An Investigation into whether Building Information Modelling (BIM) can Assist with Construction Delay Claims

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ABSTRACT

It is probable that a construction project anywhere in the world will encounter some form of delay as a consequence of change. The impact of the delay on a project will vary, but it is likely to have a negative financial outcome. Compensation can be requested by an affected party in the form of a claim; however, issues of liability and quantum can be difficult given the ever increasing complexity of construction work involving numerous differing successive parallel tasks with varying levels of interrelated resources. Experts are often employed to analyse delays based on project records and report their findings to a tribunal. This paper identifies the difficulties associated with the retrieval and representation of information for delay claims and recognises technological opportunities to deal with these challenges. The potential to exploit aspects of BIM to support these possibilities are discussed, concluding that it can assist through the ease of access to coordinated contemporaneous project information and the use of visualisation through multiple dimensions. In order to support this initiative a detailed review of the literature is undertaken which forms part of an Engineering Doctorate.

Keywords: Building Information Model, Claims, Construction, Delay, Disputes, Visualisation

DOI: 10.4018/ij3dim.2013010105
**INTRODUCTION**

The construction lifecycle is a complex endeavour which incorporates multiple parties to undertake numerous tasks each with varying levels of interrelated resources. The risks associated with construction projects are high and are not supported by the small profit margins that exist. If nothing was to change on a project it would be completed to the planned cost, quality and time; however, even the best laid plans will deviate. Reports show that a trade-off between these elements is likely, with over a third of projects not being completed to the planned time and cost (Egan, 1998). Organisations cannot financially absorb this difference; therefore, the affected party can claim compensation. In order for a claim to be made for time delays, a delay analysis must be undertaken.

Currently, no research has been undertaken to investigate whether elements of BIM can be exploited to support construction delay claims. To bridge this gap, this paper explores both construction delay and BIM literature. The fundamentals of delay analysis are explained and some of the challenges encountered by analysts are discussed. Potential technological opportunities to mitigate these challenges are identified, and a connection to some of the benefits related to BIM are realised and discussed.

**DELAY**

The term delay is exhaustively used in the construction industry; however, no standard form of construction contract defines the term due to the comparative nature in which it is used (Pickavance, 2010). For the purpose of this paper, delays are referred to as an unanticipated extension to the overall planned time period and/or the incident which prolongs the duration of an activity without affecting the overall project duration (Bramble, 2000). Therefore, the process of analysing delays can be viewed as the forensic investigation into an issue which has caused a time overrun (Farrow, 2001). This is distinctly different from disruption, a term generally conjoined with delay, which is the loss of efficiency due to low productivity or an interference with progress (Cooke, 2009). The topic of disruption is not considered in this paper; however, both delay and disruption can result in a claim and some of the discussion may be transferable.

**Categories of Delay**

Subject to the claiming party, different forms of compensation can be requested depending on how the delay is classified. In order to analyse delay, the first step is to decipher responsibility by categorising whether the event is excusable or non-excusable.

Non-excusable delays, also known as culpable delays, contractor delays or inexcusable delays (SCL, 2002), are delays within the contractors control; thus, they assume responsibility for the delay and its impact on the other parties (Bramble, 2000). In contrast, excusable delays, also known as non-culpable delays and employer delays (Cooke, 2009), are delays beyond the control of the contractor which allows them a form of compensation. The compensation available will depend on whether the event is deemed compensable or non-compensable.

Under a non-compensable event the contractor can obtain an extension of time which provides the contractor with an extension to the agreed contract completion date and acts as a mechanism to protect the client’s entitlement to liquidated damages. If the delay event is deemed compensable the contractor can claim loss and expense, but they must prove the damages they have suffered from events not their fault. A combination of both forms of compensation is also possible.

The client can claim compensation in the form of actual damages or liquidated damages. Actual damages are calculated post delay and must be proven, whereas liquidated damages are included in the contract as a pre-estimate of
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