PRODUCTIVITY OF RENDERING AND TILING WORKS FOR BUILDING PROJECTS SCHEDULING

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PRODUCTIVITY OF RENDERING AND TILING WORKS FOR BUILDING PROJECTS SCHEDULING

RESLI AZHA BIN MOHD ZAIN

A capstone project report submitted in partial fulfilment of the
Requirements for the award of the degree of
Master of Project Management

Faculty of Civil Engineering
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MAY 2011

I declare that this capstone project report entitled "*Productivity of Rendering and Tiling Works for Building Projects Scheduling*" is the result of my own research except as cited in the references. The project report has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

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Special dedication to my wife, my children (Kak Yong, Gegirl and Rayyan) and my mother for their everlasting support and encouragement to complete the course of study

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ABSTRACT

Productivity is one of the important elements in construction planning and scheduling. However, Jabatan Kerja Raya Malaysia (JKR) as an implementing agency for the construction of government's project is currently lacking in data with regard to productivity of the building's construction activities especially in the rendering and tiling works. The focus of the study was to identify factors that can influence productivity of rendering and tiling works, as well as to establish relationship between the influential factors and productivity. The study also includes developing metrics of productivity for rendering and tiling works. The scope of this study was limited to the productivity of rendering and tiling works for floor and wall finishes using homogenous tile and non-homogeneous tile for project implemented by JKR. Questionnaire surveys were distributed to the tiling contractors in the Federal Territories of Putrajaya and Kuala Lumpur, District of Petaling and District of Hulu Langat in Selangor. Feedbacks received from the Questionnaire Survey were analyzed using average index and Pearson's Correlation. The outcomes of this study established the list of factors that can influence the productivity of rendering and tiling works which includes project factors, design factors, materials factor, management factors, workers factors and inspection factors. The relationship between influential factor and productivity of rendering and tiling works; and metrics of productivity for rendering and tiling works were also established.

ABSTRAK

Produktiviti adalah merupakan antara elemen yang penting di dalam perancangan dan penjadualan kerja-kerja pembinaan.Walaubagaimana pun, Jabatan Kerja Raya Malaysia (JKR) sebagai agensi pelaksana bagi pembinaan projek-projek kerajaan kekurangan data produktiviti bagi aktiviti-aktiviti yang terlibat di dalam kerja-kerja pembinaan bangunan, terutama sekali bagi kerja-kerja lepaan lantai dan pemasangan jubin. Fokus kajian ini adalah bagi mengenalpasti faktor-faktor yang mempengaruhi produktiviti bagi kerja-kerja lepaan lantai dan pemasangan jubin, termasuk menentukan hubungkait diantara faktor-faktor yang menpengaruhi produktiviti serta produktiviti bagi kerja-kerja lepaan lantai dan pemasangan jubin. Kajian ini turut termasuk membangunan metrik bagi produktiviti kerja-kerja lepaan lantai dan pemasangan jubin. Walaubagaimana pun, skop kajian ini adalah terhad kepada produktiviti bagi kerja-kerja lepaan lantai dan pemasangan jubin di lantai dan dinding menggunakan '*homogeneous tile*' serta '*non-homogeneous tile*' untuk projek yang dilaksanakan oleh JKR. Borang Kajian Soal Selidik telah diedarkan kepada kontraktor-kontraktor pemasangan jubin di sekitar Wilayah Persekutuan Putrajaya dan Kuala Lumpur serta Daerah Petaling dan Hulu Langat di Selangor. Maklumbalas yang diterima daripada soal selidik telah dianalisa menggunakan indeks purata dan '*Pearson's Correlation'*. Hasil daripada kajian ini adalah senarai faktor-faktor yang mempengaruhi produktiviti bagi kerja-kerja lepaan lantai dan pemasangan jubin yang termasuk faktor projek, faktor rekabentuk, faktor bahan, faktor pengurusan, faktor pekerja dan faktor pemeriksaan; hubungkait diantara factor-faktor yang mempengaruhi produktiviti serta produktiviti bagi kerja-kerja lepaan lantai dan pemasangan jubin, serta; metrik produktiviti bagi kerja-kerja lepaan lantai dan pemasangan jubin.

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CHAPTER 1

INTRODUCTION

1.0 Introduction

Construction is one of the important industries to the growth of a developing country such as Malaysia. According to the Ninth Malaysia Plan 2006-2010 published by the Economic Planning Unit, Prime Minister Department, (2006), the Government of Malaysia has allocated development expenditure of RM 200 billion, an increase of RM 30 billion from the Eighth Malaysia Plan, for implementation of project under the respective ministries. Out of the total allocation, 44.9 percent will be distributed to development projects under the economic sector; 37.5 percent for the social sector; 10.6 percent for security and 6.9 percent for general administration.

As the technical arm for the Government of Malaysia, Jabatan Kerja Raya Malaysia (JKR) acts as the main implementing agency in carrying out the development projects throughout the country. JKR has been given responsibilities to implement thousand of projects under various ministries be implemented under the Ninth Malaysia Plan.

Managing construction projects always requires continuous monitoring of project performance and the updating and tracking on project schedule. This is to ensure the project can be completed on time, within the budgeted cost and with acceptable quality of works.

Project performance data and productivity data from the construction field is a key role in evaluating and predicting project performance in term of cost and schedule. According to Motwani et al. (1995), the productivity in construction has always been very difficult to measure and control. Even though, productivity in construction hard to measure, there is a need to use it for timely decisions and reduce the negative impacts on cost and schedule. Therefore, the integration of historical productivity data with the on-going performance data in construction field are required (Hwang and Liu, 2005).

1.1 Problem Statement

The Jabatan Kerja Raya Malaysia (JKR) has completed thousand of projects every year for various ministries in Malaysia. However, there is lack of data on the productivity of the construction activities involved, for reference in the implementation of future project.

The top management of the JKR has realised the importance of having a standard productivity for activities involved in the building construction. Therefore, JKR through one of its branch in the headquarters named as the Complex Projects Management Branch has initiated the study on the productivity. Several construction activities has been selected for the productivity study which includes earthworks, concreting works, roofing works, painting works and rendering and tiling works.

Floor rendering and tiling works is one of the important activities in the building construction. Therefore, the productivity of the rendering and tiling works is important to be established especially as reference in estimating the duration of time required for that activity in the planning and scheduling of JKR's project.

Thomas and Yiakoumis in 1987 has highlighted that there is demand from the construction industry to develop acceptable construction productivity. Tavakoli (1990) highlighted that the availability and the accessibilities to productivity database can provide many valuable benefits including:

(i) The determination of completion times required for future project;
(ii) The pre contract scheduling of activities and preliminary planning on future project;
(iii) The evaluation of contractors' schedules submitted for approval;
(iv) The evaluation of progress on projects under construction; and
(v) The negotiation process between contractual parties regarding claims, change orders and disputes.

Christopher (1985) outlined four important reasons why productivity should be measured :

(i) Measurement provides an information base for goal-setting and for monitoring of achievement performance;
(ii) Measurement can reveal problem areas that would not otherwise be seen;
(iii) People work for what counts. With productivity measures in the bottom line for all jobs and units, productivity will be one of the performance measures that count; and
(iv) Measures can be source for learning and for participation. Productivity improvement results from what all employees do. Developing and employing measures can provide a way for drawing and motivating all company human resources.

1.2 Aim and Objectives of Study

The aim of the study is to investigate the productivity of rendering and tiling works for building project scheduling. In order to achieve this aim, the following objectives are established:

(i) To identify factors that can influence the productivity of rendering and tiling works;

(ii) To establish relationship between influence factors and productivity of rendering and tiling works; and

(iii) To develop metrics of productivity for rendering and tiling works.

1.3 Scope of Study

The scope of study for the productivity of rendering and tiling works will be based on the building projects implemented by the Jabatan Kerja Raya Malaysia (JKR). The study on productivity of rendering and tiling works was limited to tiling works using homogeneous and non-homogeneous floor and wall tile. This is because of the wide use of this type of floor and wall finishes in the JKR's project.

There are many sizes of homogeneous and non-homogeneous floor and wall tiles in the market. For the purpose of this study, the sizes of tile that were in the market from several suppliers were gathered to determine the sizes of tile that can be used in the study.

The tiling contractors in Federal Territories of Putrajaya and Kuala Lumpur, District of Petaling and District of Hulu Langat in Selangor were chosen as the

respondent in the questionnaire survey. They were chosen because of their work experience and direct involvement in the rendering and tiling works.

1.4 Research Methodology

The research methodology for this study is as illustrated in Figure 1.1, which consisted of three (3) phases.

Phase 1 basically involves the determination of objective and scope of the study and the literature review. The literature review was carried out to understand the issues through extensive reading from previous studies and researches that related to the productivity of construction activities or specifically to rendering and tiling works. In this study, the information sources were gathered out from text based material such as journals, local proceeding papers and text books were used in this study.

The second phase of the study was focused on the collection of data. Data for rendering and tiling works for the projects that have been implemented by JKR were collected. Construction drawings, bill of quantities, site diary, work programme and project progress report were the example of data that have been collected from the respective JKR office especially in the JKR district office which involved in the supervision of the project.

A semi structured interview also was conducted to get information and opinion regarding the rendering and tiling works. The target group for the interview was the contractors and the JKR personnel involved in the supervision of rendering and tiling works.

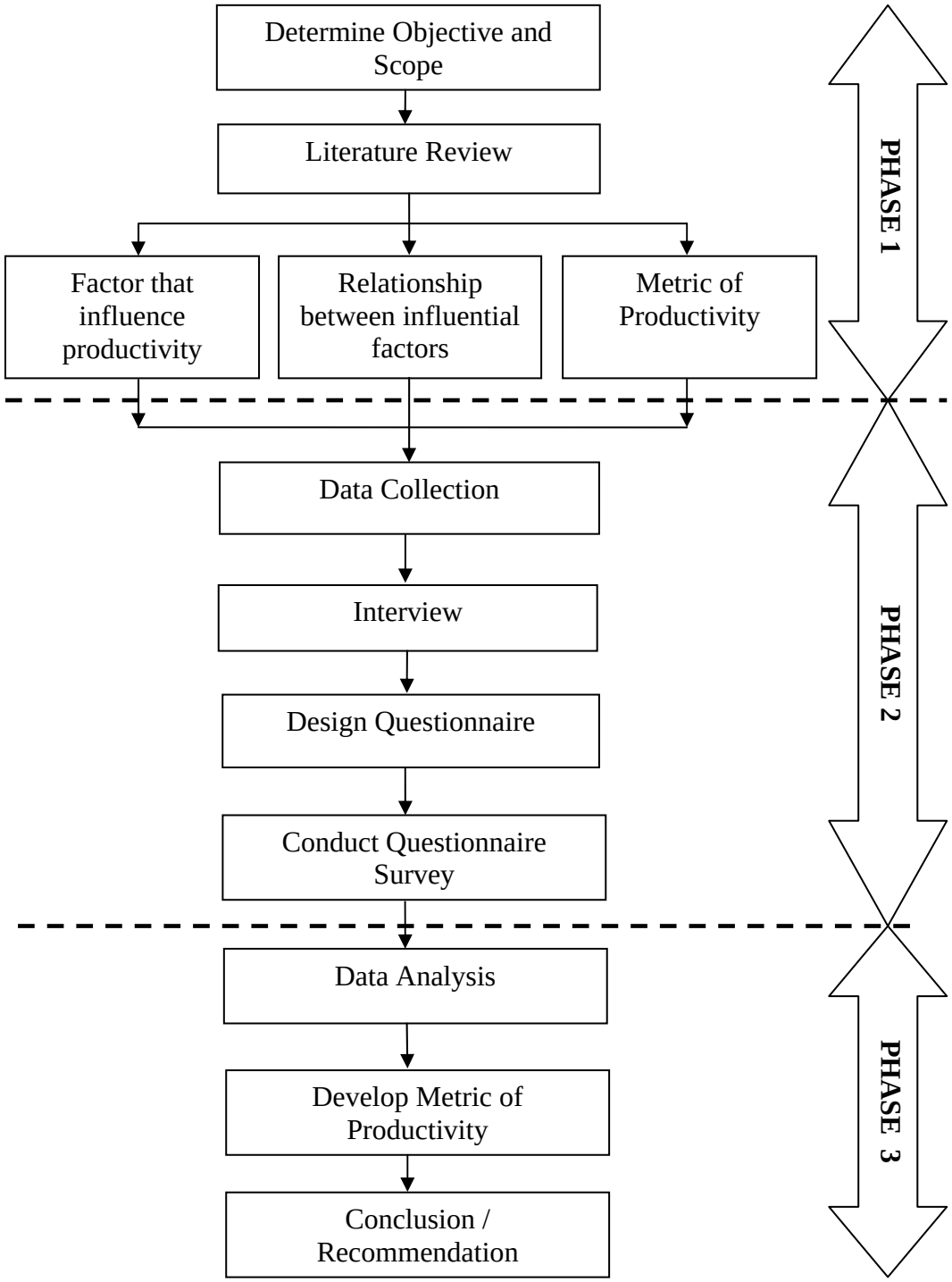

Figure 1.1 : Brief research methodology

Information that has been obtained from the literature review, collection of data from previous JKR project and interview were incorporated and validated through the questionnaires survey that has conducted among a sample of population. Data

collected were analysed for the development of metrics of productivity for rendering and tiling works

The third phase was very important and crucial stage of the research study, as it described the results of the raw data collected from the respondents. At this stage the results and data were analyzed using frequency and average/mean analysis in order to get an accurate result. Data obtained from the interviews and questionnaires feedback were presented in the form of table, Bar Chart, Pie Chart and Graphs to generate findings. Based on data and information obtained from phase one and two, the metrics of productivity for rendering and tiling works were developed.

1.5 Summary of Chapters

The report is consists of five (5) chapters. The first chapter, Chapter One describes on introduction to the study that include problem statement, aim and objective of study, scope and limitation of the study, brief methodology of the study and summary of the chapters.

The Second chapter, Chapter Two discuss on the literature review for the definition of productivity in construction industry, productivity measurement, techniques for measuring construction productivity, factors influencing productivity in construction, metrics of productivity and the rendering and tiling works process.

Chapter Three presents a research methodology applied in the study which consists of literature review, collection of data, data sampling techniques, tools to collect data, respondents and method of analysis.

Chapter Four shows the details on data analysis and finding of factors influence the productivity of rendering and tiling works, the relationship between the influential factors and productivity of rendering and tiling works and establishing productivity of rendering and tiling works and discussion.

Lastly, Chapter Five concludes the overall study and suggests a few recommendations for future research.