

## Improving Time Performance in Construction Projects: Perspective of Contractor

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**Abstract:** Malaysian construction sector has not escaped from the problem of time overrun. Huge numbers of construction projects are experiencing this important issue of overrun in time nationwide. This might be because of poor project management. Thus; it is very important to develop a proper time management system. Further, due to the uniqueness of construction projects, it is also imperative to propose various possible improvement methods which can be applied in various projects according to prevailing conditions. Hence, this study aims to study the methods to help the construction players in reducing time overrun problem. For this, a total of 89 gathered samples collected through survey in Peninsular Malaysia were analyzed using statistical software SPSS v21.0 with the Kendall's concordance test. The findings of this study revealed that top improving method for controlling time are proper planning of work, committed leadership and management, close monitoring, send clear and complete message to the worker to ensure effective communication, and hire skilled workers to achieve good progress. Overall, this study has suggested 13 improvement methods for reducing the occurrence of time overrun in Malaysian construction industry. These findings will assist practitioners to prepare the effective strategies for achieving successful completion of the projects.

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### 1. Introduction

Now days, huge numbers of construction projects are launched in Malaysia in following the Government plan to bring Malaysia in the list of developed country by 2020. Since, construction project is unique in nature, and every construction project differs from another project in scope, period, purposes, uncertainty, difficulty, deadlines and some other measurements. Hence, construction projects experience several constraints such as material, organizational, professional and work package constraints (Edum-fotwe et. al, 2008). Because of these constraints, the industry is constantly facing dilemma of time overrun which has become a common phenomenon globally (Le-Hoai et. al, 2013). The occurrence of time overrun has offered adverse effects of the development plans. It causes many negative effects such as lawsuits between owners and contractors, increased costs, loss of productivity and revenue, and contract termination (Tumi et. al, 2009). In Egypt, the problem of time overrun has led to dispute and litigation cases (Marzouk and El-Rasas 2013).

This problem of time overrun has adversely affected the targeted achievements of construction development plan in many countries. A survey conducted in Vietnam showed that 72% of respondents involving in survey had frequently faced time overrun in their projects (Luu et. al, 2009). Similarly, in Saudi Arabia, 76% and 56% of the participating contractors and consultants respectively

indicated that, average time overrun experience in their project was ranging in between 10% and 30% of the original project duration (Assaf and Al-Hejji, 2006). Kikwasi (2012) investigating the causes of delay and disruptions in construction projects in Tanzania, through questionnaire found that according to the client, consultants and contractors only 22%, 30% and 44% construction completed on estimated time respectively. Also results showed that the maximum amount of time overrun was 78%, 70% and 56% for clients, consultants and contractors respectively. This problem of time overrun in construction projects has resulted in dissatisfaction to all the parties involved in the construction industry. Thus, there is a need to propose effective methods to improve time performance. Hence, this study aims to investigate various methods for improving time performance in construction projects. However, the collection of data in this study is limited to acquire perception of contractor's firms only.

### 2. Improvement Method of Time Performance

For achieving successful construction projects, one of the fundamental conditions is that the projects must be completed within the contracted duration. During the last few decades, numerous researchers have suggested various improvement methods to overcome the issues of time performance in the construction projects. It is essential to take appropriate action to improve the estimated activity duration to accomplish it within estimated time.

Improvement methods are necessary actions to minimize losses. Proper planning and proper payment from the client are the basic improving measures to avoid time overrun (Tumi et. al. 2009). Besides that, Gunduz (2013) suggested that the time overrun can be avoided or minimized when their causes are clearly identified. Also, those contractors should not be rewarded any project which have lacked insufficient expertise. Further, the contractors should pay more attention to prepare effective planning and scheduling. Abdul Rahman et. al. (2006) identified the improvement methods to mitigate and also recover the time overrun. The authors mentioned that the improvement methods depend on the type of the problem/s that causes the delay of the project. It is

also recommended that the productivity can be increased by working overtime hours or work by shifts. Besides that, regular site meetings between all functional groups are helpful in understanding the construction problems at early stage and the management can suggest a change in construction method or use different technology to improve the time performance. In identifying common improvement methods, a total of 13 methods were identified through literature review which were considered for further investigation to find the effectiveness of these improvement method towards Malaysian construction industry. The identified improvement method as presented in Table 1.

Table 1: Improvement Methods for Time Performance

Improvement Method	References
Proper planning work	Danso and Antwi 2012, Tumi et. al. 2009, Rahman et. al. 2012
Committed leadership and management	Memon et. al. 2012
Close monitoring	Danso and Antwi 2012, Enshassi et. al. 2009, Memon et. al. 2013, Memon et. al. 2012
Send clear and complete message to worker to ensure effective communication	Aziz 2013, Kaliba et. al. 2009, Rahman et. al. 2012
Hire skilled workers to achieve good progress, avoid poor quality of work, more rectification and double handling	Aziz 2013, Gunduz 2013, Rahman et. al. 2012
Focus on the quality, cost and delivery of the project	Enshassi et. al. 2009, Kaliba et. al. 2009, Pai and Bharat 2013, Rahman et. al. 2012
Training and development of all participant to support delivery process	Fugar and Agyakwah-Baah 2010, Kamaruzzama and Ali 2010, Rahman et. al. 2012
Fully utilize the construction team	Rahman et. al. 2012
Use new construction technologies (IBS-Industrialize Building System)	Rahman et. al. 2012
Focus on client's need	Rahman et. al. 2012
Provide knowledge/training to unskilled workers based on their scope of work.	Enshassi et. al. 2009, Fugar and Agyakwah-Baah 2010, Lee-Hoai et. al. 2008
Adoption of tools and techniques i.e. Value Management, Lean Thinking, Total Quality Management	Al-Tabatabai 2002, Rahman et. al. 2012
Measure performance against other projects	Rahman et. al. 2012

### 3. Research Method

A quantitative method of research using a structured questionnaire was used to gather information regarding the effectiveness of improvement methods of time performance. Respondents from contractor organizations were contacted to participate in the survey process. Scale used for data collection included Extremely Effective, Very Effective, Moderately Effective, Slightly Effective and Not Effective. Analysis of data was carried out with statistical software SPSS. Kendall's concordance test for calculating mean rank

was used to determine effectiveness and ranking of improvement methods for time overrun. Kendall's coefficient of concordance indicates the degree of agreement and is computed by the following equation.

$$W = \frac{12U - 3m^2n(n-1)^2}{m^2n(n-1)}$$

Where:

$$U = \sum_{j=1}^n (\Sigma R)^2$$

n=number of factors;

m=number of the groups;  
j=the factors 1, 2, 3, 4 ...N.

#### 4. Research Findings

The questionnaire sets were distributed among the respondents randomly selected in peninsular Malaysia. A total of 89 samples were collected against 100 distributed questionnaire sets. The demographics analysis presents the detailed characteristics of the respondents. The respondents involved in the survey are from a different organization. Besides, the respondents also had several years of experience in handling different category and size of projects. The demographics of the respondents as summarized in Table 2.

Table 2: Demography of Respondents

Characteristic	(%)
Category of Organization	
Private	91.0
Government	2.2
Joint Venture	3.4
Others	3.4
Size of Project	
<1 Million	6.7
1 – 5 Million	20.2
6 – 10 Million	11.2
10 – 50 Million	43.8
> 50 Million	18.0
Qualification	
Diploma	12.4
Degree	53.9
Master	27.0
Others	6.7
Working Experience	
< 10 Years	37.1
11 – 20 Years	42.7
21 – 30 Years	12.4
> 31 Years	7.9

Table 2 shows that the majority (91.0%) of the respondents are from private organization followed by joint venture and government with 3.4% and 2.2% respectively. A significant number (43.8%) of respondents are involved in handling the projects of contract cost of RM 10 -50 million; 20.2% of the respondents are involved in the projects of contract amount of RM 1 – 5 Million, 18.0% of the respondents are involved in projects of the contract amount of more than RM 50 Million and 11.2% respondents are involved in project of contract amount of RM 6 – 10 Million. There are only 6.7% respondents involved in projects with contract amount less than RM 1 Million. Among the

respondents, 53.9% of the respondents have obtained a bachelor degree, 27.0% respondents have attained master degree and 12.4% respondents are diploma holders. About 42.7% of respondents have working experience between 11 to 20 years, 37.1% of respondents have experience for less than 10 years. 12.4% and 7.9% respondents have working experience of 21-30 years and more than 31 years respectively. The demographic characteristics showed that the participants taking part in survey are reliable for providing data. Hence, the data was further processed to assess the improvement methods.

The evaluation of the level of agreement or concordance amongst contractors' perspective on improving time performance in construction projects is explained based on the measure on the relationship between rankings of improving time performance. The value of The Kendall's Coefficient of concordance is 0.125 which is more than 0, so there is some level of agreement (Frimpong et. al. 2003). The ranking of the improvement methods was done based on mean rank value as shown in table 3.

Table 3: Ranking of Improvement Methods

Improvement Method	Mean Rank	Rank
Proper planning work	9.17	1
Committed leadership and management	8.87	2
Close monitoring	7.62	3
Send clear and complete message to worker to ensure effective communication	7.52	4
Hire skilled workers to achieve good progress, avoid poor quality of work, more rectification and double handling	7.28	5
Focus on the quality, cost and delivery of the project	6.94	6
Training and development of all participant to support delivery process	6.89	7
Fully utilize the construction team	6.76	8
Use new construction technologies (IBS-Industrialize Building System)	6.43	9
Focus on client's need	6.02	10
Provide knowledge/training to unskilled workers based on their scope of work.	5.92	11
Adoption of tools and techniques i.e.: Value Management, Lean Thinking, Total Quality Management	5.87	12
Measure performance against other projects	5.72	13

From table 3, it is found that top 5 effective improvement method of time performance based on contractors' perspective are i. Proper planning work, ii. Committed leadership and management; iii. Close monitoring, iv. Send clear and complete message to the worker to ensure effective communication and v. Hire skilled workers to achieve good progress, avoid poor quality of work, more rectification and double handling.

➤ **Proper planning work:** Proper planning work is the most effective method for improving time performance in the construction projects. Memon et. al. (2012) highlighted that the contractors should ensure adequate construction planning to alleviate time performance of the construction projects.

➤ **Committed leadership and management:** Committed leadership and management are the driving forces for improvement and communicating the required cultural and operational changes throughout the project. Besides, committed leadership and management commitment provides a motivating force and resources for an organization and controlling activities of a project.

➤ **Close monitoring:** It is recommended that the contractors must monitor the quality of work activities continuously to set the required quality system in the different activities of the project. This will avoid the occurrences of mistakes which lead to rework of activities. This also helps in improving the time performance of the projects (Danso and Antwi 2012, Enshassi et. al. 2009).

➤ **Send clear and complete message to worker to ensure effective communication:** Effective communication is an effective method in controlling time overrun. Since, there are many parties involved in the project; communication with other parties is a very important factor to achieve success in the project. Hence, it is important that clear and complete information between various parties must be distributed among the workers during each phase of construction. Any problem with communication will result in severe misunderstanding which can cause delay in activities (Aziz 2013, Kaliba et. al. 2009).

➤ **Hire skilled workers to achieve good progress, avoid poor quality of work, more rectification and double handling:** Unskilled workers may lead to inefficient work and cause accidents during construction (Aziz 2013 and Gunduz 2013). Hence, contractors are recommended to hire quality and experienced workers in order to follow the different managerial and technical aspects of the project (Enshassi et. al. 2009)

#### 4. Conclusion

The issue of time overrun in the construction projects is a worldwide phenomenon which occurs almost in every project. Hence, this paper studied the methods for improving time performance. Study was carried out through survey where 89 construction practitioners had participated. Survey data was analyzed with statistical software SPSS V19. Analysis results showed that top 5 effective methods for improving time performance are; proper planning work, committed leadership and management, close monitoring, send clear and complete message to worker to ensure effective communication and Hire skilled workers to achieve good progress, avoid poor quality of work, more rectification and double handling.

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