EVALUATION OF DELIVERY PERFORMANCE FOR INTEGRATED INFRASTRUCTURE PROJECTS IN KUWAIT

Dr. Eng. Eisa A. Alsafran
Minsitry of Public Works -
A Chief Specialist Engineers

Introduction

The focus of this study is to explore integrated project performances. This research presented norms of (ΔC) and (ΔT) to be measured in three categories. The statistical data result of this study is beneficial to and supportive of the development plan of Kuwait as well as provides public client practical solutions. A quantitative method was adopted to achieve the purpose of this study, using a paper-based and on-line questionnaire survey to gather primary data. This paper focuses primarily on delivery performance of the construction phase as an essential part of the integrated projects and investigates a literature review on infrastructure provision in Kuwait, with a specific focus on integrated projects in construction procurement and implementation of various Integrated schemes. The word INTEGRATED has been formulated for this study which encompasses PPP, BOT, BOOT and DB projects. The exploration of the integrated infrastructure provision in Kuwait uses various implementations of emerging integrated schemes and examines two key factors: cost and time. Providing norms of the influential performance of integrated projects would boost the private sector's interest and potential involvement. It will also help the Kuwait public-client in integrated projects to identify and to evaluate its project performance and show Kuwait's public-client expectations of PPP project outcomes, among other integrated projects, through the norms of delivery performance. This will lead to a better understanding of dealing with private sectors in implementing the appropriate integrated schemes of the integrated infrastructure Projects in Kuwait.

Data Analysis

After collecting the required data, the next stage was the analysis of the participant's responses. 272 out of 375 public sector participants (72.5%) and 143 out of 181 (79.01%) private sector participants returned the questionnaire completed, so the response rate was highly satisfactory. A statistical analysis was employed to present the norms of Integrated projects and their performance of cost and time. The adopted method used a spreadsheet in Microsoft Excel to analyse the variations of each project of the study. The data was gathered by surveys, either paper-based

(Questionnaire Survey) or online-based (Survey Monkey). These projects were then segmented into four types of projects and the number of collected projects for each type was counted. Moreover, using the Relative Percentage Change equation (as shown in Eq. below) is to calculate the difference between initial and final cost and time of delivery performance to get (ΔC) and

(ΔT) in percentages. The initial and final cost and time of delivery performance were collected from participants. Graphs were produced based on the number of col-
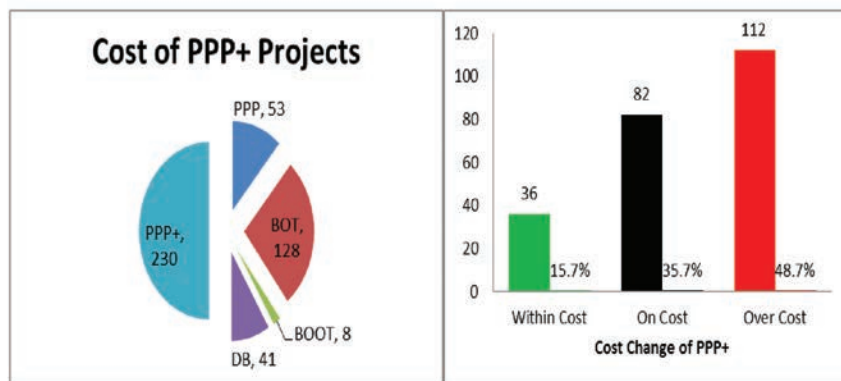
Figure 1: Overall (ΔC) of Integrated Projects

lected projects for representation and meaning.

$$RPC = 100 \times \frac{(Final - Initial)}{Initial}$$

The data collection results of cost and schedule integrated projects measured the variations within the four projects. The cost and schedule of integrated performance projects divided into three states of project assessment: within, on, and over. The first set of analysis examined the (ΔC) of integrated projects. An overview of the pie chart (Figure 1) shows that 230

integrated projects segmented to U53U PPP projects, 128 BOT projects, 8 BOOT projects and 41 DB projects. Overall, the (ΔC) of integrated (bar chart) shows that, out of U230U projects, 112 are over cost (48.7%), which means that a significant number of projects are exceeding the budget, with 82 projects on cost (35.7%) and 36 projects within cost (15.7%).

As shown in Figure 2, 22 out of 53 PPP projects were within cost (41.5%), 20 were on cost (37.7%) and 11 were over cost (20.8%).
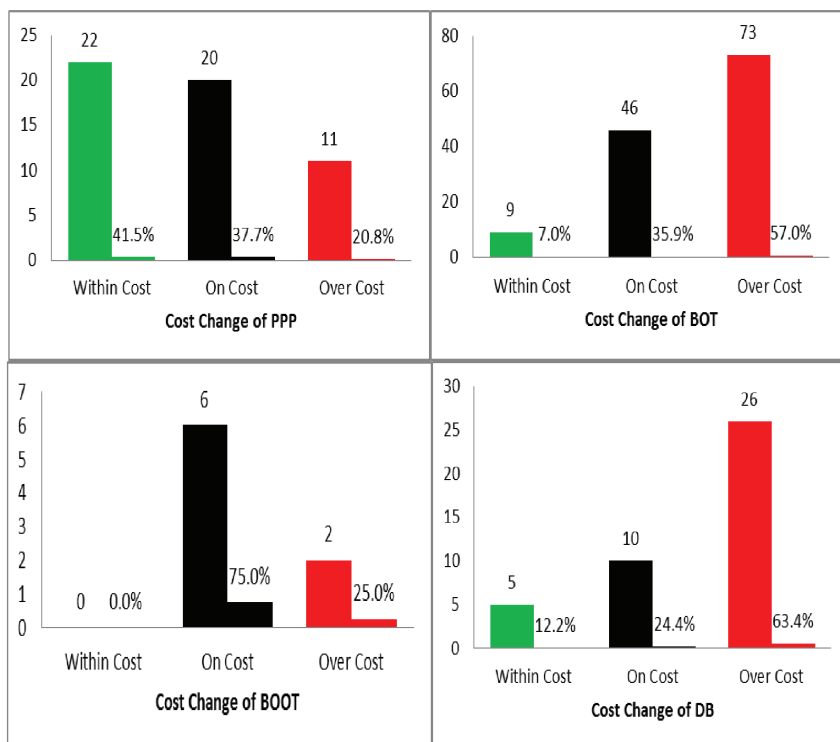
This clearly indicates that the most (ΔC) projects of PPP are within cost and on cost, with few over cost. BOT projects received 73 out of 128 for over cost (57.0%), 46 for on cost (35.9%) and 9 for within cost (7.0%). BOOT projects gained 6 out of 8 for on cost

(75.0%), 2 for over cost (25.0%) and 0 for within cost (0%). The small size of the BOOT dataset shows that on cost projects is significant of all. DB projects gained 26 out of 41 for over cost

(63.4%), 10 for on cost (24.4%) and 5 for within cost (12.2%). The interpretation of project performance in over cost shows that PPP has 11 projects (20.8%), BOT has 73 projects (57.0%), BOOT has 2 projects (25.0%) and DB has 26 projects (63.4%). This means that PPP and BOOT projects are the least likely projects to have over cost.

The second set of analysis examined the (ΔT) of integrated projects. A general review of the pie chart in Figure 3 shows that 229 integrated projects segmented to 51 PPP projects, 127 BOT projects, 10 BOOT projects and 41 DB projects. The bar chart shows that of integrated projects, 115 out of 229 projects are on-time (50.2%), meaning that most of the projects are completed to schedule. However, there is still a significant number of projects which are over time (93 projects or 40.6%) and the remaining 21 projects are within time (9.2%).

Figure 4 shows the (ΔT) for 51 PPP projects, 32 of which (62.7%) had on-time cost, 11(21.6%) recorded over time
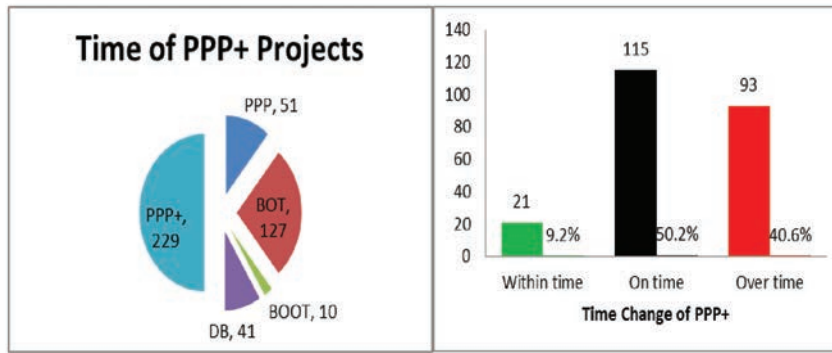

Figure 2: (ΔC) of Integrated Projects

Figure 3: Overall (ΔT) of Integrated Projects

Conclusion and Further Work

The evidence from this study encourages the government of Kuwait to proceed with their development plan and invite the private sector to invest and engage with the public sector, particularly in PPP construction projects. The results also encourage private sector engagement with the forthcoming PPP projects for developing infrastructure facilities. Further studies, regarding the role of integrated projects in Kuwait, would be worthwhile to explore rules and regulations, in dealing with the private sector. Also, collecting

cost and 8 (15.7%) showed within cost. In a total of 10 BOOT projects, 8 (80.0%) were on-time, whilst 2 (20.0%) were over cost. None (0%) of the BOOT projects were within cost. Statistically, it should be noted that this is a very small population. In 127 BOT projects, 60 (47.2%) were on-time, 55 (43.3%) were over time and 12 (9.4%) were within time. In 41 DB projects, 25 (61.0%) were over time, 15 (36.6%) were on cost and 1 (2.4%) was within cost. The schedule performance of projects indicates that PPP has 11 projects (21.6%), 2 BOOT projects (20.0%), 55 BOT projects (43.3%) and 25 DB projects (61.0%). This means that PPP projects are the least likely projects to have over time nevertheless for the on-time performance is significant as well as BOOT. PPP and BOOT projects have the least over time and over cost performance of Integrated projects. These results are particularly important for helping to enhance Kuwait's government stance, in attracting private sector for construction and infrastructure development in PPP form. It is interesting to note that in all four projects of this study, there is a significant number of on-time

and on cost projects. This suggests that there is progress in implementing Integrated projects, but a deficiency in project p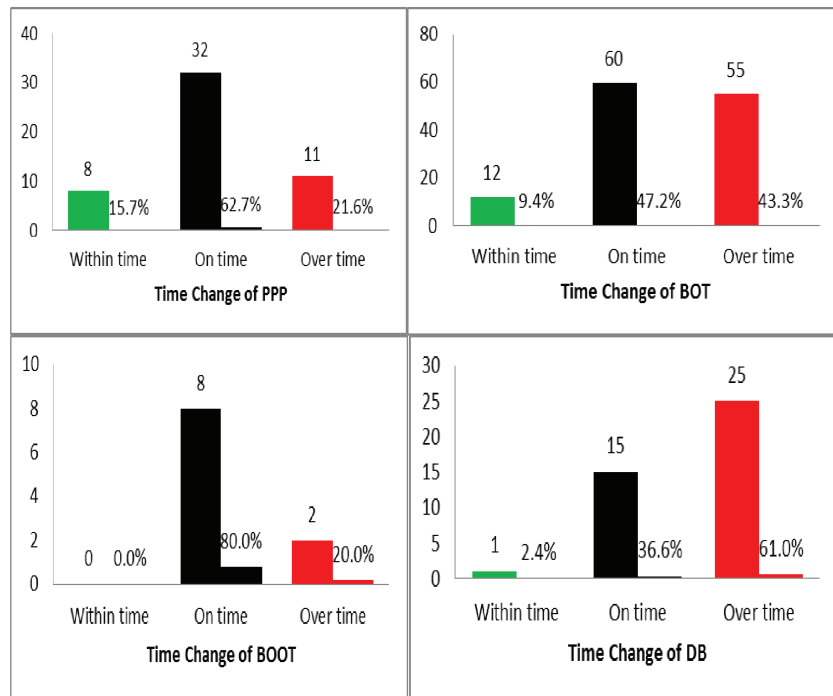erformance which needs to be addressed. Alongside other Integrated schemes, PPP and BOOT schemes are therefore anticipated to make a notable contribution to consolidate not just the Kuwaiti market and private investment schemes, but also the general development plan of the country.

Figure 4: (ΔT) of Integrated Projects

a significant number of Integrated projects to address the deficiency in project performance will lead to further investigation and exploration around the topic, something which is strongly recommended.