THE IMPACT OF MULTILAYER SUBCONTRACTING PRACTICE ON PROJECT PERFORMANCE

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ABSTRACT

In construction industry, there is possibility for subcontractors to sublet their work to other subcontractors. It called multilayer subcontracting. Multilayer subcontracting has been identified as a source of poor time performance of projects in previous study. This study is about the impact of multilayer subcontracting system on project performance in Malaysian construction industry. The purpose of this paper is to study how multilayer subcontracting practice impacts the project time performance. It provides a perspective that multilayer subcontract could address the poor time performance caused by multilayer subcontracting. From previous study it shows that the multilayer subcontracting practice can be divided into five areas, which are communication, cost control, labour force, worker safety and productivity. This study expecting a positive relationship between multilayer subcontracting practices and project time performance. A method of survey questionnaire is being used in order to collect the data. The questionnaire distributed to contractor with "A" class registered with local authority, Pusat Khidmat Kontraktor (PKK). There are three sections in the questionnaire; Section A: Demography; Section B: Are they practice multilayer subcontracting; Section C; Their performance in time management. 84 respondents were targeted however only 52.38% gave feedback. The collected data was analysed using Statistical Package for the Social Science. This study found that there are only two areas that have positive relationship with the time performance namely worker safety and productivity. However it shows that the contractors actively practice multilayer subcontracting in the area of labour force.

ABSTRAK

Dalam industry pembinaan ada kemungkinan yang sub kontraktor itu akan menyewakan kerja itu kepada sub kontraktor yang lain. Ini dikenali sebagai subkontrak multi lapisan. Di dalam kajian-kajian yang lepas, "Multilayer subcontracting" dikenalpasti sebagai salah satu punca prestasi masa yang buruk dalam sesebuah projek. Kajian ini adalah mengenai kesan sistem subkontrak multi lapisan terhadap prestasi projek di dalam industry pembinaan di Malaysia. Tujuan penulisan ini adalah untuk mengenalpasti bagaimana subkontrak multi lapisan ini memberi kesan kepada prestasi masa sesebuah projek. Kajian ini dapat menunjukkan perspektif dimana masalah prestasi masa yang buruk disebabkan oleh subkontrak multi lapisan. Dari kajian lepas, boleh didapati bahawa subkontrak multi lapisan boleh dibahagi kepada lima bahagian, iaitu komunikasi, kawalan kos, tenaga buruh, keselamatan pekerja dan produktiviti. Kajian ini dijangka untuk menunjukkan hubungan yang positif di antara subkontrak multi lapisan dan prestasi masa projek. Data akan diperolehi melalui kaedah soal selidik. Soal selidik akan di agihkan kepada kontraktor kelas "A" berdaftar oleh badan berkuasa tempatan, Pusat Khidmat Kontraktor (PKK). Terdapat tiga bahagian di dalam soal selidik; Bahagian A: Demografi; Bahagian B: Adakah mereka mengamalkan subkontrak multilayer; Seksyen C: Prestasi mereka dalam pengurusan masa. 84 orang responden telah disasarkan bagaimanapun hanya 52.38 % memberikan maklum balas. Data yang diperolehi dianalisis dengan menggunakan Pakej Statistik untuk Sains Sosial. Dalam kajian ini menunjukkan bahawa hanya dua bahagian yang memberi impak positif kepada prestasi masa iaitu keselamatan pekerja dan produktiviti. Walaubagaimanapun, ada juga kontraktor yang aktif mengawalkan subkontrak multi lapisan di bahagian tenaga buruh.

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LIST OF ABBREVIATION

ASME	American Society of Mechanical Engineers
HVAC	heating ventilation air conditioning
MCGG	Malaysian-German Chamber of and Industry
PKK	Pusat Khidmat Kontraktor
SPSS	Statistical Package for the Social Science

CHAPTER 1

INTRODUCTION

1.0 INTRODUCTION

This paper investigates the impact of multilayer subcontracting practice on project performance in Malaysian construction industry. It focuses on the multilayer subcontracting system and how this system will impact the project performance. The element of this chapter would be the introduction, background of the study, problem statement, research objectives, research questions, scope and limitation of study, significance of study and the expected result.

1.1 BACKGROUND OF STUDY

In highly develop and up growing country, construction is one of the industries that contribute a lot in the country development. Ong (2012) indicates that construction industry is one of the major contributors to any economic development because it generates the

infrastructure required for socioeconomic development. Therefore the demand in construction industry increased. There are many ongoing projects in Malaysia today. The increase in numbers of project leads to demand of special expertise, advance equipment, and huge investment cost. In order to accommodate the high number of demands the main contractor will sublet the works by awarding it to subcontractors. Subcontracting is a norm in the construction industry today.

Subcontractor is a construction entity that is hired by a general contractor (main contractor) to carry out specific task from the total bulk of the General contractor's work. Meanwhile as stated in 'US Legal' (n.d) subcontracting is a practice of a contractor asking the subcontractor to perform some specific project tasks. Lew et al. (2012) defined "subcontractor as a construction firm that contracts with a general contractor to perform some aspect of general contractor's work". In spite of that, Kawasaki explained subcontracting is a contractual relationship in which large firm asks a small firm to conduct a commissioned work (producing parts, components, or finished products) under a dominant position (Kimura, 2001).

Additionally, it is more common than not that a subcontractor will further separate their work into small parts and segregate them to another subcontractor. This situation is called multilayer subcontracting. The system of multilayer subcontracting is widely adopted in the construction industry. In Malaysia, this system is usually present in mega projects where the demands of specialist works are high. The occurring of multilayer subcontracting practice has it owns reasons. Naturally, this system is used in projects because of least-cost approach; they believe that hiring subcontractors saves cost and easier. Another reason is for efficient organization of manpower to deal with variable and fragmented work demand (Yik & Lai, 2008).

However, the system has its downside and it has to be taken into further consideration. As the system has grown popular, some problems are expected to arise which could lead to project failure or poor project performance. Therefore, a study is conducted with regards to the multilayer subcontracting practice and its impact towards project management performance in Malaysian construction industry. By doing so, further understanding of the practice can be obtained.

1.2 PROBLEM STATEMENT

Sublet works by main contractors to other subcontractors has been part of the construction industry. Plus it is very typical scenario in construction. V.W.Y. Tam et al. (2011) said that it is impossible for a single main contractor to handle all related project task. The construction processes itself require different type of skills at different stages. However, there are several issues related to subcontracting rise within this sector. Rapid growth of infrastructure increases the demands in construction industry. Consequently, the resources are going to be limited. Hence the subcontractors will sublet their works to small subcontractors. In addition, this method will reduce the expenses and increase the income. Generally larger projects will involve additional layers in the subcontracting.

A study was conducted on the building construction sector of the US on the issues of subcontracting practice. As cited in Yik et al. (2006) Arditi and Chotibhongs state that, the issues that was identified includes the problems of payments by general contractors; tedious process of selecting subcontractors; subcontractor bonding; construction insurance; safety issues on construction site; partnering arrangements with various parties; and productivity issues (Arditi and Chotibhongs, 2005). Even though the study might not relate directly to multilayer subcontracting but the issues that were identified are certainly significant in the process of improving the performance of managing subcontracting in construction industry.

Figuratively speaking, multilayer subcontracting is actually the extent of subcontracting where subcontractors let out work to other subcontractors thus the word ‘multilayer’. As both this entities are interrelated, it is safe to say that any issues that from subcontracting will be found in multilayer subcontracting as well. However, this study will still be focused on multilayer subcontracting, and issues that arise from it. Any issues found from this research will be investigated and its consequences on project management will be thoroughly studied.

1.3 RESEARCH OBJECTIVE

The objective for this study is as following:

I. To study the impact of multilayer subcontracting practice on project performance.

1.4 RESEARCH QUESTIONS

The research questions for this study are as following:

I. Do Malaysia construction industry practice multilayer subcontracting?
II. Do the practices give impact to time performance of project?

1.5 SCOPE AND LIMITATION OF THE STUDY

This study focuses on Malaysian Construction industry which the main targeted respondent are from contractors registered with the local authority such as the “Pusat

Khidmat Kontraktor" (PKK). This study is focusing on the contractor's Bumiputera companies. Moreover, the respondents are among contractors that registered as a class 'A' in Kuantan area.

Apart from that, this study had considered several limitations. First limitation is due to the time constraint. The time provided to collect the data is limited. The time for collecting result should be longer so the scope could be broader. Due to the time constraint the population is limited to Kuantan area only. The second limitation is this study focus on the relationship between the impacts of multilayer subcontracting practice and project performance only. It does not cover how to avoid the impacts. The third limitation is the cooperation of the respondents in answering the questionnaires. All of these boundaries minimize the generalizability of findings. This study will not be generalizable to all areas of construction industry.

1.6 SIGNIFICANCE OF STUDY

This study focuses on the impact of multilayer subcontracting on project management performance which has caused some debate on the efficiency of this practice. Moreover, it contributes in giving understanding on the relationship between impact of multilayer subcontracting and the project performance. Apart from studying its relationship, the finding of the study can be used as a reference for the further studies in the future and also provide knowledge to the construction company.

1.7 THE EXPECTED RESULT

By the end of this research, it is forecasted that multilayer subcontracting system will give adverse effect on project performance. It is expected that the positive relationship between multilayer subcontracting practice and project performance in construction industry. This will be supported by showing multilayer subcontracting practice and how the impact of the practice can influence the project time performance.

1.8 SUMMARY

Generally, this chapter explained about what research is going to be conduct. It also explained about the main focus of the research. Besides that, it outlines the nature of the study, the scope, and the need of the research to be conduct.

CHAPTER 2

LITERATURE REVIEW

2.0 INTRODUCTION

It is important to review on the aspects that related to the subject of the study while conducting a research. In the previous chapter, the overview of this research was explained and the problems were identified. Through this chapter, the elaborations of the topic are clearly described. The clarification of the sub-topic will focused about the overview of construction industry, subcontracting in construction industry, problem of subcontracting, multilayer subcontracting, reasons for applying multilayer subcontracting, impact of multilayer subcontracting, project performance, relationship between impact of multilayer subcontracting and project performance, theoretical framework and hypotheses.

2.1 OVERVIEW OF CONSTRUCTION INDUSTRY

Construction Industry is one of the most booming industries in the whole world. According to business dictionary, construction industry is a sector of national economy engaged in preparation of land and construction, alteration, and repair of buildings, structures, and other real property. This industry is mainly an urban based one which is concerned with preparation as well as construction of real estate properties. The repairing of any existing building or making certain alterations in the same also comes under construction industry. According to Economywatch (2010) in general this industry can be categorized into three basic categories namely:-

I. Construction involving heavy and civil engineering
   -The construction of large projects such as bridge, road, etc comes under this category.

II. General construction
   -The construction works that involve building of real estate ones such as residential or commercial real estate assets, etc.

III. Construction projects involving specialty trades
   -Construction works that involve building up of specialized items namely, electric related works, works on woods, etc.

In another review, found that construction can be categorized into five major categories of work included, precisely, installation of fixtures and fittings such as plumbing, gas fitting, and electrical installation, general construction and demolition, civil engineering, building finishing like painting, glazing, plastering, and lastly construction and repair building.

In Malaysian construction industry, the areas were separated into two areas. First area is general construction, which comprises residential construction, non-residential construction and civil engineering construction. The second area is special trade works, which comprises activities of metal works, electrical works, plumbing, sewerage and sanitary works, refrigeration and air-conditioning works, painting works, carpentry, tiling and flooring works and glass works (MCGG, n.d). Both areas consist of several parties that linked to each other in delivery a project.

Typically, several parties that involved in construction are the project owner, the customer, the engineer, and the contractor (ASME, 1996). The project owner is an entity or organization that has a need to have a facility designed and constructed in order to carry out its objectives or duties. The owner recognizes the project scope, in terms of performance, and the timing and financial constraints. The owner must have a clear understanding of its customer's necessities and may require involvement of the customer in any engineering and construction activities which advance improving the necessities.

Meanwhile, the customers are usually key players in any construction project. Each individual, or party involved in a project, may have a different customer. As example, the owner may need to respond to the requirements of its Board of Directors, or it may be building a facility to sublet to another entity, who would then be its customer. As for the engineers and contractors involved, the owner is the customer. Subcontractors' customer on the other hand is the entity with whom they contract. Ultimately, the owner or the owner's customers are customers of all the parties involved in a project. Involvement of all parties in understanding the needs of the owner's customer is a crucial first step in establishing the project basis or scope.

The engineer, alternately referred to as the designer or architect/engineer (A/E), is an individual or organization that is able to assist the project owner to meet its needs by designing (developing and specifying in detail the scope, cost and timing of) the project. In addition to the actual design services (preparation of plans and specifications), the engineer might also assist the owner in determining its full needs, by activities such as procuring specialty items, providing construction bid documents and post-design completion services, and assisting the owner in starting up and operating the facility.

Nonetheless, contractors can vary in capability, depending on the complexity of the project. The contractor may be as small as a one-man carpentry service performing work in a local community or as large as an international organization employing tens of thousands of workers across the globe. The contractor will construct the facility as defined by the engineer, for an agreed upon price and duration, utilizing its own means and methods. Prior to contract award, it is essential that the design be comprehensive and that access to the construction site(s) be provided in a timely manner. Basic types of contractor organizations include:

I. General Contractor

This is an individual or organization that typically contracts with the project owner to construct the facility. The general contractor typically does not perform the design of the project. The general contractor generally performs the work with a combination of direct hiring of individual craft workers and the use of subcontractors. Often, the work is bid as a fixed price, and the general contractor is responsible for safely "delivering" the engineered scope at the specified price, within the time allotted. This is referred to as being "at risk," because the contractor assumes any financial burdens that might result from project delays or cost overruns In some instances, a reimbursable contracting method is used when the engineered scope is not sufficiently detailed.

II. Subcontractor

This is an individual or organization that typically contracts with a general contractor to perform a specified part of the work as shown below, the subcontractor may directly hire craft personnel to perform the work or use a sub/subcontractor.

III. Specialty Contractor

This is an individual or organization that provides specialized construction services, usually involving a regulatory license or technical specialty (i.e., removal of contaminated soils, lead or asbestos abatement, x-ray inspection, electrical, plumbing, mechanical - or heating, ventilation and air conditioning, HVAC, etc.). They may be contracted directly to the project owner (in which case they are referred to as a "prime" contractor) or as a subcontractor to a general contractor. In another section, a thorough elaboration on subcontracting practice in construction industry will be discussed.

2.2 SUBCONTRACTING IN CONSTRUCTION INDUSTRY

The nature of construction industry requires larger numbers of specialists working together. Most of time, workers are specialized in a unique aspect of construction processes, and it is quite rare that workers possess multi-skills across the whole project (Yik et al., 2006). Subcontractors that offer various equipment, materials, skilled workers and know-how directly carry out the project, while main contractors are responsible for managing these works to ensure the work could satisfy clients' requirements.

Main contractors adopted subcontracting because it could ease their financial and workload pressures, especially, when several projects operate simultaneously. In construction, subcontracting plays important role. According to Lin Lin (2011) report,

Crowley et al. claimed that in Australia about 95% of work was carried out by subcontractors and Loh and Ofori declared 60% to 70% work is subcontract in Singapore. The percentage showed a lot of subcontracting contribution in construction area. Besides that, the subcontracting allows subcontractors to focus on developing their unique skills which leads the work to be accomplished high-effectively (Reeves, 2002), and these repetitive works could impact learning curves in a positive way.

Though the construction industry has taking advantage from subcontracting systems, it does not mean that the system is free of problems (Reeves, 2002). The aim in next session is to analyse the problem of subcontracting in the construction industry.

2.3 PROBLEM OF SUBCONTRACTING

Problem in construction industry occur worldwide. Some of the problems are the factor of causing project termination or project failure. According to the research done by Proverb et al. (2000) in UK the construction industry is plagued with some severe problems, including shortage of skilled workers, a lack of investment in research and development, and low profitability as well as clients dissatisfied with the level of service provided and the end product quality (i.e. the constructed building). Meanwhile in Hong Kong the construction area having problem with non-payment and site safety (Chiang, 2009).

Same thing happen within Malaysian construction industry. In addition, problems arise with subcontract had been one of the important factor that cause delay in construction industry (Lew et al., 2012). Subcontracting practice in Malaysia was proven creating problems to the construction industry by several studies conducted previously. Sambasivan

and Soon (2007) claimed that there are many subcontractors working under the general contractors particularly for huge projects in Malaysia.

In another study done by Alaghbari et al. (2007), lack of subcontractor skills are found to be one of the contributors to contractor in causing delay in 78 construction projects studied in Malaysia. Other than causing delay, coordination problems with subcontractor were quoted as factors that affect the construction labour productivity of residential projects in Malaysia (Kadir et al., 2005).

Even though, causing delay to work progress, other areas are also discovered such as role of subcontractor as partner of general contractor, material supplier and safety performance in construction project. Subcontractors are deemed to be one of the risks involved in partnering project in Malaysian construction industry. It was also revealed that a subcontractor's safety performance on their past projects is an important aspect looked for in applying bids for new work by the general contractors in Malaysia. Additionally, subcontractors' role as the mediator between suppliers and main contractor are found to be essential in material supply chain of Malaysian construction industry.

Subcontractor failure has been recognized a part of the risk assigned to general contractor in construction contracts. This is supported by El-Sayegh (2008) which believed that hiring subcontractors have its risk and can lead to low quality, completion delay and unsafe practice. Another risk involved with subcontractor is the likelihood of them breaking the contract and have disagreement with the general contractor. Therefore, subcontracting has been in the list of important factors in delays of work in UAE and Malaysia.

Issues like payment, safety, bonding, bidding, insurance, productivity, and partnering issues, require to be investigated in subcontracting practices. Nonetheless the