Why Construction Projects are delayed in PWA: Problems and Solutions

Dana Ahmad Al Marri
Public Works Authority, Doha, Qatar
d.ahmed.almarri@gmail.com

Noof Mohamed Al Kaabi
Public Works Authority, Doha, Qatar
nalkaabi@ashghal.gov.qa

Abstract

Construction is, by its nature, complex and uncertain. Changes and variations are inherently part of many construction projects, which require serious efforts to overcome. Project delay is a construction problem resulting in contractual claims, increased project cost, and decreased end-user satisfaction. This study investigates the root causes of project delay in Public Works Authority construction projects and gathers different perceptions on the causes of delay to propose a solution matrix that mitigate the effect of those delays and prevents its reoccurrence in future projects. A sample of over two-handed projects in 2021 have been granted an extension of time to its original completion date have been studied to identify and analyse the root causes of project delay and the risk relevant to the project delivery being prolonged. For these reasons, a categorization of delay has been adopted, and every cause of delay has been coded. The method adopted to identify the top root causes of project delay was the Pareto Analysis (Pareto analysis is premised on the idea that 80% of problems can be traced to 20% of the causes). The result of the study was the development of a holistic solution matrix to address the root causes of delay. The solution consists of two parts, (1) identify the relevant corrective, immediate and preventive actions, and (2) develop a responsibility matrix for the implementation of those solutions to ensure its governance.

Keywords: Construction projects; Delay; Cost; Problem Solution Matrix; Public Works Authority

1 Introduction

Delay in the project delivery led to additional cost associated with in direct cost (prolongation cost), additional consultant fees, disruption / Loss of Profit and the most critical impact related to the customer satisfaction. The objective of this study is to (1) identify major root cause of projects delays and to (2) propose the required actions to resolve the issue of project delays. To focus on delay causes related to the risk and responsibility of PWA result in Contractor's entitlement to bring forth claims for relief associated to the time for completion and/or additional costs.

The study was planned to be conducted in two phases as follows:

1. Phase (1) in 2022 focused on delay related to the authority (Public Works Authority) and other government agencies or end users
2. Phase (2) in 2023 cover the other causes of delay attributed to Contractor or other causes.

The reasons of limiting the scope on phase (1) to the Authority delay causes was because first it represents the controllable and internal causes compared to the other causes, and second it is the causes which leads to awarding extension of time completion to the projects.

2 Methodology

This section will present the steps taken to identify the issue of project delay and propose the necessary action to resolve it.

2.1 Classifying the Cause of Delays

The first step to identify the majors root causes to delay the projects by categorising the reasons of the delay using delay code. For that scholar exercises have been adopted such as the one presented by Lo *et al.*, (2006) which was further adjusted to fix the context in PWA. This exercise results shows the delay category presented in Fig. 1 below.

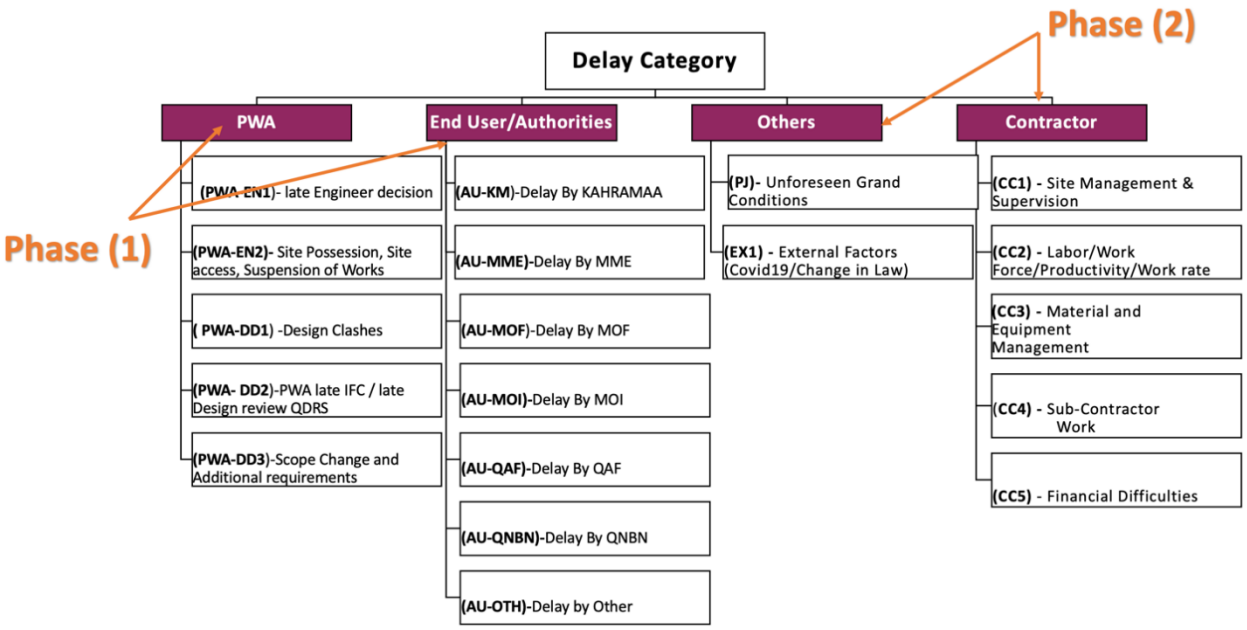

Fig. 1: Causes of Delay Categorization

It is important for delay category in PWA to have a common language used by all parties within the organization and in describing a particular delay. The delay category was discussed and agreed on during workshops which were conducted with project delivery departments.

2.2 Study the Existing Status

We will not be able to address a problem without the accurate diagnosis by analysing the available data which was the second step taken in this study. The diagnosis starts from determining the current situation based on data related to extensions of time (EOT) which was awarded to the construction contracts. The EOT issued by the competent department in PWA to construction projects in 2021 were approximately 200 No's, those EOT were analysed according to the agreed delay category. There are multiple reasons for project delays, 15 reasons, and it is, not possible, at a first stage to identify all of them. For that we used Perto chart to identify the fundamental reasons, which represent 20% of the reasons and have an impact of 80% on the problem as presented in the below chart.

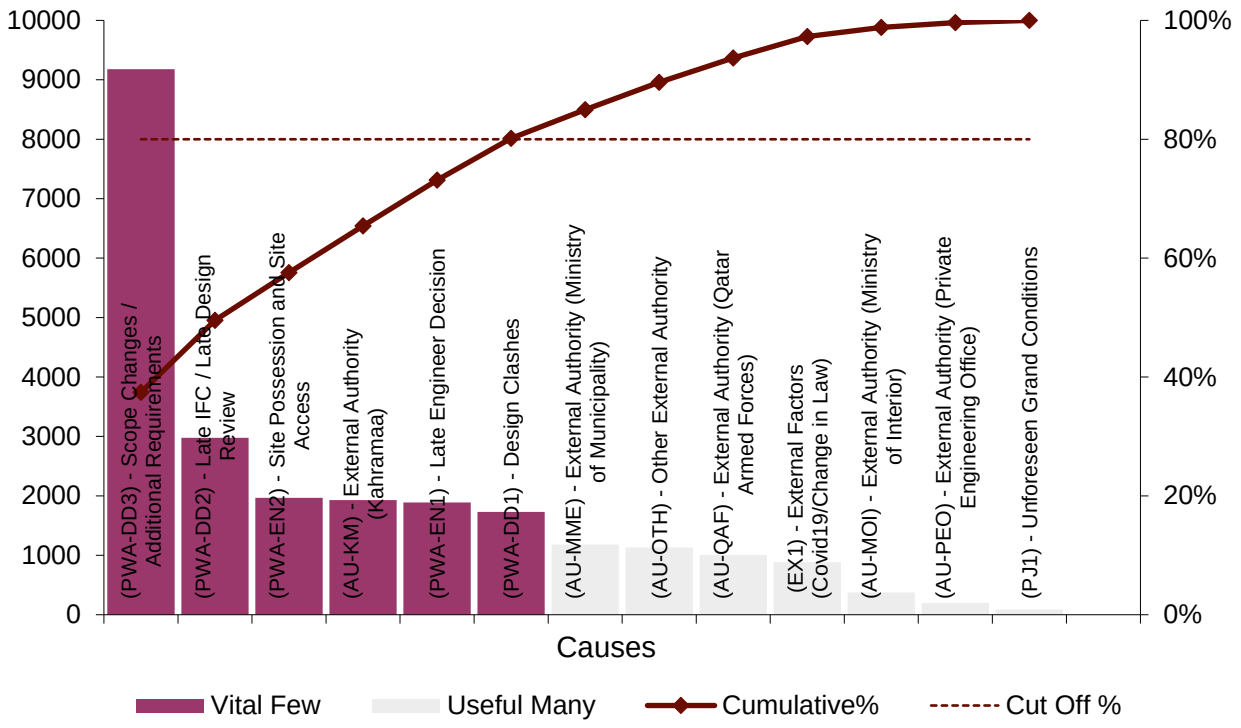

Fig. 2: Root Causes Pareto Analysis

The result shows that 6 delay reasons contribute to 80% of the problem, those delay causes are as follows:

1. (PWA-DD3) - Scope Changes / Additional Requirements
2. (PWA-DD2) - Late IFC / Late Design Review
3. (PWA-EN2) - Site Possession and Site Access
4. (AU-KM) - External Authority (Kahramaa)
5. (PWA-EN1) - Late Engineer Decision
6. (PWA-DD1) - Design Clashes

Changes in the scope of the project include, its requirements, and additional works amounting to approximately 40%, but are not limited to change in drainage strategy, adding additional network, change in construction method, switch from temporary to permanent roads and many others. The sound top cause is last issuance of issue for construction drawings and securing the relevant road opening permits.

2.3 Holistic Actions

As presented in Fig. 3 the action required to resolve the delay causes are split into three different forms of action, (1) preventive actions to eliminate the cause of the future potential delay, (2) immediate action to make the right and correct interventions that take place immediately to respond to the delay while occurring, and (3) corrective actions to prevent the reoccurrence of the delay in the future.

Fig. 3: Type of Action / Intervention

2.4 Development of Responsibility Matrix

There could not be one entity on the responsibility of projects delays, in PWA all affairs, departments, personnel take own responsibility to address the issue. For that as represented in Fig. 4 a responsibility matrix was developed for all the proposed actions. The responsibility matrix divides into five different roles for different entities towards implementing a specific action, those roles are (1) accountable, (2) responsible, (3) support, (4) consulted, and (5) informed. The importance of developing the responsibility matrix lies on the fact that they needed governance for the actions to be carried continuously to address the problem.

Fig. 4: Responsibility Matrix

2.5 Solution Implementation

Several workshops were conducted with different parties within the organization to come up with the actions required. Actions are visiting monthly for follow up and to make the necessary amendments if required.

3 Challenges

The main challenge which faces this study can be summarized as following:

1. Some proposed solutions are already on existing system such as the enterprise risk management and project charted application for which we must study what the existing system provides and not what the gaps are within that existing system. This does not address the issue on hand.

2. The development of the responsibility matrix was a bit challenging because it requires the management consent on taking some responsibilities and accountability toward the proposed actions.

4 Future Thoughts

Expand the scope of the study to phase (2) in 2023, and take into consideration literature in the matter that addresses the issue especially in terms of expectation of delay occurrence and avoidance.

5 Conclusion

Thank all of our colleagues for the support and collaborative work that was conducted for the purpose of this study and we are looking forward to much more collaboration in the future.

References

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