COMPARISON FOR COMPONENTS OF COST OVERRUN IN CONSTRUCTION

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DEDICATION

Specially dedicated to my mother, Zhang Hui'e, my fathers, Liu Junfeng & Zhao Peitang, my siblings, Liu Hanfei, Zhao Yong & Zhao Tingting.

For your everlasting love and care…

From: Liu Linbo

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ABSTRACT

Construction industry is considered as one of the most important industries in China. It is well known that most construction projects in China are exposed to cost overrun. From the literature review, forty-three general cost overrun factors in construction projects were obtained based on previous researches from many countries. The aim of this study is to evaluate the most important cost overrun factors that are specifically related to resources, namely labour, material, equipment and subcontractor. Two questionnaire surveys were used to achieve the objectives in this study. The first questionnaire was designed to determine the severity of cost overrun factors, and the second one was designed to obtain the proportions of cost components and top-ten factors cost for each component. Data from the questionnaires were analysed by using the relative importance index (RII) method and mean value method. The findings indicated that material cost is the highest, and subcontractor cost is the lowest, while equipment and labour cost are approximately the same. Low productivity of labour, lack of skilled labour, escalation of material prices, material quality issues, high cost of machineries and poor cash flow management are among the important factors for cost overrun. This study concludes factors that cause cost overrun in China are similar to those that can be found in other countries except for a few factors. These factors are rework due to error in construction, equipment breakdown, improper planning, project management and contract administration, high level of quality requirement, and project schedule changes. This study can be used as reference for the further studies to evaluate the causes of cost overrun in construction projects and minimise the associated risk.

ABSTRAK

Industri pembinaan dianggap sebagai salah satu industri yang paling penting di Negara Cina. Adalah diketahui umum bahawa kebanyakan projek pembinaan yang di Negara Cina terdedah kepada lebihankos. Dari kajian literatur, empat puluh tiga faktor lebihan kosumum dalam projek pembinaan telah diperolehi berdasarkan kajian terdahulu dari beberapa negara. Tujuan kajian ini adalah untuk menilai faktor lebihan kos yang paling penting yang khusus berkaitan dengan sumber, iaitu buruh, bahan, peralatan dan subkontraktor. Dua kajian soal selidik telah digunakan untuk mencapai objektif kajian ini. Soal selidik yang pertama telah direka untuk mendapatkan tahap faktor lebihan kos, dan yang kedua telah direka untuk mendapatkan nisbah komponen kos dan sepuluh faktor teratas bagi setiap komponen kos. Data daripada soal selidik dianalisis dengan menggunakan kaedah indeks kepentingan relative (RII) dan kaedah nilai min. Hasil kajian menunjuk kan bahawa kosbahan adalah yang tertinggi, dan kos subkontraktor adalah yang paling rendah, manakala kos peralatan dan buruh adalah lebih kurang sama. Produktiviti buruh yang rendah, kekurangan tenaga buruh mahir, peningkatan harga bahan, isu kualiti bahan, kos jentera yang tinggi, kelemahan pengurusan aliran tunai dan pengurusan kewangan adalah antara faktor penting lebihan kos. Kajian ini menyimpulkan faktor yang menyebabkan lebihan kos di Negara Cina adalah sama seperti yang boleh didapati di negara lain melainkan bagi beberapa faktor. Faktor tersebut ialah kerja semula kerana kesilapan dalam pembinaan, kerosakan peralatan, perancangan yang tidak betul, pengurusan projek dan pentadbiran kontrak, tahap keperluan kualiti yang tinggi, dan perubahan jadual projek. Kajian ini boleh dijadikan rujukan bagi kajian selanjutnya untuk menilai punca lebihan kos dalam projek pembinaan dan mengurangkan risiko yang berkaitan.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

This study is to investigate the factors that cause cost overrun in construction of China. In this chapter, introduction is made on the general information regarding to cost overrun in construction industry, problem statement, aim and objectives, scope and limitation of this study, briefing methodology, and summary of all chapters.

1.2 Background

Construction project is unique production because of its natural condition that is produced by the contractor within specified time, allocated budget and quality of work. With the development of construction industry, due to high requirement of public and private sectors, it is more difficult to achieve the objectives of project. In any projects, the elements of time, cost, and quality are important for all participants, namely client, consultant, contractor, subcontractor etc.

With the development of the national economy of China, construction industry plays an important role in the whole economy. Tse and Ganesan (1997) concluded that usually the growth of construction industry could drive the growth of the macro-economic and vice versa, through analyzing the relationship between GDP of Hong Kong in construction industry. Chui and Bai (2010) revealed that the construction industry is important to the growth of the national economy because it has an impact on nearly every aspect of the economy. However, with the development of construction industry, the project is becoming more complex and high requirement of client. Therefore, construction industry is facing much higher risk of cost overrun.

Improving construction cost efficiency had contributed to cost savings for a country (Najjar, J. M., 2008). Cost overrun exposes the construction industry to a bigger challenge because of tight monetary relationship with national economy. Cost management is important to avoid cost overrun and maximises benefits to the construction industry and the national economy. It is widely accepted that a project is successful if it is constructed within budget, completed on time, and in accordance with specifications and stakeholder requirements (Puspasari, 2006). Therefore, having a total project cost that is within the budget is one of the criteria of a successful project. Most companies have various strategies to manage construction cost, in order to reduce the risk of cost overrun.

In construction phase, budgeted cost is a major component of the project cost management and it reflects product value. Budgeted cost plays an important role for properly arranging basic construction plan, strengthening project cost management and exerting the best efficiency of construction funds. The main problems existing in the current project cost management are budget increase, cost increase, and cost growth. The problem of cost overrun, not only reducing the construction project investment returns, but also leading to the state of infrastructure investment is seriously out of control. Cost overrun has become a challenge in construction industry worldwide, because it is leading to various claims. Hence, improving cost management is important. In order to gain the project objective that cost within the

budget, the construction industry should adopt innovative management techniques, team building and value engineering (Najjar, J. M., 2008).

1.3 Problem Statement

It is widely accepted that a project is successful if it is within the budget, completed on time, in accordance with specifications and to stakeholder satisfaction (Puspasari, 2006). Therefore, having a total project cost that is within the budget is one of the criteria of a successful project. Most companies have various strategies to manage construction cost, in order to reduce the risk of cost overrun.

For the past several decades, because of size, complexity and high demand by client, construction project objectives of quality, cost and time are difficult to achieve. Previous studies showed that most projects were completed exceeding their stipulated budget (Memon, A. H. *et al.* 2011). Cost overrun may create significant financial risk to both contractors and owners. Although contractors are using guidelines for monitoring and controlling construction cost, they are still facing cost overrun problem, because contractors would use their profit to cover cost overburdens, but cost overburden can offset their profits easily. Therefore, it is very important to identify project cost overrun factors in order to manage and reduce its impact (Akinci *et al.* 1998).

This study will evaluate main factors that causing cost overrun, in order to find the solution of cost overrun problem and take proper actions to minimize the associated risks. Therefore, this research can be guidance for contractors to avoid the problem of cost overrun. The added academic contribution of this paper is presenting the significant differences among different components of cost in China.

1.4 Aim of Study

The aim of the study is to evaluate the relative important factors that cause components of cost overrun in construction industry of China.

1.5 Objectives of Study

i. To identify the general factors that can cause cost overrun in construction project.
ii. To identify the severity of factors that causes components of cost overrun in construction projects of china.
iii. To analyse significant differences among different cost components in construction industry of China.
iv. To evaluate the importance of the factors that cause cost overrun in construction projects of China.

1.6 Scope and Limitation of Study

Several considerations have been taken while carrying out this study. The data were collected only from experienced contractors in relevant construction projects. The types of projects include residential, industrial, and building construction. This study defined direct cost as labour, material, equipment, and subcontractor. Two sets of questionnaire surveys were designed for this study. They were distributed to 100 qualified respondents who are residing in Guiyang and Ningbo area in China.

1.7 Research Methodology

Through the initial study, it provides a good understanding about problem, objectives and scope of this study. Then, the next logical step is data collection. Data collection includes primary data collection and secondary data collection. Primary data collected from literature review and interview with professionals in construction industry. Questionnaire method was adopted in this study and the secondary data collected from the questionnaire survey. Secondary data can be analyzed by using some statistical tools, and result will be obtained from data analysis. Research methodology is briefly shown in Figure 1.1. All details were explained in chapter 3 (Research Methodology)

1.8. Significance of Study

Nowadays, due to much more complex and difficult of the project, contractors are facing unprecedented changes. The importance of the study is considered to determine the main factors that cause cost overrun, in order to improve the effectiveness of project. The significance of this study is as below:

i. The research is essential to recognize the problem faced by contractor.
ii. The identification of factors that cause cost overrun in construction enables appropriate allocation of limited resource. The relative importance index method of analysis is adopted to determine the severity of each cost overrun factor.
iii. The study optimistically can help contractors to control the construction project cost effectively.

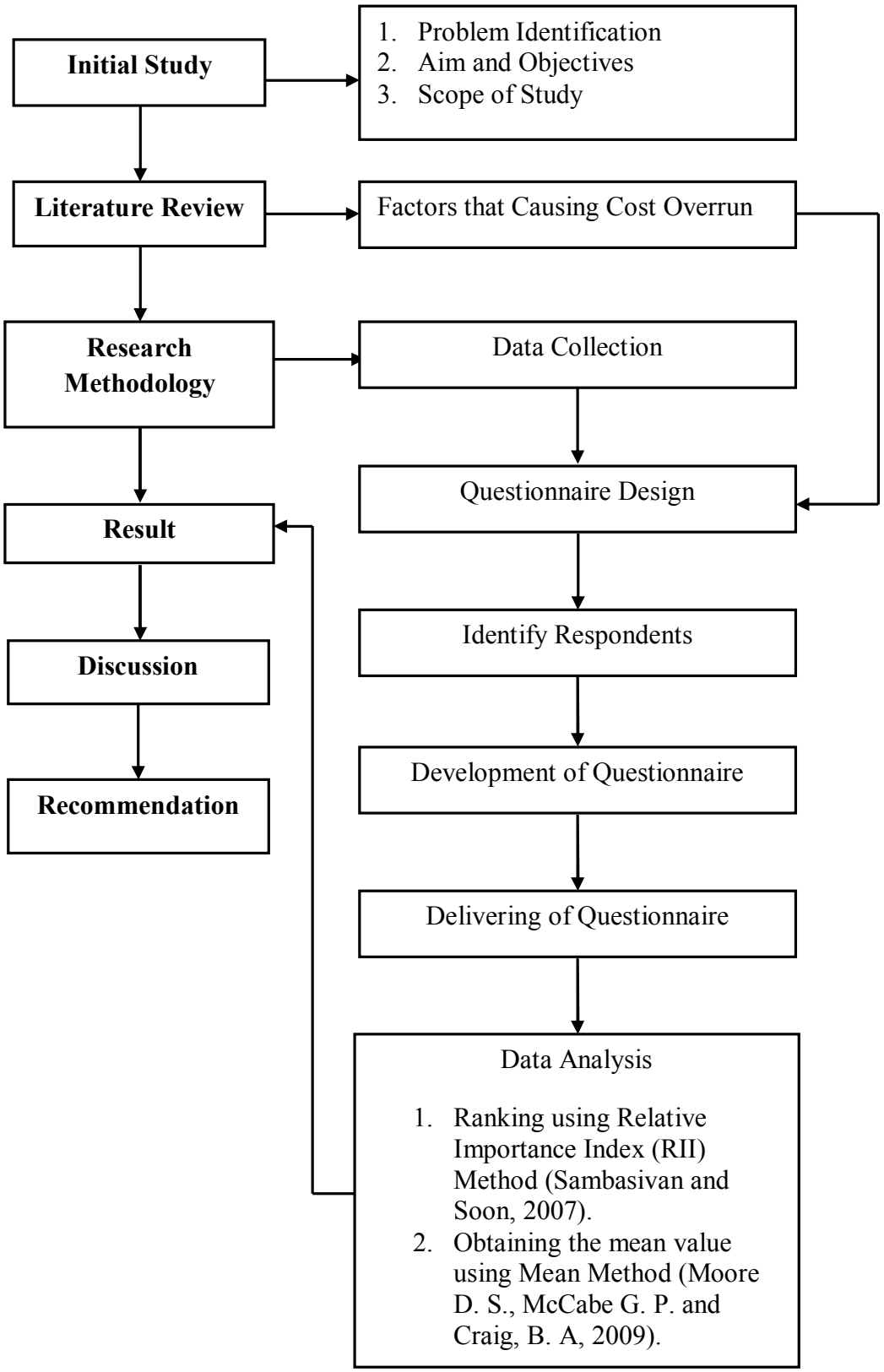

Figure 1.1: Brief research methodology

1.9 Summary of All Chapters

The summary of all chapters is to ensure the data is presented in the systematic manner. It is important to give more understanding about the aim and objectives of this study. The study is presented in five chapters.

Chapter 1 presents the introductory which is including background of study, problem statement, objectives, scope and methodology. This chapter is important because it provides the overall information about the study.

Chapter 2 reviews the literature data relating to general cost overrun factors; it is conducted to help achieve the objectives in this study.

Chapter 3 discusses study methodology, which describe the data collection method and analysis method.

Chapter 4 presents the data analysis result. It analyzes data that obtained from the questionnaire survey through specified mathematical method in the previous chapter. Based on the objectives, the results are discussed in the this chapter.

Chapter 5 is the conclusion of this study. Results and discussions from the data analysis are summarized. According to the summary, recommendation for future study also proposed at the end of the chapter.

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