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Level Of Impact On Factors Governing Time Overrun In Construction Projects

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Abstract

Construction companies focus on mitigating time overrun in construction projects. Time overrun is one of the major constraints faced by the construction industry. Conversely, time overrun prevails in all stages of the construction process and thereby augments the project total period (Yang and Ou, 2008). In rare cases, the projects are completed on time (Assaf and AlHejji, 2006) [2], and henceforth it is necessary to pay stern attention to managing time in construction projects as delay in each and every day adds to a significant sum of revenue which is barely recovered. Therefore, researchers have started to investigate the factors affecting time overrun in construction projects across different countries and cities. In Indonesia, factors such as changes in design, insufficient planning, deprived labour productivity, and shortage of resources influence time overrun in high-rise buildings (Kaming et al., 1997) [5]. Considering the time overrun factors and its impact, it is need to pay attention focusing on the major factors that have a high influence on construction projects.

Keywords: *Time overrun, construction resource optimization, material, manpower, project management, contract administration, machinery.*

1. INTRODUCTION

Time overrun results in resource wastages and affects the profit margins in their completion of the projects it creates major financial issues among the parties, According to Alinaitwe et al. (2013) [1] revealed that five factors persuade the cost overruns in construction projects in Uganda. They are alteration according to the extent of work, instability, late payments, high political insecurity and cost of capital, and deprived monitoring and control. The link between the reasons for project delays and cost overruns is moderate in this study. Rahman et al. (2013) identified that resources such as material, manpower, and money significantly influence cost overrun and among these factors' construction material is the most dominant factor influencing cost overrun in construction projects.

2. LITERATURE REVIEW

Number of construction factors influence time over run-in construction projects. In Kuwait, the factors such as alteration in orders, financial complexities faced by the owner, and lack of experience of the owner are the most significant causes for time retardation in private residential projects (Koushki et al., 2005) [7].

In Palestine, contractor's financial status, owner retards in making the payment, deprived interaction between parties, the political circumstance and partition of the West Bank, severe rivalry in bids, and shortage of efficiency of the equipment are the factors that influence time overrun in road construction projects (Mahamid, 2013) [8]. In Peninsular Malaysia, financial complexities and cash flow problems faced by contractor, inefficient contractor, deprived supervision and site management, financial

complexities faced by the owner and lack of workers are found to be the most important causes for time overrun in Malaysian construction projects

(Memon et al., 2014). Memon et al. (2014) [9] found that financial complexities and cash flow problems faced by contractor, inefficient contractor, deprived supervision and site management, financial complexities faced by the owner and lack of workers are found to be the most important causes for time overrun in Malaysian construction projects. It is suggested that time overrun issues can be proscribed by perfectly planning the work, effective contact system, dedicated leadership, and management. Henceforth, this study firstly aims to determine the causes for time overrun in construction.

Katre and Ghaitidak (2016) [6] stated that decreased labour productivity, retarded bill payment, riots, deprived procurement programming of resources, improper maintenance of equipment, strikes, and other external facets are the vital reasons for a project delay. Luvara et al. (2018) revealed that delays in decision making, incomplete design, and improvement of design changes during the construction stage were found to be the most severe factors contributing to cost overrun and time overrun. Conversely, time overrun prevails in all stages of the construction process and thereby augments project total period (Yang and Ou, 2008).

Baloyi & Bekker (2011) [3] investigated the reasons or causes for cost invade and time delays amid the overhauling and development of the different stadia. The results indicated that the increase in material cost is the single largest contributor to cost overruns for both global and stadia projects. With respect to time delays, the most significant contributing factor for global projects was a late delay in payments while for the stadia projects design-related factors caused the most delays.

In rare cases, the projects are finished on time (Assaf and Al-Hejji, 2006) [2] and henceforth it is necessary to pay stern attention to manage time in construction projects as delay in each and every day adds to significant sum of revenue which is barely recovered. Therefore, researchers have started to investigate the factors affecting time overrun in construction projects across different countries and cities.

3. METHODOLOGY

This research aims to explore Time overrun from the perspective of civil workers in Tamil Nadu. The type of sampling employed for this study is purposive sampling as it measures time overrun factors from the perspective of civil workers involved in constructing apartments in Tamil Nadu. Civil Employees were contacted and questionnaires were self-administered to those civil workers for obtaining responses. 450 samples were taken for further analysis after eliminating the response bias. The instrument encompasses of five parts owner/client responsibility related factors, resource-related factors, contractor responsibility related factors, consultant responsibility related factors, other factors. Once after collecting the data, all the data were entered into the Statistical Package for Social Sciences (SPSS) Version 22 software and it was coded, cleaned, labelled and checked for the missing values. The missing values were filled with the mean series and it is checked for reliability and validity of the instrument. Exploratory Factor Analysis (EFA) using Principal Component approach using varimax rotation is carried out to extract the factors for the study.

4. Analysis

4.1 exploratory factor analysis

Constructs	**Factor loadings**	**% Variance**
Factors affecting time overruns		
Owner/client responsibility		
Change in the scope of the project.	0.965	**71.0**
Delay in progress payment by the owner.	0.936	
Financial difficulties of the owner.	0.749	
Delays in decisions making.	0.790	

Owner interference.	0.634	
Unrealistic contract duration and requirements imposed.	0.557	
Consultant responsibility		
Delay in inspection and approval of completed works.	0.877	**81.2**
Unrealistic contract duration and requirements imposed.	0.950	
Frequent design changes.	0.704	
Mistakes and Errors in design.	0.313	
Delay Preparation and approval of drawings.	0.306	
Contractor responsibility		
Inadequate planning and scheduling.	0.347	**65.0**
Lack of experience.	0.748	
Poor site management and supervision.	0.800	
Incompetent subcontractors.	0.832	
Cash flow and financial difficulties faced by contractors.	0.775	
Mistakes during construction.	0.897	
Resource related factors		
Shortages of materials.	0.390	**63.2**
Late delivery of materials and equipment.	0.726	
Insufficient Numbers of equipment.	0.885	
Labour productivity.	0.827	
Shortage of site workers.	0.696	
Other factors		
Effect of weather.	0.431	**72.4**
Unforeseen ground condition.	0.821	
Accidents on site.	0.979	
Lack of coordination between parties.	0.888	
Lack of communication between parties.	0.891	
Laws and regulatory framework.	0.815	

Clear information and communication channels	0.723
Frequent coordination between the parties	0.823
Perform a pre-construction planning of project tasks and resources needs.	0.884
Developing human resources in the construction industry.	0.793
Comprehensive contract administration.	0.839
Improving contract award procedure by giving less weight to prices and more weight to the capabilities and past performance of contractors.	0.371

Table 4.1: Exploratory Factor Analysis with percentage variance and factor loadings

The above table 4.1 shows the results of Exploratory Factor Analysis (EFA) by employing Principal Component Approach with varimax rotation. The results obtained consist of 5 constructs that has been obtained from 25 items identified and espoused from various literatures. The factor loadings for the items considered for this study is above 0.30 based on the thumb rule proposed by Hair et al. (2013) [4] where the author stated that the loadings above 0.30 should possess a sample size of 350 or greater. As the sample size of this study is 460, the loadings fulfilled the criteria of practical significance.

DISCUSSIONS

The factor "owner/client responsibility related factors" consists of six items with 71.0 percent variance and factor loadings higher than 0.50 which actually fulfils the principle of significance i.e. the factor loading greater than 0.50 should possess a sample size of 120 and above (Hair et al., 2013) [4]. The factor "consultant responsibility related factors" consists of five items with 81.2 percent variance and factor loadings higher than 0.30 which actually fulfils the principle of significance i.e. the factor loading greater than 0.30 should possess a sample size of 350 and above (Hair et al., 2013) [4]. The factor "contractor responsibility related factors" consists of six items with 65.0 percent variance and factor loadings higher than 0.30 which actually fulfils the principle of significance i.e. the factor loading greater than 0.30 should possess a sample size of 350 and above (Hair et al., 2013) [4]. The factor "resources related factors" consists of five items with 63.2 percent variance and factor loadings higher than 0.30 which actually fulfils the principle of significance i.e. the factor loading greater than 0.30 should possess a sample size of 350 and above (Hair et al., 2013) [4]. The factor "other factors" consists of six items with 72.4 percent variance and factor loadings higher than 0.40 which actually fulfils the principle of significance i.e. the factor loading greater than 0.40 should possess a sample size of 200 and above (Hair et al., 2013) [4].

CONCLUSIONS

From the result, the major factors that influence the time overrun in construction projects were explored and these factors require prior mitigation measures to minimize time overrun and its impact on construction projects. owner/client responsibility related factors treated at the stage of planning and also from the data of tracking records of earlier completed projects, resource-related factors are uncertain and it needs application of project management planning and scheduling, contractor responsibility related factors and consultant responsibility related factors requires selection of suitable by analysing their past project record and project can be allotted not only on the basis finance and also by considering projects handled. In future research, it is suggested to identify Mitigation measures that can optimize the project.

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