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## Delay Analysis Methodologies (DAMs) in Delivering Quality Projects: Contractors and Consultants’ Perceptions

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### Abstract

The paper attempted to identify the current practice on the use of Delay Analysis Methodologies (DAMs) and the challenges affecting its use during practice in view of delivering quality projects. A questionnaire survey approach was employed among key players during the data collection of the main research. An extensive literature search has also been conducted during the initial stage. The survey outcome revealed that DAMs reported in the literature comprises major weaknesses, although they are being widely used in practice. This is due to deficiencies in the skills of players during the implementation of techniques, programming and record keeping practices.

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**Keywords:** Construction delay; delay analysis methodologies; contractors; consultants

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## 1. Introduction

Delays have been found to be the most cited as a major source of construction claims and disputes on the time extension in construction projects (Iyer, Chaphalkar, & Joshi, 2008; Yusuwan & Adnan, 2013<sup>a</sup>). According to Palaneeswaran & Kumaraswamy (2008), delays often result in either liquidated damages or time extensions and associated claims for extra costs. Delay situations are complex in nature due to (a) a delay in an activity may not result in the same amount of project delay, (b) a delay caused by a party may or may not affect the project completion date and may or may not cause damage to another party, (c) a delay can be caused by more than one party; however, it can also be caused by none of the parties (such as unusually severe weather conditions), (d) a delay may occur concurrently with other delays and all of them may impact the project completion date, and (e) a delay sometimes contribute to the formation of other delays (Arditi & Pattanakitchamroon, 2006). Therefore, the realistic assessment and effective management of delays and time extension claims is a complex and difficult activity for many contracting parties (i.e. clients and contractors) and their advisors, e.g. consultants (Palaneeswaran & Kumaraswamy, 2008).

Yusuwan & Adnan (2013)<sup>b</sup> found that “concurrent delay,” “eligibility of a time extension claim,” and “non-compliance with contractual requirement,” were the top three (3) disputed issues in Extension of Time (EoT) claims. This is in line with Danuri, Othman, Abdul-Rahman, & Lim (2006) who stated that local contractors usually fail to comply with the contract procedural requirements to submit timely notification of delay and have difficulty in demonstrating their entitlements for EoT. Moreover, Chong and Leong (2012) in their study into the contractor’s entitlement to EoT from the case studies in Malaysia revealed that both cases were weak in terms of the entitlement for EoT due to the issue of concurrency of the delaying events and the lack of accuracy of the work programme. In addition, Palaneeswaran & Kumaraswamy (2008) stated that disputes on the time extension for delays often arise from disagreements on (a) eligibility of a delay event for claiming EoT, (b) choice of method for evaluating EoT, and (c) quantification of the EoT or permissible period time extension. The entitlement to EoT is not simply a matter of preparing a list of the delaying events in a project; rather, the contractor must prove both how the listed events caused the so-called delay or impact and the corresponding duration of disruption of a valid critical path (Chong & Leong, 2012). Therefore, various DAMs are available for determining relevant time extension durations, demonstrate the impact on the critical path, and establish entitlement to a time extension (Palaneeswaran & Kumaraswamy, 2008; Yusuwan & Adnan, 2013<sup>a</sup>).

According to Palaneeswaran & Kumaraswamy (2008), the ‘eligibility checking’ on time extension claims includes confirmation of ‘validity in principle’ against ‘specific checks for eligibility’ which is either the delay causes makes other activity/activities on the critical path at that point of time. Supported by Zafar (1996) the most important aspect of delay analysis is to find the cause of the delay that affected the critical path and consequently the completion of the project. In construction contracts, schedule delay analysis is commonly conducted to demonstrate cause and effect relationships of time-related disputes (Arditi & Pattanakitchamroon, 2006). Therefore, the task of investigating the events that led to project delays for the purpose of determining the financial responsibilities of the contracting parties arising from the delay is referred to as “Delay Analysis” (DA) (Brahmah & Ndekugri, 2009). Various DAMs are available for undertaking delay analysis and quantifying the duration of time extensions to reduce the difficulties and disputes on EoT claims resolutions. However, Braimah & Ndekugri (2009) stated that very little attention has so far had given to the question of how practitioners view these methodologies in practice in terms of their usage. Hence, this research reports on the current practice on the use of DAMs and the problems affecting the use of these methodologies in delivering quality projects in the Malaysian construction industry.

## 2. Literature review

### 2.1. Overview of existing DAMs

According to Palaneeswaran & Kumaraswamy (2008), the selection of a suitable DAMs often varies according to the experience and preferences of the contracting parties (i.e. clients/owners and contractors) or their consultants.

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