The Best Practices in Delay and disruption analysis in Iraq's construction sector

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ABSTRACT Delay and disturbance analysis (DD) is a significant cause of claims and conflicts in the Iraqi building industry, frequently resulting in time and expense overruns. The extent to which each contracting party is responsible for the postponed job execution and additional expenses incurred is often at the heart of the dispute. Various methodologies have been developed over time to answer this question. This research was undertaken using a mixed-method approach, which involved a detailed examination of the related literature first. Due to programming and record-keeping shortcomings, the primary finding is that DD testing methodologies with major defects in the literature were the most widely found in use. To encourage the use of more efficient methodologies that ensure greater efficiency, a scheme integrating best practice recommendations for promoting better record-keeping and programming practice has been established efficient claims settlement with fewer chances of conflicts.

1. Introduction

The construction projects in Iraq are frequently known as successful when it is accomplished at the particular time, within budget, and in uniform with the specifications. Delay and disruption are Building industry endemic and contribute to time and cost overruns. Consequently, it is important to detect delays and/or disturbances early so that corrective steps can be taken. However, when delay and/or disruption occurs, the problem of quantifying the delay time, the disruption consequences, and quantifying the resulting in loss is complex.

All types of construction projects are all subject to completion dates, whether they are basic home buildings or multistoried flat houses or civil engineering tasks. Despite the most advanced project management strategies, however, construction projects in Iraq often struggle to reach deadlines, causing delays and disruptions. The most common delays and disturbances are and the most expensive issue on construction projects worldwide.
2. UNDERSTANDING DELAY AND DISRUPTION

2.1 Delay

The words "delay" and "disruption" are often used connected nearly as if they are the same thing. Be that as it may, they are two distinctive marvels, and most will have a few people who comprehend what a delay is indeed even though there's not the precise definition in connection to development and designing ventures. Delay is a verb that means to wait implies:

- To arrive late or slowly at (someone or something): the project's completion was postponed due to an inclement ride out.
- Elect delayed or sluggish; to linger: the service provider couldn't wait any longer to begin the excavation.
- They decided to cancel or pause the drilling until the conditions improved.

Delay is a noun that means:

- A time frame within which anything was suspended or rescheduled: a 5-hebdomad delay; lengthy delays in putting the formwork together.4
- Anything that causes a late, delayed, or deferred action: the cause of the delay was a shortage of steel fixers. A pause must be matched to something to make sense.

The most comprehensible comparison is the original timetable, which was intended before any delays or a fixed deadline existed. Consider the following example:

- A postponement of the contract's completion date.
- The launch of ‘brickwork’ has been postponed.
- The construction of ductwork is taking longer than planned.

2.2 Disruptions

In construction, the interruption of the construction cycle by an event(s) is referred to as disruptions. can be some event which prevents the contractor from not fulfilling the work as planned or recommended 5, The Society of Construction Law (SCL) defined the disruptions as “a stumbling block, a stumbling block, or an interruption to a Contractor's regular job flow, As a consequence, productivity suffers. or lower productivity than would otherwise be achieved”.6

Distractions affect delay and delay acts as disruptions. They both muddle up the project as they both impact one another.

Popular delays to construction projects arise from workflow intrusions. In complex projects, at the bid stage, many disruptions are planned for which may be anticipated to appear during the project. For instance, And when all goes well, a degree of rework is always required because both the contractor and the customer will still make mistakes.

Disruption of construction work may, but not necessarily, contribute to the late completion of the work. In this case, [the contractor] would not be able to make an EOT argument. 7 However, it will be eligible to make an argument about the expense of the ride. decreased productivity of its staff.

What are the illustrations of disruption in the construction and engineering industries, Weather, the material lacks and labor disputes are all sources of serious disruption in the construction industry. The building industry often addresses interruption as if it were the same as delay (Us and Next, 2020). It's usually used in conjunction with the word "wait," as in "delay and interruption." The terms "delay" and "disruption" are not interchangeable. They have the same meanings as they do in real life. Delay is the state of being late (e.g delayed completion equals late completion). Disruption is described as a lack of production or a state of disorder, difficulty, or interruption of making progress.

From the construction perspective, unsettled work is frequently a job that is completed with a reduction of efficiency than it would have been had it not been for the trigger of disruption.8
2.3 Causes of Delays and Disruptions

Unfortunately, it can also be argued that there is no consensus about what constitutes a major cause for delay, resulting in researchers having a varied perspective on the topic.\textsuperscript{9} The consequence that sounds for an appropriate period executive in particular removing all means of delays and disturbances is done within a defined time frame.

- A report by Kumaraswamy and Chan (1998) on the causes of building delays in Hong Kong showed that different classes of construction and civil engineering participants have different perceptions of the causes of delays. They hypothesized that separate business groups' interests could apportion blame for delays to other parties.
- At (1999) investigated the causes of road construction delays in Thailand and concluded that delays can be caused by all project stakeholders; however, the main causes are insufficient subcontractors, organizations without enough funding, unfinished and unclear drawings, and deficiencies between consultants and contractors.
- Al-Momani (2004) investigated the causes of delays in 130 public projects in Jordan and discovered that planners, consumer shifts, temperature, site conditions, late completion, economic conditions, and increased quantity were the primary causes of delays.\textsuperscript{10}
- According to Al-Kharashi and Skitmore (2008), the lack of professional and trained staff is the major cause of delays in Saudi Arabia's building division for public projects.
- The ten most important triggers in Florida, according to Ahmed, Azhar, Castillo, and Kappagantula (2002), are building authorizations approval, variance orders, changes in drawings, incomplete records, approvals, changes in requirements, decision during the progress stage, and shop drawings and approval.
- Contractors' unsuitable preparation, contractor's poor site management, insufficient contractor expertise, inadequate client funding and compensation for completed work, issues with subcontractors, shortage of inventory, labor availability, equipment accessibility and breakdown, and lack of coordination are the ten most important causes of delay in the Malaysian construction industry, according to Sambasivan and Soon (2010) between parties, and slipups during the construction period.\textsuperscript{10}

Other researchers looked at the reasons that cause building projects to be delayed.

- Poor risk control and tracking, uncertain situations at the venue, slow decision making, variations introduced by the customer, and variations in function are five main delay factors, according to Chan and Kumaraswamy (2015). Additional delay causes were found in an analysis by Kaming and Olomolaiye.
- Cost and time overruns are the subject of Holt and Harris (2017). According to the report, material cost increases due to inflation, erroneous material calculation, and the degree of complication are the most significant factors driving cost overrun.\textsuperscript{11,12}

| S\# | Author(s)                     | Category (regional, project, etc.) | No of the causes identified |
|-----|-------------------------------|------------------------------------|-----------------------------|
| 1   | Asmaa Jebur Jasim             | Iraq                               | 48                          |
| 2   | Abd El-Razek et al. 2008      | Egypt                              | 32                          |
| 3   | Doloi et al 2012              | India                              | 44                          |
| 4   | Faridi and El-Sayegh 2006     | UAE                                | 45                          |
| 5   | Gunduz et al 2015             | Turkey                             | 83                          |
| 6   | Enshassi et al. 2009          | Gaza                               | 110                         |
| 7   | Sanni-Anibire 2020            | France                             | 46                          |
| 8   | Chen, Gui-Xiang 2019          | China                              | 55                          |
| 9   | van Seijen, Maartje 2019      | Austria                            | 73                          |
3. RECOMMENDED FORENSIC SCHEDULE ANALYSIS PRACTICES AND STANDARDS

Many professional groups have shown interest in Delay and Interruption Research over the past few decades by designing recommendations, suggested protocols, and other resources, and criteria aimed at facilitating simpler contract terms about float ownership, concurrent delays, and methods to decide which are the Best Practices.

Compensation and an extension of time There are Two major timetable guidance materials available right now.

3.1 Recommended Practice 29R-03, AACEI, USA

Persistence of The aim of the project was to “stipulate an integrated, traditional guide for the forensic submission of CPM preparation to strengthen, if not eliminate, confusion among experts about forensic scheduling terms, definitions, and techniques.”13, The desired outcome is to ‘reduce the amount of needless technical implementation conflicts and encourage consultants to focus their expertise on settling questions over substantive issues. The RP was first released in June 2007, and it was updated in June 2009 and April 2011. (Sanders, 2012). The SCL Protocol is likely to have had some influence on the RP, even if only as a reference text. The RP states 13: "The ‘Delay & Disruption Protocol,’ published by the Society of Construction Law of the United Kingdom in October 2002, is the only other related protocol recognized at this time. This RP’s spectrum is narrower than the DDP’s.” Once more, reflecting the character of the drafting subcommittee and the U.S. base of the AACEI, the Protocol is somewhat U.S.-centric, and at the same time as The bulk of the text reflects appropriate procedure at the time of publication; however, the legal standards guiding some of the guidelines may not be valid to all dominions.

The Etiquette concludes with two appendices,
A. Terminology association thinks
B. forensic schedule research taxonomy.

3.2 Delay and Disruption Protocol, Society of Construction Law (SCL), UK

In 2002, the United Kingdom Society of Construction Law (SCL) first published its Delay and Interruption Protocol (the 'Protocol') to guide a few of the most basic problems affecting a project when determining time extensions or reimbursement for delays. The Protocol is not legally binding unless it is integrated into the contract (which is rare), but has been used as instructive in resolving common problems of delay and interruption in the UK and internationally. The SCL released an updated second edition (the 'SCL Protocol') in 2017 following market input, case law developments, and technological advances since it was the first released6. The SCL Manual contains 22 Basic Principles, as well as more detailed guidance on definitions, generic terms, financial claim heads, and records. It notes that it is anticipated to be a collaborative detail that represents the interests of all organizations involved in the construction process and strives to be compatible with good practice, as opposed to providing a guideline for best practice.

The Decorum is intended to afford valuable feedback on some of the Popular problems of delay and disruption occurring in construction contracts in which one side seeks an extension of time (EOT) and/or compensation from the other for the extra time and money used to complete the project 14. The object of the Protocol is to furnish the parties with a means to settle these affairs and to prevent needless disputes.

As per above, we can make a compression between the two main protocol as below:

| SCL Method                | AACE Method                           |
|---------------------------|---------------------------------------|
| As-Planned versus As-Built| MIP A Observational/ Static/ Gross    |
|                           | MIP B Observational/ Static/ Periodic |
|                           | MIP C Observational/ Dynamic/ Contemporaneous/ As-Is |
4. In what conditions do you use which technique?

Determining which technique is the most suitable is a highly subjective activity because even though the parties agree, the execution of the same "technique" often differs to the point that neither side can acknowledge the other's conclusions. Both the SCL Protocol and the RP-FSA have discussed these problems. Both offer advice on the considerations to consider when deciding which strategies are best for a given situation. Table (3) summarizes these points. It's no surprise that the reasons in each paper are identical.

| MIP D | Observational/ Dynamic/ Contemporaneous/ Split |
|-------|---------------------------------------------|
| MIP E | Observational/ Dynamic/ Modified or Recreated |
| MIP F | Modeled/ Additive/ Single Base               |
| MIP G | Modeled/ Additive/ Multiple Base             |
| MIP H | Modeled/ Subtractive/ Single Simulation       |
| MIP I | Modeled/ Subtractive/ Multiple Base           |

### Table (3) Factors for choosing an appropriate delay analysis technique

| **SCL Protocol** | **AACEI RP-FSA** |
|------------------|------------------|
| the relevant conditions of the contract | contractual requirements |
| the nature of the causative events | purpose of analysis |
| the value of the dispute | source data availability and reliability |
| the time available | size of the dispute |
| the records available | the complexity of the dispute |
| the program information available | budget for forensic schedule analysis |
| the programmer’s skill level and familiarity with the project | time allowed for forensic schedule analysis |
| | the expertise of the forensic schedule analyst and resources available |
| | forum for resolution and audience |
| | legal or procedural requirements |
| | history/methods and what method the other side is using |
5. CONCLUSIONS

This paper presented recommendations for a more reliable evaluation of delay and interruption analysis using a range of situations that can apply to Iraqi construction projects.

A contract administrator cannot require a highly sophisticated type of analysis where a simpler type of analysis would suffice.

This presumption of evidence must be fulfilled. After all, if the case goes to court, it is against the balance of probability of dispute settlement proceedings.

The argument's merits will be tested here it fair to expect a comprehensive investigation (which would almost certainly have to be based on thoroughly detailed and logic-related data). When only a few specific programs are used in Iraqi building projects, the contract has issued and reviewed the programs, and the administrator is unconcerned about the quality and content of their work.

The SCL and AACEI Protocols also stress the importance of a proportionate approach to delay analysis, as shown by paragraph 11.3 Guidance on Core Principles in the SCL Protocol and paragraphs 5.4 and 5.5 in the AACEI Protocol.

There is a case study it is DAMAC Villas Construction Project in Baghdad. It is one of the biggest building projects in Iraq. The project was built on a surface area of 12 million m² in Baghdad. The project consists of 25 buildings and 36000 residential complex villas. Since June 2018, the project has been operational. The contractor submitted several claims during the project due to major delaying incidents, such as the modifications of the owner causing abortive work, the late approval of major long lead products, and the alteration of the design of the staff villa causing suspension of the development, delivery, and installation of precast villa units.

This analysis may fall primarily within the framework of MIP 3.7, as it is a model, additive, multi-base type of analysis. However, due to the vast number of activities included in the plan (i.e. almost 85,000 activities), adjustments were made to simplify the study. The analyst preferred a combination of fixed and variable periods to be used for Via the use of fixed two-month and two four-month cycles, referred to in phase 2. While such a hybrid usage is not defined in the RP, stepped insertion could be the approach (MIP 3.6) since this study was implemented while the project was underway. The analyst applied a combination of retrospective (because of delay events that had already taken place) and prospective TIA5 (because of delay events that are predicted or yet to be encountered) modes of review and not retrospectively after the project was completed.

Although recognizing that some of these differences could be due to the delay analyst's biases and interactions regardless of area, this paper shows that selected projects from the MENA region, which were chosen as a representative sample from the authors' experiences with other projects in the region, still find the windows analysis and time effect analysis methods useful.

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