

# Causes and Effects of Delays in Construction Projects in the UK

## 1 Introduction

The purpose of this review is to ascertain the bank of research carried out to date on the topic of causes and effects of delays in construction projects in the UK.

### 1.1 Terminology

This research focuses on delays in the construction industry and the impact of such delays on project success: as such it is prudent to understand terminology such as delay and success in the context of this study.

#### 1.1.1 Success Criteria in Construction Projects

Mir and Pinnington (2014) point out that within the construction industry there is a myriad of project types and sizes, with different levels of uniqueness and complexity, which suggests that the criteria for success varies - as such there is no universal set of success criteria. Muller and Jugdev (2012) make a similar claim, maintaining that process success is multi-dimensional influenced by the perspectives of stakeholders and factors such as the type of contract. Mir and Pinnington (2014) add that success can be measured in terms of value to the client, a point that is reinforced by the Office of Government Commerce (OGC, 2007), which argues that success should be measured in terms of the value offered to the client. Walker (2015) maintains that success in the construction industry is defined in terms of a project delivered on-time, within budget and to the quality and functionality anticipated by the client/ employer. Fewings (2013) agrees, adding that the concept of success should be viewed from the perspective of the construction team and the end-user, where the former is likely to also consider success in terms of the end-user's satisfaction and commercial success in terms of profitability, whilst the end-user is likely to measure success in terms of functionality, comfort and operational costs over the life of the asset. Given this discourse, it is submitted that success equates to a project which adds value to the project stakeholders, measured in terms of time, costs, quality and profitability.

#### 1.1.2 Delay

Construction delay occurs when a project is executed later than planned, or delivered outside of the time specified in the contract (Haseeb et al., 2011). Fugar and Agyakwah-Baah (2010) make the point out that the causal factors in delays can be divided into two categories, namely internal causes and external causes. Gardezi et al., (2014) take the view that delays can be defined in terms of inexcusable delays and excusable delays, where the former are caused solely by the contractor and as such the contractor is not entitled to compensation for such an event and is also required to expedite the works and/or compensation the client for losses incurred due to

the delay. Kikwasi (2013) maintains that excusable delays can be further categorised as non-compensable delays and compensable delays. Non-compensable delays are generally caused by parties outside the project, or by events that are beyond the control of the project team, such as acts of God, unusual weather, fires or acts of government. In these instances, a contractor is entitled to a time extensions but is not entitled to financial compensation for delay damages. In contrast, compensable delays are caused by the client or the client's agent and include actions such as the late release of drawings. In short, an excusable, compensable delay typically results in an extension to the project schedule which in turn permits the contractor to claim additional costs from the client. Such a claim will include the additional indirect costs incurred by the contractor such as office overheads (Gardezi et al., 2014).

Fugar and Agyakwah-Baah (2010) argue that internal causes of delay are due to the primary stakeholders, including the client, the contractor and the designer. These delays can be controlled through effective management of the contract and the construction process. In contrast external causal factors such as weather cannot be controlled by the project team. The point is that delay is caused by a combination of factors, as such it is important to understand the underlying causes of delay from the internal and external perspective.

## 1.2 Underlying factors for delays in construction

There are several factors that contribute to the risk of delay in construction projects, including contractual relations, site conditions and the availability of resources (Haseeb et al., 2011). According to Doloi et al., (2012) the problem of delay can be categorised as client-led, designer-led or contractor -led. Muhwezi et al., (2014) make a similar differentiation, inferring that delay is typically a combination of these factors, given that for example design changes may lead to rework on site, creating a cumulative effect in extending the time taken to complete a project.

Client-led delays include practices such as late approval of drawings and method statement, slow payment of invoices, lack of agreement about key responsibilities in the contract and changes to the design data during the construction period (Doloi et al., 2012). Rosenfield (2013) adds that the client can also create problems which affect delays during construction by choosing unrealistic tender-prices and selecting the lowest price tender over value.

Contractor-led delays include poor financial management by the contractor and inadequate contractor's experience in activities/processes that are important to the physical completion of the built asset. Other factors include poor site management and delay in site mobilisation, which can be related to frequent changes during the construction process (Shehu et al., 2014). Khoshgoftar et al., (2010) agree that the contractor can be responsible for significant delays in a project if there is failure to control time and cost, a lack of quality control of workmanship leading to mistakes and rework, and failure to resource a project with sufficient materials and experienced labour.

The designer is also responsible for delays during the construction stage of a project's lifecycle, due to design errors, poor-quality management during the design process and inadequate site

investigation (Muhwezi et al., 2014). It is argued that in some instances, the client is in part responsible for these design problems, due to insistence on going to tender before the tender package has been completed in sufficient detail (Rosenfield 2013).

Khoshgoftar et al., (2010) conducted a detailed review of research on delays in construction and concluded that this problem is due to a combination of inter-related factors, such as ineffective planning and scheduling during the design and the construction stage, as well as poor resource management in the construction stage. Inadequate client finance can lead to delays in construction, particularly if this problem affects the client's ability to make payments on-time. A key underlying issue in delay causation is a lack of communication between the project parties.

### 1.3 Impact of these delays in terms of time, cost and quality

According to Abdul-Rahman et al., (2011), the impacts of delays in construction can be assessed in terms of the national impacts which adversely affect the industry's contribution to the economy and employment; at an industry scale, where delays affect productivity and profitability; and at a project scale where delays result in dissatisfied clients, low levels of profit and financial hardship for the contractor. Haseeb et al., (2011) take a similar view, insisting that at a project-scale, delay results in a loss of income for the contractor and potentially for the client, as the former experiences higher costs due to longer work time, along with increased labour costs. Fugar and Agyakwah-Baah (2010) take a similar stance, arguing that delays often lead to cost overrun, disputes and litigation. These factors result in loss and hardship for the client, with additional expense for the contractor in terms of the standby costs of workers and equipment.

Meng (2012) makes an important point, arguing that delay can affect willingness to communicate, which in turn affects the outcomes of the project and can lead to conflict and disputes. It is suggested that this is particularly important in an industry that is already fragmented through competitive tendering and the contractual nature of the project environment.

### 1.4 Mitigation measures used to reduce delays

Olawale and Sun (2010) take the view that delays and cost overruns are due to ineffective project control. There are several methods that can be used to control time, reducing the risk of delays, including the use of relatively basic techniques such as Gantt Charts, which offer a time related bar chart for project stakeholders. The construction industry also uses a process referred to as the critical path method (CPM), which unlike the Gantt chart takes account of the different elements of the work that are critical to completing the project on-time. There are also more sophisticated methods of time-control and management such as Technique, Performance Evaluation Review Technique (PERT) and Precedence Network Diagram (PND), as well as Elemental Trend Analysis/Line of Balance (LOB), and software packages such as Microsoft Project and Primavera. In short there is a host of processes available to the contractor to control time and optimise success. However there are multiple causal factors driving delays in construction: as such in addition to time control processes, a contractor needs to implement risk management

to predict factors which could affect the time taken to complete the project and to have measures in place to combat such risks (Iqbal et al.,2015; Zavadskas et al., 2011). In addition, the preceding section highlighted the impact of change during construction on delays, and as such it is argued that a contractor should have a change management process in place to quantify the impacts of change prior to implementing such change (Bröchner and Badenfelt 2011; Shen et al., 2010).

### 1.5 Summary

In summary it is suggested that delays in construction are driven by a range of factors including client, designer and contractor-led issues. The impacts of these delays include loss of profit, productivity and reputation - as such this problem requires attention. It is submitted that there are processes available to a contractor to mitigate such problems including risk, value and change management, which offer the potential to control the internal and external factors driving delays.

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