MALAYSIA CONSTRUCTION EXPERIENCE IN DEPLOYMENT OF CRANE SERVICES FOR CONSTRUCTION PROJECT

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DEDICATION

Especially to my family and all my friends.

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ABSTRACT

Crane usage is one of the essentials machineries in building construction projects. The accuracy of crane selection will have some influence on the project profits. Crane plays a prominent role in construction building due to its importance in lifting, transporting and handling material. However in Malaysia, there are no specific guidelines in crane selection. Therefore this study was done with the aim to review the method used in crane selection process and subsequently, identifying the problems occur due to crane selection. The methodologies adopted include interview with expert panels, case study and questionnaire survey. From the study showed that three common types of crane generally found in building construction in Malaysia are tower crane, mobile crane and crawler crane. Normal practice in Malaysia's building construction for crane selection is based on criteria and category selection. Nonetheless, they can sometimes be very costly and thus, the right decision must be made in order to avoid any misfortunes in the long run. When hiring tower crane, selection must be done in early stage of project because the rental considered as long term cost of the company. It consume about 0.5% of project cost. Technical problems can be defined as obstruction or restriction occurred while operating a crane such as mechanical or electrical failure that may cause crane breakdown, crane overturning that may cause accident, short of power supply and many more. Non technical problems can be defined as any mistake in contractual issue that may create problem in crane's usage. It was discovered that non-payment (financial problem) to crane suppliers has become significant impact to crane's operation.

ABSTRAK

Kren merupakan elemen penting dalam bidang pembinaan di mana peranannya adalah untuk mengangkat, memindah dan mengendali bahan binaan. Di Malaysia, tidak terdapat panduan khusus dalam proses pemilihan kren. Oleh itu, tujuan utama perlaksanaan kajian ini adalah untuk mengkaji teknik yang digunakan dalam proses pemilihan kren dan sekaligus mengesan permasalahan yang. Kaedah kajian yang telah dijalankan adalah temubual dengan beberapa pakar, kajian kes dan juga maklum balas soalan kajian. Daripada kajian yang telah dijalankan, kren seperti kren menara, kren *mobile* dan kren *crawler* adalah tiga jenis kren yang biasanya ditemui di tapak bina. Di Malaysia, pemilihan kren adalah bergantung kepada kriteria tertentu. Pemilihan kren yang tepat dan bersesuaian dengan kerja adalah penting untuk mengelakkan kerugian kepada syarikat dan juga kemalangan di tapak bina. Bagi kren menara, pemilihan hendaklah dilakukan diperingkat awal projek kerana bayaran sewa adalah agak tinggi yang mana ia merupakan penyewaan jangka panjang syarikat. Lebih kurang 0.5% dari kos projek telah diperuntukkan untuk menyewa kren menara. Dua jenis masalah yang kerap berlaku di dalam pengguan kren adalah masalah teknikal dan masalah bukan teknikal. Masalah teknikal merupakan masalah yang berlaku ketika kren sedang bekerja seperti kegagalan mekanikal atau elektrik. Masalah bukan teknikal pula merupakan kesilapan yang berlaku semasa urusan kontrak yang menyebabkan masalah dalam penggunaan kren seperti masalah kesilapan pemilihan kren untuk dipadankan dengan sesuatu kerja. Masalah kewangan merupakan faktor penting yang memberi signifikan negatif terhadap produktiviti kren yang seterusnya akan menyebabkan kelewatan perjalanan projek binaan.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Crane can be defined as a lifting machine which has a hook that attached to cables suspended from usually a moveable supporting, and used when it comes to move heavy objects. Equipped with wire rope drum, wire ropes or chains, and sheaves, this lifting machine can be used to move objects by lifting, lowering and even moving them horizontally. Be it onshore or offshore, cranes play an important role in the construction industry as it makes the process of lifting possible. Crane uses one or more simple machines to create mechanical advantage thus moving loads beyond the normal capability of a human (BOMAC Altrac, 2005).

Cranes are commonly employed for the loading and unloading of freight in the transportation industry. In the construction field, it is used to move heavy materials whereas in manufacturing industry, cranes are imperative for the assembling of heavy equipment. In a project, material handling plays a major role in the delivery process and crane is one of the deciding factors in achieving a high quality of work and smooth delivery to the construction site. As construction industry grows, especially in skyscraper project, crane usage will be the utmost priority and it is impossible for any high-rise project to be completed without the help of cranes. Most accidents happen because of the ignorance of such system by the workers, usually due to lack of knowledge or because the absence of the system in total. That is why the Health and Safety legislation has stated that in any work situation, there must be a safe system work as its basic requirement (CIRIA, 2005). Therefore, competent personnel should be put into a good use at all times.

1.2 Problem statement

Cranes play the most vital roles in construction industry especially for civil work in tall buildings. Issues regarding crane's usage always occur either during selecting process or during the operation. There are many problems that can be categorized as technical such as mechanical failure, overturns, falls, instability that tend to cause unsecured load, and load capacity exceeded. Difficulties such as these may cause major crane accidents. As a result, it could possibly leads to a crane productivity slowdown. Apart from that, problem in procurement arrangement and contractual matter are categorized as non-technical. The unavailability of crane when required for certain task to ensure smooth runs could cause unwanted project delay. Safety element is the subset of technical indication and human negligence such as inadequate inspection and maintenance, no hand signals, unguarded parts and unguarded swing radius, can hinder the project.

Generally, several important requirements need to be considered when selecting a crane, which are application, environment, physical restriction, quality of the crane and long or short-term costs (BOMAC Altrac, 2005). Unfortunately, early studies found that some of contractors did not obey these requirements. Besides that, lack of software application for crane selection, especially in Malaysia construction's industry may cause inaccurate selection.

1.3 Aim and objective of study

The aim of this study is to review the techniques used in crane selection process and subsequently, detecting the problems occur in crane selection.

The objectives of this study are as follow:

a) To determine different type of crane used in building project.
b) To identify problems in crane usage for building project.
c) To determine crane selection technique in Malaysia construction site

1.4 Scope and limitation of the study

To conform to the time frame given, the study obviously has certain limitations. This study only focused on selection process of the crane and some consequences relating in building project in building project. However for some examples such as lifting method in civil offshore project for jetty (finger pier berth) located in Fujairah, Dubai had also been referred for comparison. Three case studies of building project have been incorporated in this study to enable information like the type of crane, problem encounter and selection's technique to be collected.

1.5 Brief methodology of the study

In general, research methodology consists of four main parts which are literature reviews, site observations, questionnaires and interviews with experts. Figure 1.1 illustrates the schematic of research methodology that has been implemented for this study.

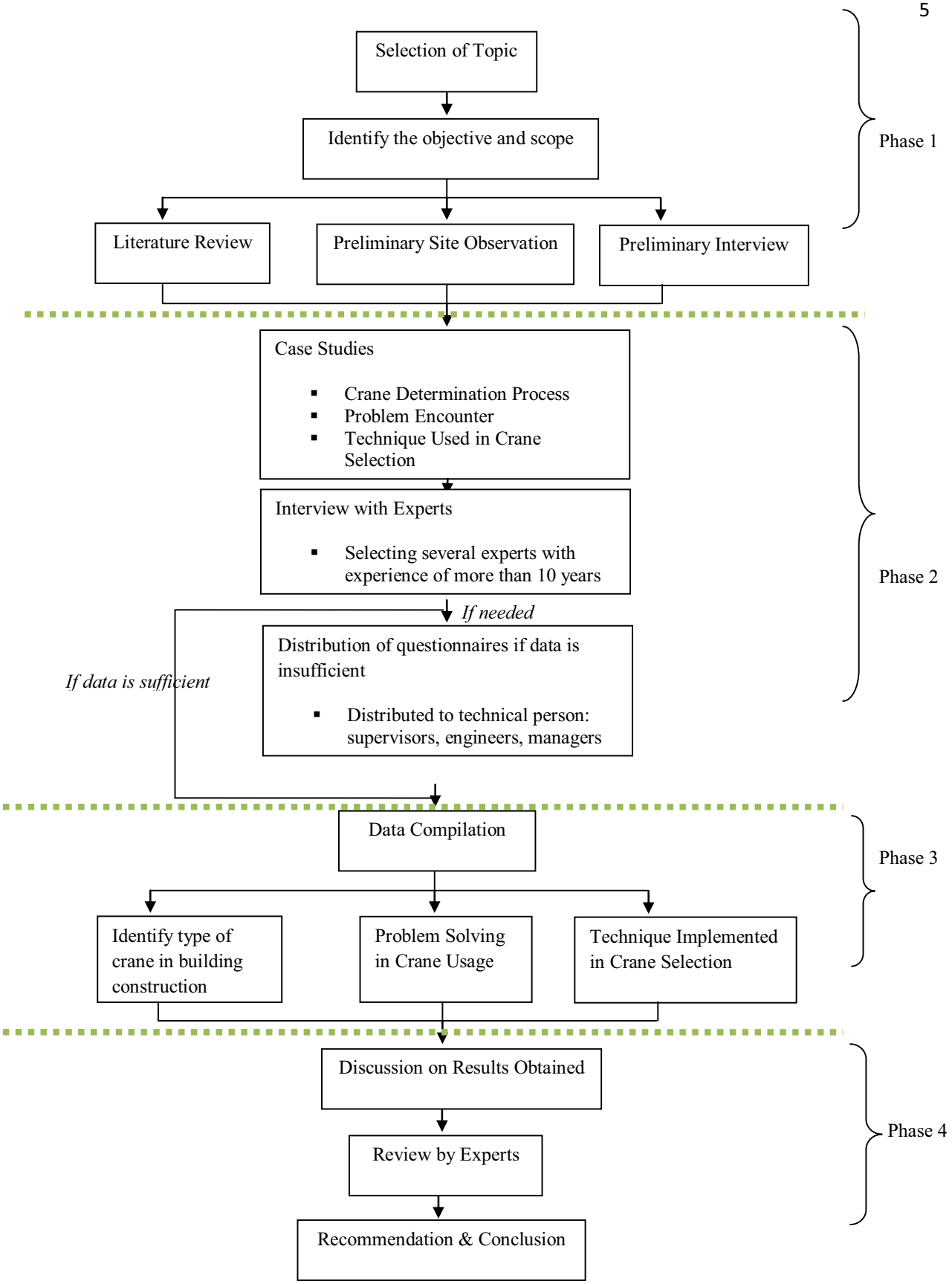

Figure 1.1: Research Methodology

1.6 Summary of the chapter

The study consists of seven (7) chapters to be completed and can be summarized as follows:

Chapter 1 describes the introduction of the study that includes problem statement, aim and objective of study, scope and limitation of the study, brief methodology of the study and summary of the chapters.

Chapter 2 describes the literature review on the crane in construction industry

Chapter 3 describes the literature review on the strategy in crane selection

Chapter 4 describes the methodology applied in the study which consists of literature reviews, site observations, questionnaires and interviews with experts.

Chapter 5 describes the data analysis and results obtained.

Chapter 6 describes the discussion of results.

Chapter 7 describes the conclusion and recommendations for the study.