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Do Longer Projects Have Larger Cost Deviation Than Shorter Construction Projects?

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Abstract

Construction cost and delivery time have been used as mutually inclusive measurement for project success in construction industry. In relation to this, several researchers showed a correlation between cost deviation and deviation on delivery time. However, very limited research discussed about the relationship between total construction time and cost deviation. The purpose of this paper is to analyze two specific types of construction projects (roads and buildings) and test if there is a correlation between cost performance and the length of construction time. In other words, respond to the proposition that longer projects have large cost deviation. Further, the research discusses managerial implications by referring what it really matters in cost performance in either of longer or shorter projects. To do this, the research considers various size public road construction projects and building constructions with different project completion time. It uses quantitative research method. The result showed that longer project do not necessarily have higher cost deviation. Unlike the building construction, road construction showed negative correlation between cost and construction time. However, few longer projects showed relatively large cost deviation as compared to smaller projects. This paper also wants to do practical discussions by comparing the attributes of shorter versus the longer projects.

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1. Introduction

Generally, construction industries strive to obtain better performance in every dimensions. In this regard, researchers have long been studied critical success factors of construction projects using different settings, such as

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cost, delay, complexity, size etc. [14], [1], [12]. Typically, cost and project delivery time seems mostly discussed in literature. According to [2] cost overruns and scheduling delays are common occurrences in construction projects. Some attempted to show the dyadic relationship between cost and delivery time. In this regard, one of the causes for cost overrun is lack of accurate executions of various project activities that lead to delay in project delivery [6]. In other words, timely execution of project activities could help to complete the project within predefined budget set. This generally implies the magnitude of cost deviation or performance depend on the amount and quality of operational executions as planned (pre-defined delivery schedule) starting from early phases of a project. This type of approach (looking the dyadic relationship) to evaluate the general performance mainly reflected by two major attributes. The first attribute is related to cost performance that can give three results (cost overrun, cost underrun and cost indifference). Cost overrun, which has been discussed in most construction literature, can be defined as the amount by which the actual cost exceed the budgeted, estimated, original, or target cost. The opposite is considered cost underrun. The breakeven point where the amount of the actual cost equals to the estimated or budgeted cost is called cost indifference (see fig. 1.). The general literature showed that construction success has been evaluated based on these three cost performance margins. In most cases, it seems projects with cost overrun considered as unsuccessful and failed. Nevertheless, according to [10] none of the three-cost performance results guarantee for success but cost overrun obviously makes it difficult to see the project as success. Success is an abstract concept and can be looked in different ways. However, [3] defined success in organized way by classifying success at delivery and post-delivery and looked at it in three stages. The first success is at the delivery stage (focus on the process, doing it right) e.g. cost, time, quality, efficiency. The second one is post-delivery stage (focus on the system getting it right) and finally the third category on similar post-delivery but focus on the benefits getting the project right.

The second attribute is project delivery time in which several researchers focuses on the impact of delay on the cost performance of a project. In this regard, some literature showed the positive correlation between delivery delay and cost performance. For example, [13] argued in his own words that regardless of their source, delays are one of the crucial causes behind the cost overruns. Delayed projects that registered cost overrun categorized as failed projects. Nevertheless, measuring performance in general may require looking at more than one attributes.

However, bringing together the two attributes (cost performance and project delivery time); project managers and researchers used them as a measure of success. Unlike [3] who looked success in different perspective, one piece of work published at Harvard business review by [10] argued that good project fails anyway. [10] proposal is to emphasize on the discussion how to improve or enhance the overall project performance. Similarly, [5] on his publication on the economist indicated that: although projects deemed/claimed a success, they sometimes fail to meet their targets. This may invite to the broader discussion to answer questions like what is success, what are the determinants of success, how can we measure success (e.g. by cost performance, delivery delay or something else like benefits after post-delivery?). However, it is important to understand that cost performance, typically cost overruns affect all project stakeholders [18] [19]. However, according to [3] definition of success, projects can be successful with cost underrun, cost overrun and at cost indifference.

In this research, we want to investigate two thematic research questions in connection to cost performance and project delivery:

1. Do longer projects have larger cost deviation than shorter construction projects?
2. If not, what really matter to be successful in construction cost performance?

2. Methodology

The research employed qualitative research method using basic statistical analysis. The road construction cost data are collected from Norwegian public road authority (16 projects) and few pilot projects (7projects) from building construction. Unlike a qualitative research method which is more subjective in nature, we use actual cost information and analyze them using statistical analysis, such as trend and line plot analysis. These provide unbiased results. However, we should acknowledge that more data should be added to reflect more realistic and reliable results.

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