

INFLUENCE OF REWORK ON THE PROJECT PERFORMANCE

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DEDICATION

Thank you ALLAH SWT for making my dream comes true, I dedicated this thesis to my father Rosman Ujang (late) and my mother Rohani Surip (late) I would not be the person I am today if it were not because of them. Thank you also to my husband Mahathir Datuk Mohd Zaharil, family and friends for all your love, endless support, prayers and encouragement that keeps motivates me throughout this study.

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ABSTRACT

Rework occurs as a result of demand for improvements by clients, revisions to the design, changes to the scope of project and other variations that are addition. As a result of these reforms, rework costs are on the increase and it has indirectly affected cost variability, project completion delays and construction project quality deterioration. This study aims to explore the influence of rework on the project performance and accessed the relationship between rework practices that related to client, design, site management, subcontractor and project scope as part of the project management practices in the context of the developer of affordable housing scheme. A structured questionnaire were used as the principal instrument for collecting data, the respondent are selected based on a convenient sampling methods. A total of 80 questionnaires were distributed involving project engineer, project team, site supervisor and internal staff of the organization. Descriptive and inferential statistic such as correlation coefficient and linear regression were used to analyzed the data. The findings of this studies revealed that rework practices and project performance had an inverse and significant correlation and all six (6) hypotheses drawn from literature reviews were accepted. The findings of this studies also proved that rework practices were gives an influence to project performance. Three main rework practices that influencing project performance are changes initiated by project scope, client and design. Therefore the application of Project Quality Management (PQM), Building Modelling Information (BIM) and proper rework management in the project were suggested as the containment strategy to reduce and eliminate rework practices so then the level of construction project performance can be enhance to the higher level that may benefited to all.

ABSTRAK

Amalan kerja semula berlaku akibat permintaan penambahbaikan oleh pelanggan, semakan semula kepada rekabentuk, perubahan kepada skop projek dan variasi lain yang ditambah. Hasil daripada pembaharuan ini, Kos kerja semula meningkat dan ianya secara tidak langsung mempengaruhi penyimpangan kos, kelewatan penyiapan projek dan kemerosotan kualiti pada projek pembinaan. Oleh itu, kajian ini bertujuan untuk mengkaji pengaruh kerja semula terhadap prestasi projek dan mengakses hubungan antara amalan kerja semula yang berkaitan dengan pelanggan, rekabentuk, pengurusan tapak, subkontraktor dan skop projek di bawah amalan pengurusan projek dalam konteks pemaju skim perumahan yang mampu dimiliki. Soal selidik berstruktur digunakan sebagai instrumen utama untuk mengumpul data, responden dipilih berdasarkan kaedah persampelan yang mudah. Sebanyak 80 soal selidik diedarkan melibatkan jurutera projek, pasukan projek, penyelia tapak dan kakitangan dalaman organisasi. Statistik deskriptif dan kesimpulan seperti koefisien korelasi dan regresi linear digunakan untuk menganalisa data. Penemuan kajian ini mendedahkan bahawa amalan kerja semula dan prestasi projek mempunyai korelasi yang songsang dan signifikan dan kesemua enam (6) hipotesis yang diperolehi daripada tinjauan literatur diterima. Penemuan kajian ini juga membuktikan bahawa amalan kerja semula telah memberikan pengaruh kepada prestasi projek. Tiga amalan kerja utama yang mempengaruhi prestasi projek adalah perubahan yang dimulakan oleh skop projek, pelanggan dan reka bentuk. Oleh itu, penggunaan Pengurusan Kualiti Projek (PQM), Maklumat Pemodelan Bangunan (BIM) dan pengurusan tindakbalas yang betul dalam projek itu dicadangkan sebagai strategi penanguhan untuk mengurangkan dan menghapuskan kerja-kerja semula supaya tahap prestasi projek pembinaan dapat ditingkatkan ke tahap yang lebih tinggi yang boleh memberi manfaat kepada semua orang.

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LIST OF ABBREVIATIONS

VO	-	Variation Order
IBM	-	International Business Machine, multinational Computer and information technology company
MIS	-	Mean Item Scores
IV	-	Independent Variables
DV	-	Dependent Variables
SPSS	-	Statistical Package For Social Science
UTM	-	Universiti Teknologi Malaysia
PMI	-	Project Management Institute
PQM	-	Project Quality Management
ANOVA	-	Analysis Of Variance
BIM	-	Building Information Modelling
UK	-	United Kingdom
USA	-	United States Of America

LIST OF SYMBOLS

n	-	Sample size
r	-	Pearson
β	-	Beta
p	-	Probability value
R^2	-	R-squared
t	-	t statistic

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CHAPTER 1

INTRODUCTION

1.1 Background of The Study

Construction industry is one of the industries that play an important role in any nations economics growth and enhancement. Unfortunately, the industry is faced with the significant problems on the project delivery, poor financial performance and inability to deliver value on time to consumers. As a result, the industry has been criticised for poor performance and inefficient productivity. A major factor contributing to this problem is rework.

Rework can be defined as the unnecessary effort of redoing an activity that was inaccurately done the first time Love (2002a). In essence, rework and waste have generally been identified as the factor affecting the performance and productivity aspects of construction projects Alwi, Hampson and Mohammed, (2002); Josephson, Larson and Li (2002). Palaneeswaran (2006) claimed that the construction industry is largely project based and various complexities are inherent in the construction projects such as dealing with diverse interests of multiple stakeholders and resultant changes. Due to these characteristic complexities of construction, modifications may be deemed inevitable in some instances; however, uncontrolled occurrences of rework and wastages should actually be more effectively controlled in order to improve various targeted objectives of construction project management with respect to timeliness, cost targets and product and service quality Palaneeswaran (2006).

Rework is a major contributor to time wastage and schedule overruns that eventually impact on cost, resources and quality Love and Edwards (2004a). The adverse effect of rework include lower profit margins, loss of market share, damaged reputation, increased turnover of management and staff turnover, lower productivity,

and higher the costs Eden, Williams and Howicks (2000), all of these factors can affect the achieving project high performance that can be define as a project that meets its objectives within budget and scheduled. This evaluation criterion has remained as the most common metric in many industries. But for a development project, performance goes beyond meeting schedule and budget goals, it includes delivering the benefits and meeting expectations of beneficiaries, stakeholders, donors or funding agencies. However, little is known about the impact and consequently, rework remains an innate problem. The lack of attention to the impact of rework to the project performance seems to be a global phenomenon. With this in mind, the objectives of this research is to determine the influence of rework to the project performance so that effective containment strategies can be developed.

1.2 Statement Of The Problem

Rework occurrences adversely impact the project performance aspects e.g. with respect to costs, time, stakeholder satisfaction. Direct impacts of rework on project management transactions include (a) additional time to rework, (b) additional costs for covering rework occurrences, (c) additional materials for rework. Previous studies suggested that the expenses of rework in poorly managed projects can be as high as 25% of contract value and 10% of the total project costs Love and Li (2000), for example, the Construction Task Force in UK reported that up to 30 percent of construction was attributable to rework and the USA based Construction Industry Institute has estimated the annual loss due to rework could be as high as US\$ 15 billion for industrial construction projects CII, (2001a).

In Malaysia in particular, studies conducted by Yap et.al (2017) unveiled that the cost of rework can be range from 3.1 to 6% of the total project value and the schedule growth due to rework to range from 5.1 to 10% in 5 year of studies. Figure 1.1. Provides a cost impact due to rework in the literature (Malaysia).

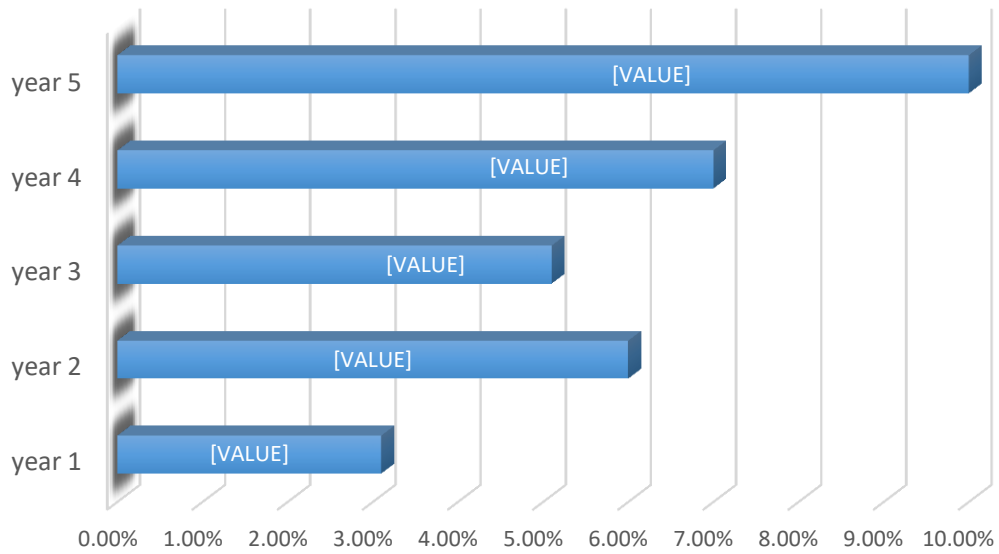


Figure 1.1 Cost Impact Due To Rework (Malaysia)

Sources : Yap et.al (2017)

Rework is a significant contributor to time wastage and time/ schedule overruns CII, (2001b), which will eventually impact on costs (e.g. indirect costs such as overheads), resources and quality as well Love et al (2004). Figure 1.2. provides a cost impact due to rework reported in the literature (International).

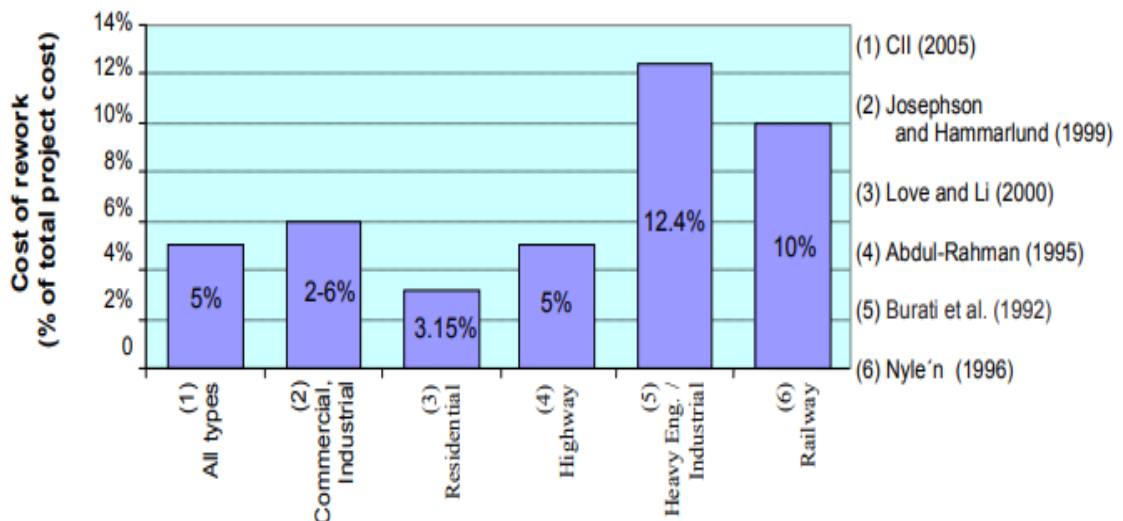


Figure 1.2 Cost Impact Due To Rework (International)

Rework also triggers claims for extra costs and time wasted in redoing or repairing, given that contractors for example, would seek some form of compensation from those they may consider responsible, wherever possible Palaneeswaran et al. (2006). Figure 1.3. provides a frequency of rework occurrences and causes classification form the previous studies on rework. Rework is obviously detrimental to project outcomes. However, there is still a lack of attention among the construction industry players, this study is to investigate the influence of rework on the project performance and to propose effective measures to minimise the occurrence of rework in the affordable housing development in the context of Malaysia.

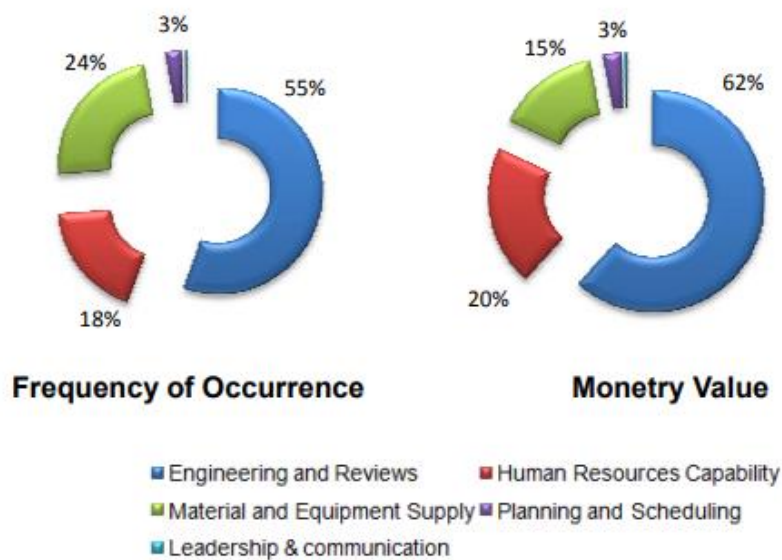


Figure 1.3 Frequency of rework occurrences and the classification of causes.

1.3 Research Objectives

The overall objective of this research is the improvement construction productivity in the organization by focusing on rework as one of the major determinants of project performance. The specific objectives of the study are :

1. To identify the level rework practices among Project manager and project teams.
2. To assess the current project performance level in the affordable housing development scheme.
3. To examine the relationship between rework practices and project performance.
4. To determine the influence of rework practices toward project performance.

1.4 Research Question

In order to realize these objectives, the following research questions arose :

1. What is the level of rework practise among the Project Manager and project teams in the project?
2. What is the current project performance level in the affordable development?
3. Is there a relationship between reworks practices and project performance?
4. Is there an impact or influence of rework practices towards project performance?

1.5 Research Hypotheses

H1a. There is significant correlation between the rework with project performance

H1b. There is significant correlation between client related rework with project performance

H1c. There is significant correlation between design team related rework with project performance

H1d. There is significant correlation between site management related rework with project performance

H1e. There is significant correlation between subcontractor rework with project performance,

H1f. There is significant correlation between project scope rework with project performance

H1g. There is an impact or influence of rework on project performance

1.6 Scope Of Study :

This study will be focusing on the causes and influence or an impact of rework on the project performance in the single organization that been exist for more than 20 years in the construction industries, developing affordable housing for public which was located in Klang Valley, Malaysia. This study were also involve Project Managers, Projects Team, Site Supervisor and internal staff of the company as the respondent. As mentioned above, the objectives of this study is to investigates on the a) rework practice behaviour in the project, b) current project

performance level, c) relationship between rework practices and project performance and d) an impact or influence of the rework on project success.

The information and data gained from this study is limited, as its only based on the opinions of the interviewed participants and involving internal employees in a single organization.

1.7 Significance Of The Study

The study gives significant benefit to both the academicians and industry practitioners as the findings of the research will be the contribution to the body of knowledge which were useful to academicians and students who are interested in pursuing more knowledge as it has theoretical relevance in the field of project management. The research will also provide practitioners with good understanding of how rework within their organisations can influence and gives an impact to the project performance. This study also significant in several aspects including :

1. It addresses rework as a major determinants of project performance
2. It will contribute to the understanding of rework in construction projects, focusing on affordable housing developments.
3. It increase awareness of the possible problems which may result from reworks
4. The above three (3) aspects of the study will leading to the following benefits:
 - a) Enhancing productivity levels by reducing reworks, which will positively impact the progress of the project and will lead to high project performance.
 - b) Reducing time overruns associated with reworks

- c) Reducing cost overruns associated with reworks
- d) Minimizing any possible conflicts which may result to reworks

Therefore, this study will be a reference and guide to academicians, student and industry practitioners as very limited study were conducted in this area in the context of Malaysia Construction Industry.

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