



RESEARCH ARTICLE

FACTORS AFFECTING THE FAILURE OF A CONSTRUCTION PROJECT IN NEPAL

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ABSTRACT

An issue of major concern within the construction industry worldwide is so called 'project delay', whereby negotiated contracts and/or planned schedules for construction between organizations are not met in the specified time. Such project delays may be caused by the actions of the consultant and contractor. The research has been structured as the case study of construction projects during implementation phase aspects of Kathmandu valley. It revolves around the secondary data sources collected from the organization's periodic publications, yearly reviews, customer feedback charts and market analysis of the company in competition with the others with same business process design. In order to minimize costly and time-consuming delays, project managers are required to identify and be aware of the potential causes and their possible effects on the overall completion of a construction project. Hence determining the contractual responsibility of delay is the most likely source of dispute in construction projects.

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INTRODUCTION

The construction industry has a great impact on the economy of all countries (Assaf, Al-Khalil, and Al-Hazmi, 1995). It is one of the sectors that provides a crucial ingredient for the development of nations' economy (Alnuaimi and Mohsin, 2013). During execution of construction projects, the works proceed at a slower pace than planned, and delays frequently appear. Their appearance leads to additional cost generation, conflicts among project participants. The construction industry in many countries accounts for 6-9 percent of the Gross Domestic Product (GDP) (Challal and Tkouat, 2012); and according to Bhimaraya, (2001), it reaches up to 10 percent of the GDP of most countries. Delays are one of the biggest problems in construction industries. Delays can lead to many negative effects such as lawsuits between owners and contractors, increased costs, loss of productivity and revenue, and contract termination. However, delay situations are complex in nature because multiple delays can occur concurrently and because they can be caused by more than one party, or by none of the principal parties. One delay may contribute to the formation of other delays.

The analysis of these delays involves not only the calculation of the delay time but also the identification of the root causes and the responsible agent for delays. Such an analysis therefore becomes a basis for the financial calculations that determine penalties or other damages to be assigned to the parties responsible for the delays. (Aibinu and Jagboro, 2002; Aigbavboa, Thawala, and Mukaka, 2014; Alaryan, Elshahat, and Dawood, 2014; Al-Kharashi and Skitmore, 2009) The scope of this study was research to analyze the causes and consequences of delay in construction project. Projects investigated in this study included government and privately funded project which vary between building and road project of different complexity. The literature related the field of causes and consequences of delay in a construction projects has been reviewed over the last decade. (Owalabi *et al.*, 2014) Projects are classically defined by the need to complete a task on time, within budget, and with appropriate technical performance/quality. In recent decades, projects have tended to become more time constrained, and the ability to deliver a project quickly is becoming an increasingly important element in winning a bid. A project consists of collections of activities. An activity's completion may be delayed due to a delayed start or extended activity duration. While an activity's start may be delayed due to certain reasons, its duration may be extended due to some other reasons. Activity's delayed completion may cause delays in the succeeding activities, which in turn can

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cause a delay in the project completion.(Srdić and Ph, 2015) Delays can give rise to disruption of work and loss of productivity, late completion of the project, increased time-related costs and third party claims and abandonment or termination of the contract. Methods of minimizing construction delays can be established when causes of delays are identified. Knowing the cause of any particular delay in a construction project would help to avoid the same. (Murali Sambasivan and Soon, 2007; Shehu and Mohammed, 2016) studied the effects of construction delays on project delivery in Nigerian construction industry. The six effects of delay identified were: times overrun cost overrun, dispute, arbitration, total abandonment, and litigation. By a questionnaire evaluates and through empirical method assesses the effects of construction delays, and the findings showed that time and cost overruns were the frequent effects of delay. The delay had significant effects on completion cost and time of sixty-one building projects studied.

reviews, the population was huge and non-comprehensible. Thus, an ideal method was to be found out instead of the simple random method. Hence the data was clustered and extracted for reference rather than random selection of data without clustering. Certain web-based information and old data sources for reference were purely taken on judgment with an assumption of higher inclination with the study but maintained to be for purely referential purposes to avoid deviation of the mean (in theoretical terms).

RESULTS

The objective of conducting the analysis for this section is to establish the factors under the groups of causes identified from the literature review and the ranking according to their significant influence towards construction project delays. A ranking method was used to achieve this objective and the significant of using these methods is it can reveal the most influential factors within each category of causes.

Table 1. Result of factors causes delays

S.N	Factors	Consultant		Contractor		Spearman's Rank Coefficient rho (rs) rs = 0.679, Z = 0.094
		Index	Rank	Index	Rank	
1	Shortage of construction materials	4.2	1	4.24	1	
2	Poor quality of construction materials	3.7	5	3.73	5	
3	Poor procurement of construction materials	3.85	4	3.6	7	
4	Imported of construction materials	3.89	3	3.82	3	
5	Escalation of materials prices	3.57	6	3.71	6	
6	Late delivery of materials	4.09	2	3.96	2	
7	Unreliable suppliers	3.07	7	3.76	4	

Delay in the delivery of materials and equipment to construction sites is often a contributory cause to cost overruns in construction projects in developing countries. However, the actual impact of these delays on project costs was found to be on average, only about 0.5 percent of the total budgeted cost of the projects.(M Sambasivan, 2007) Construction cost overrun is a common problem in the construction industry. It is believed that construction projects experience an increase in cost of about 33 percent on average.(M Sambasivan, 2007; Srdić and Ph, 2015; Sumaiyya and Pranay, 2013) Over the past few years state transportation agencies have experienced an increasing trend of construction cost overruns.

MATERIALS AND METHODS

The research has been structured as the case study of construction projects during implementation phase aspects of Kathmandu valley. It revolves around the secondary data sources collected from the organisation's periodic publications, yearly reviews, customer feedback charts and market analysis of the company in competition with the others with same business process design. Rather than using large samples and following a rigid protocol to examine a limited number of variables, case study method involves an in-depth, longitudinal examination of a single instance or event that is termed as 'case'. It provides a systematic way of looking at events, collecting data, analysing information, and reporting the results. As a result, a sharpened understanding of why the instance happened as it did can be understood, and what might become important to look at more extensively in future research. In the study, the universe of the data (the population) was the pool of information collected through the available project document sources and was kept under rigorous methods under study. The most feasible sampling method observed was as simple random sampling. But with most of the results obtained through customer appraisals and project

Table 2. Ranking of Factors that Causes Delays

S.No	Factors	Consultant	Contractor	Overall	
		Index	Index	Mean	Rank
1	Insufficient Number of Equipment	4.46	4.4	4.43	1
2	Inaccurate Time Estimate Monthly payment	4.48	4.36	4.42	2
3	Difficulties	4.43	4.29	4.36	3
4	Change Orders	4.39	4.31	4.35	4
5	Inaccurate Cost Estimate	4.35	4.27	4.31	5
6	Poor site Management and supervision	4.3	4.22	4.26	6
7	Inadequate Modern Equipment	4.33	4.18	4.25	7
8	Shortage of Construction Material	4.2	4.24	4.22	8
9	Incompetent project Team	4.28	4.16	4.22	8
10	Improper project planning and scheduling	4.24	4.13	4.19	9
11	Contractor's Financial Difficulties	4.26	4.04	4.15	10
12	Inappropriate Construction Methods	4.22	3.99	4.12	11
13	Unreliable Subcontractor	4.17	3.93	4.08	12
14	Labor Productivity	4.11	3.87	4.05	13
15	Frequent Equipment Breakdown	4.13	3.81	4.01	14
16	Late Delivery of Materials	4.09	3.75	3.98	15
17	Shortage of Skill Labor	4.04	3.69	3.94	16
18	Poor Design and Delays in Design	3.98	3.63	3.91	17
19	Slow Site Clearance	4.07	3.57	3.87	18
20	Labor Supply	4	3.51	3.84	19
21	Slow Decision Making by Client	3.96	3.45	3.80	20

22	Lack of Communication / Coordination	4.02	3.39	3.77	21
23	Slow Response and Poor Inspection	3.93	3.33	3.73	22
24	Imported Construction Materials	3.89	3.27	3.70	23
25	Lack of Experience of Client in Construction	3.91	3.21	3.66	24
26	Slow Mobilization of Labor	3.85	3.15	3.63	25
27	Slow Mobilization of Equipment	3.87	3.09	3.59	26

Factors causes delays

Total fifty-seven major factors that contributed to causes of delays were identified. The fifty-seven factors were grouped into eight major groups: material related; labor-related; equipment-related; finance-related; contractor-related; client related; consultant-related; and external factors.

These factors were ranked in each group based on relative importance index from the viewpoint of contractor and consultant. In order to establish the level of agreement of correlation in the ranking of both groups of respondents, the Spearman's Rank correlation coefficient was calculated and the null hypothesis was analysed. The null hypothesis will be accepted if the level significant observed is more than 5%. This indicates that a probability of 95% is required to conclude that there is a significant agreement in the ranking of both groups of respondents. The following is a brief description of these factors in each group.

Factors related to delays

There are seven factors that contributed to the causes of delays related to material delays were identified and ranked from the viewpoint of contractors and consultants. Table shows the results of relative importance index and the ranking of factors of materials related delays between respondent of contractor and consultant. In this category, the null hypothesis, H₀ is accepted and this shows that there is no significant agreement in the ranking among the groups of respondents. The Spearman's Rank correlation coefficient, rho (rs) is 0.679 and has a significant value (Z) of 0.094. This value is much higher than 0.05 (5%) which implies rejected the alternative hypothesis, H₁ at a confidence level of 95 percent. Thus the material related delay is one of the major causes of the delay of construction project facing in the construction projects now days.

DISCUSSION

A total of fifty-seven factors that causes delays were identified. Some of these factors were the top ten most important factors that contributed to the causes of delays includes: insufficient numbers of equipment; inaccurate time estimate; monthly payment difficulties; changes orders; inaccurate cost estimate; poor site management and supervision; inadequate modern equipment; shortage of construction materials; incompetent project team; improper project planning and scheduling; and contractor's financial difficulties. (Ramanathan, Narayanan, Idrus, and Teknologi, 2002; Ryu, Lee, and Yu, 2003; Salunkhe and Patil, 2014) The factors were grouped into eight groups of causes of delays. A group of contractor-related delays was ranked the most significant groups that cause delays, followed

by the group of equipment-related delay, client related delays, material-related delays, finance-related delays, consultant-related delays, external-related delays, and labour related delays. These results were comparable with these research findings. (Owalabi *et al.*, 2014; Saeed, 2009; M Sambasivan, 2007)

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