawn from several references in the form of books or journals that have published research.

Chapter III Research Methodology

This section describes the methods and procedures used in this research. Systematic research is illustrated by the flow chart that explains each step that passed from this research. The basis of the steps in quantitative research and data collection system described in this section.

Chapter IV Analysis and Discussion

Analysis of data obtained and the discussion until drawn a conclusion described in this section. Every step analysis used and the discussion related to the findings generated are described to obtain a clear picture of the results obtained from this research.

Chapter V Conclusion and Suggestion

This section contains the conclusions that can be drawn from the results of research undertaken. The suggestions that if can be used and further recommendations can be used in the development of subsequent research provided in this section.

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