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ASSESSING DELAY CLAIMS IN TERMS OF EXCUSABILITY AND CRITICALITY OF DELAYS IN FIDIC BASED CONTRACTS

Eranga Jayasena[1] and U. Kulatunga[2]

ABSTRACT

Assessment of delays involves complex decision making. Most standard contract forms do not provide guidelines on assessing delay claims; this is left to the professionals who at times tend to make decisions based on experience and subjective judgement. This will not always guarantee consistent decisions. Therefore, there is a need for a mechanism for assessing delay claims in construction industry. Excusability and criticality are the two elements to be considered in assessing a delay. These are governed by the conditions of contract and adopted delay analysis techniques (DATs) respectively. This paper is focused on developing a holistic approach to support the assessment of delay claims in terms of assessing the excusability and appropriateness of DATs. A mixed method approach was adopted for this study with four phases namely; literature review, desk study (based on FIDIC 1999 red book), in-depth expert interviews and a questionnaire survey. Qualitative data obtained through interviews were analysed using content analysis and questionnaire survey findings were statistically analysed. According to the findings, there are 18 major sub-clauses giving rise to excusable delays under FIDIC 1999 red book. In assessing the excusability of delays, the notice requirement, concurrency of delays and the contractor's obligations of mitigating delays are the important aspects to be considered. In the assessment of criticality, window analysis is the most suitable DAT. However, due to the complexity of the window analysis method, as planned vs. as built method is most commonly practiced in the industry which is considered as simple but less accurate.

Keywords: *As Planned vs. As Built; Criticality; Delay; Excusability; Window Analysis.*

1. INTRODUCTION

Claims management is considered as one of the greatest challenges for project stakeholders due to the complex and uncertain nature of construction projects (Amarkhi et.al, 2021). As per Vidogah and Ndekugr (2007), there is tremendous scope for improving claims management practice. This is because; claims management is still performed in an ad-hoc manner, contractors' management information systems are ill designed to support claims and records are often being inadequate even if available. Delays and disruptions to contractors' progress, often resulting in time and cost overruns, are a major source of claims and disputes in the construction industry (Ekanayake & Perera, 2016; Braimah, 2008; Sudeha et al, 2013). Various analytical methodologies have

[1] Research Assistant, Department of Building Economics, University of Moratuwa, Sri Lanka, ecjayasena@gmail.com
[2] Professor, Department of Building Economics, University of Moratuwa, Sri Lanka, ukulatunga@uom.lk

been developed over the years as aids to determine the extent of the delay, but hardly any information is available in terms of a holistic approach or procedure to guide practitioners in the assessment of delay claims (Braimah, 2008). Further, majority of contractual regimes do not provide details of the principles governing the assessment of delay claims; this is left to the professionals involved in each project (Kumaraswamy & Yogeswaran, 2007, Croeser, 2010). Banwo et.al (2016) mentioned that assessment of delays involves complex decision making. Conventionally, decision makers tend to make decision based on a blend of their intuition and subjective judgement. This kind of practice does not always guarantee consistent decisions and could be bias. Therefore, there is a need for a mechanism for assessing delay claims in construction industry (Iyer & Banerjee,2001).

There are two major factors to be considered in assessing a particular delay for granting an extension of time. These are: (a) whether the delay is excusable and (b) whether the delay is critical (Ndekugri & Braimah, 2007). Among these two elements, excusability of a delay is mainly be determined by the conditions of contract agreed between the parties while delay analysis techniques (DATs) are used in establishing the criticality and the quantum of delay (Braimah, 2008; Ekanayake & Perera, 2016). However, there are only few previous studies on this topic related to the Sri Lankan construction industry. In the literature, selection of appropriated DATs has been discussed in the recent studies of Dulaimi et al, 2018; Arditi and Pattanakitchamroon, 2018 and Andian et al, 2021. However, not much literature is available in considering both criticality and excusability of delays in assessing delay claims. Hence, the aim of this research is to develop a holistic approach for assessing delay claims in terms of excusability and criticality of delays in FIDIC based contracts. This study is limited to FIDIC 1999 red book due to its prominent usage and the familiarity within the context where research data is collected.

2. LITERATURE REVIEW

2.1 DELAY/EXTENSION OF TIME CLAIMS

Majority of projects overrun the stipulated completion dates. This can be attributed to the nature the uncertainties surrounding building and civil engineering projects (Andian et al, 2021). As such most standard forms of contract permit the extension of completion date where certain stated events tinder the control of or beyond the employer (Alnaas et al, 2014; Murdoch et al., 2015). Alternatively, where the event causing delay is one in the control of the contractor, he suffers damages usually liquidated as stated in the contract (Murdoch et al., 2015; Ndekugri & Braimah, 2007). Delay (extension of time) claims are the most common claims because it is faced by each contractor in almost every construction site (Bordoli & Baldwin, 2008; Braimah, 2013). According to Enshassi and Jubeh, (2020), delays in construction projects are contemplated as one most crucial issue that is being suffered by the current construction industry. Furthermore, Arcuri and Hildreth (2007) stated that construction delays are generally recognised as the most complex, risky and costly matter encountered in construction projects.

An extension of time is not deemed eligible or permissible unless all the causes of the delay are determined and evaluated then check to whether or not the reason is valid for extension of time request as per the contract clauses (Croeser, 2010). After the Contractor evaluates the reasons and causes of the delay and their eligibility for an extension of time; he determines the quantum of time and addition time needed, he then submits the claim into the employer (owner) or his representative (Architect, Engineer or Consultant)

(Murdoch et al., 2015; Ndekugri & Braimah, 2007). Although the reason and causes of an extension of time claim is unique and different for each construction project, the lifecycle and the stages of which the extension of time passes through is typical (Kumaraswamy & Yogeswaran, 2007)

2.2 TYPES OF DELAYS

Evaluation of construction delay claims is, to a large extent, influenced by the type of delay (Ndekugri & Braimah, 2007). A number of studies have attempted to categorise delays in terms of the impact, risk and cause of the delay. An in-depth understanding of the different types of delays is essential for the successful execution of delay-claim analysis.

2.2.1 Excusable and Non-Excusable Delays

An excusable delay can be described as a delay caused by either the client or the client's agents and third parties or incidents beyond the control of the client and the contractor, (Ndekugri & Braimah, 2007; Paray & Kumar, 2020). These culminate into a claim as they impose disruption and delay, as well as, loss and expense to be incurred by the contractor (Ndekugri & Braimah, 2007). A non-excusable delay is defined as a delay caused by the contractor, or any aspect that is within the contractor's sphere of control. The contractor would not be entitled to any additional time or compensation for this type of delay (Paray & Kumar, 2020).

2.2.2 Concurrent Delays

A concurrent delay occurs in a project when more than one type of delay arises at equal time frame and both, either independently or together, which impact the critical path of the project (Menesi, 2007). Subsequently, Paray and Kumar (2020) defined concurrent delay as a delay that is caused by entirely distinct parties at the same time which may impact the completion date of the project. The widely accepted rule in the construction industry is that if delays caused by the owner and the contractor occur simultaneously, last an equal amount of time, and have an equal impact on the critical path to project completion or another milestone date, neither party is entitled to compensable delay damages and neither party is entitled to its actual delay or liquidated damages, unless a specific contractual clause states otherwise {The Society of Construction Law (SCL), 2017}.

2.2.3 Critical and Non-Critical Delays

According to Andian et al. (2021), a delay in progress is not the same as a delay in completion. A delay in progress is a significant shift in the planned timing of a specific activity or activities that could occur at any time. Although the start and/or finish of the activity might differ from the original intent, it is irrelevant, unless it ultimately impacts on the completion date. On the other hand, a delay in the completion date occurs only when the completion date has passed; this can only be caused by a delay to the progress of an activity, which is in the critical path to completion (Croeser, 2010). A critical delay is a delay on the critical path of the project, resulting in the final completion date of the project being delayed, and a non-critical delay is a delay that is not on the critical path and that would, therefore, not impact on the overall completion date (Ndekugri & Braimah, 2007).

Braimah (2008) states that various methodologies have been developed over the years as aids to evaluate the criticality of delays. These methodologies can be divided into different categories (non-critical-path method-based techniques and critical-path method-based techniques) and different types, as are encountered in projects. The methodologies for analysing delay are summarised and categorised in Table 1.

Table 1: Delay Analysis Techniques (DATs)

Name	Description	Literature
As-planned vs. as-built	Compare baseline programme with as-built programme to determine overall delay	Stumpf (2000); Lucas (2002); Lovejoy (2004); Pickavance, (2005); Arcuri & Hildreth (2007); Braimah (2008); Barry (2009); SCL (2017)
As-planned but for	Take the actual as-built schedule and take out the duration of all the excusable delays	Alkass et al. (1995); Pinnell (1998); Braimah (2008); SCL (2017)
Impacted as-planned	Incorporate delays into as-planned (baseline) programme	Trauner (1990); Pinnell (1998); Lucas (2002); Lovejoy (2004) Pickavance (2005); Braimah (2008) SCL (2017); Enshassi and Jubeh (2009)
Collapsed as-built	Eliminate delays from as-built programme	Pinnell (1998); Stumpf (2000); Wickwire & Groff (2004); Lovejoy (2004) Braimah (2008); Barry (2009); SCL (2017)
Window analysis	Divide the programme in a number of time periods and update each window with delays in that period	Lovejoy (2004); Pickavance (2005); Braimah (2008); SCL (2017); Menesi (2007)
Time impact analysis	Establish effect of individual delays on baseline programme and evaluate delays chronologically	Alkass et al. (1995); Pickavance (2005); Braimah (2008); SCL (2017); Menesi (2007); Ng et al. (2004)

3. RESEARCH METHODOLOGY

This descriptive study consist of four phases in which primary and secondary data were obtained using qualitative and quantitative approaches. A comprehensive literature review was carried out to identify various types of delays in construction and commonly used DATs. Primary data collection consists of three major stages as a desk study, in-depth expert interviews and a questionnaire survey. Qualitative and quantitative research approaches were used interchangeably to get the required information and the research therefore had a mixed approach. Creswell (2018) have proved that combined methods give more accurate results as the qualitative findings could be further refined and validated through the quantitative methods.

Desk study was carried on FIDIC 1999 red book in order to identify the contractual provisions giving rise to delay claims, i.e., excusable delays. Desk study findings were refined and validated through the expert interviews. Other major purposes of expert interviews were to identify the practical usage of DATs and factors affecting selection of a DAT. Questionnaire survey was used to identify the relative importance of qualitative findings and to evaluate the appropriateness of commonly used DATs against DAT selection criteria.

Expert interviews were carried out in the form of semi-structured interviews. 06 in-depth interviews were carried out with a panel consisting of two (02) claim/contract specialists, two (02) contract administrators and two (02) adjudicators (referred to as E1, E2, E3, E4, E5 and E6 in the research findings section). Purposive sampling technique was used to select the sample according to criterion formulated by the researcher as; 'construction professionals who are having more than 20 years of experience working for both employer and contractor and having at least 10 years of experience with relate to administration of claims'.

Subsequently, a questionnaire survey was conducted thereafter among Engineers, project managers and quantity surveyors who were involved in delay analysis in construction projects covering both construction and consultant professionals. Questionnaire was designed with two major sections. Purpose of the section I was to identify the relative importance of the factors affecting the selection of a DAT. Purpose of section II was to map the same factors to the identified DATs in order to derive the appropriateness of the DATs. 60 questionnaires were distributed 30 each for professional representing contractor and consultant). Response rate was 85% and 77.5% respectively.

Content analysis was used for analysis of qualitative data while relative importance index (RII), mean weighted rating (MR) and criterion suitability score (CSS) were used to analyse the quantitative data.

$$RII = \sum (W_n) / (A \times N)$$

$$MR = \sum_{i=1}^{n} (Fi \times \%R)$$

$$CSS_i = RII_i \times MR_i$$

RII = Relative Importance Index, **W** = Weighting given to each factor by the respondents, **n** = Frequency of responses, **A** = Highest weight, **N** = Total number of respondents, **MR** = Mean Weighted Rating, **Fi**= Frequency of responses for an attribute, **%R**= Percentage response to rating point of an attribute, **CSS =** Criterion Suitability Score

4. RESEARCH FINDINGS

4.1 ESTABLISHING THE EXCUSABILITY OF DELAYS IN FIDIC 1999

A desk study was conducted based on FIDIC 1999 red book and the findings were refined through experts in order to identify the major contractual provisions for excusable delays. All together 18 sub-clauses, as shown in Table 2, were identified as contractual provisions applicable for excusable delays. 20 sub-clauses were identified through the desk study, however, sub-clause 4.7 [setting out] and 4.24 [Fossils] was omitted since E1, E2, E4 and E6, mentioned that *"delays due to fossils and setting out are rare in contracts"*. Hence following clauses were identified as the contractual provisions giving rise to delay claims under FIDIC 1999 red book.

Table 2: Sub-clauses applicable for excusable delays in FIDIC 1999 red book

No	Sub-Clause No.	Sub Clause Name
1	Sub-Clause 1.9	Delayed Drawings or Instructions
2	Sub-Clause 2.1	Right of Access to Site
3	Sub-Clause 2.4	Employer's Financial Arrangements
4	Sub-Clause 3.3	Instructions of the Engineer
5	Sub-Clause 4.12	Unforeseeable Physical Conditions

No	Sub-Clause No.	Sub Clause Name
6	Sub-Clause 8.3	Programme
7	Sub-Clause 8.5	Delay Caused by Authorities
8	Sub-Clause 9.1	Contractor's Obligation
9	Sub-Clause 9.2	Delayed Tests
10	Sub-Clause 10.3	Interference with Tests on Completion
11	Sub-Clause 13.1	Right to Vary
12	Sub-Clause 13.3	Variation Procedure
13	Sub-Clause 13.7	Adjustments for Changes in Legislation
14	Sub-Clause 14.6	Issue of Interim Payment
15	Sub-Clause 14.7	Payments
16	Sub-Clause 14.8	Delayed Payment
17	Sub-Clause 16.1	Contractor's Entitlement to Suspend Work
18	Sub-Clause 19.1	Definition of Force Majeure

The Contractor should demonstrate that the entire delay is excusable under the governing provisions. The notice of claim is to be given within 28 days after the Contractor became aware or should have become aware of the claim related event. In FIDIC 1999 conditions of contracts, a valid claim notice is a condition precedent to submitting a claim. If the notice of claim is not given within 28 days, the contractor is not to be entitled to any additional payment, the time for completion is not to be extended and the Employer is to be discharged from any responsibility regarding the claim related event.

Further, according to FIDIC 1999, within 42 days or other period after the Contractor became aware, or should have become aware of the claim related event, the contractor is to submit the "fully detailed claim" to the Engineer. However, FIDIC is silent on the entitlement of submitting a claim if the contractor fails to submit a valid claim within the stipulated time period. E1, E2, E5 and E6 was of the view that *since FIDIC is silent on the entitlement of submitting a claim if the Contractor fails to submit a valid claim within the stipulated time period, it does not revoke the Contractor's right of submitting a claim within a reasonable time period.* However, E3 and E4 mentioned that *even though FIDIC is silent on this matter, Engineer should be able to reject a claim if the Contractor submits the Claim after 42 days without a valid reason of doing so.* According to E4 *"an internationally recognised standard form of contract like FIDIC would not stipulate a time frame for submitting a claim without a reason".* However, all the respondents agreed that as per the International Chamber of Commerce (ICC)'s interim award in 2015, once a proper notice of claim is submitted as per the contract, the Contractor can submit the detailed claim even after passing of 42 days. Further, the respondents highlighted the obligation of delay mitigation by the contractor. According to E5 and E6, although the contractor has a contractual entitlement for a delay claim, if the particular delay could have been mitigated without difficulty, the entitlement may be revoked in arbitral and/or court jurisdictions.

In the case of concurrent delays, according to the respondents, the approach called 'Malmaison Approach' [named after the decision in *Henry Boot Construction (UK) Ltd v. Malmaison Hotel (Manchester) Ltd*] which concludes, '*where there is concurrent delay the contractor is entitled to an extension of time but is not entitled to loss or expense incurred during the extended period'* is widely adopted in analysing concurrent delays. This is also reiterated in the Delay and Disruption Protocol (SCL, 2017). However, according to E5 and E6, there are approaches such as 'dominant cause' and 'but-for' approaches which are less popular due to the complexity and the subjectivity of their usage.

4.2 USAGE OF DELAY ANALYSIS TECHNIQUES IN ESTABLISHING CRITICALITY OF DELAYS

Respondents were presented with the delay analysis techniques identified in literature. General consensus of experts were that DATs are not being used in a systematic manner in the construction industry. However, all the respondents identified *as planned vs. as built, collapsed as built, impacted as planned, time impacted analysis, and window analysis* as commonly practiced DATs in the local and global construction industries. Further, all the respondents agreed that, as planned vs. as built is the predominantly used technique mainly due to its simplicity. Subsequently, all the five (05) techniques identify in this section are considered in this study.

4.3 SELECTION OF DELAY ANALYSIS TECHNIQUES

Selection of the appropriate DAT is important for both the Contractor and the Employer in establishing and assessing the delay. Therefore, the experts were asked to identify the most important factors to be considered in selecting a DAT. *E2 stated that "no standard form of contract encourages parties to agree on a particular DAT hence it is mostly up to the contractor to decide which DAT to be used in the given context".* However, all the respondent agreed that time and cost of the analysis, availability of contemporary records, number and nature of delay events, reliability of the outcome and acceptability in dispute boards/arbitral tribunals/courts are important factors to be considered in selecting a DAT. E1, E2 and E4 identified workability of the analysis and skill of the analyst as further important factors while E6 stated that *"although most standard forms of contracts do not recommend any DATs, it is important to look into conditions of contracts for any such provisions"*. Following list consist of all the factors affecting the selection of a DAT as per the interview findings.

- Time taken for the analysis
- Cost of the analysis
- Skill of the analyst
- Nature of the delay events
- Number of delay events
- Acceptability in dispute boards/arbitral tribunals/courts
- Workability of the analysis
- Availability of relevant contemporary records
- Reliability of the outcome
- Conditions of contract

4.4 IMPORTANCE OF DAT SELECTION FACTORS

Section I of the questionnaire was aimed to identify the importance of each characteristic which was identified during the expert interviews when selecting a suitable delay analysis technique. Accordingly, respondents were asked to react on a five-point Likert scale in order to determine the importance of each characteristic. Then the findings were ranked based on the RII values as shown in Table 3.

Table 3: Importance of DAT selection factors

Factor	RII	Rank
Availability of relevant contemporary records	0.826	1
Number of delay events	0.784	2

Factor	RII	Rank
Nature of the delay events	0.778	3
Reliability of the outcome	0.766	4
Cost of the analysis	0.685	5
Time taken for the analysis	0.624	6
Acceptability in dispute boards/arbitral tribunals/courts	0.545	7
Workability of the analysis	0.453	8
Skill of the analyst	0.245	9

4.5 MAPPING THE APPROPRIATENESS OF DELAY ANALYSIS TECHNIQUES

Section II of the questionnaire were used to investigate the appropriateness of delay analysis techniques based on their key characteristics that were identified during the expert interviews. A five-point Likert scale was used to gather data from the respondents. Then Mean Rating (MR) values were calculated for every characteristic. Thereafter, the Criterion Suitability Score (CSS) was calculated by multiplying the mean rating value with the relative importance index. Ultimately, CSS was used to evaluate the degree of suitability of each delay analysis technique for a given characteristic as shown in table 4.

4.6 FRAMEWORK DEVELOPED FOR ASSESSING DELAY CLAIMS

Considering the findings with relate to assessing the excusability and the criticality of the delays in delay claims, a framework is developed for assessing delay claims as shown in figure 1 which shows the window analysis technique is highly reliable and more suitable in complex delay scenarios. As planned vs. as built is the simplest technique which can be used with minimum information and lesser time and cost, however less reliable.

5. CONCLUSIONS

Delay claims are common in construction projects and they one of the major sources of disputes in construction contracts. Therefore, it is critical to assess and evaluate these claims efficiently in a timely manner to prevent any retarding impacts on the project progress. Assessment of delays involves scrutinising the excusability and criticality of delays. In terms of assessing the excusability of delays under FIDIC 1999 red book, proper identification and the interpretation of the general and particular conditions of contract is a must. Further, the notice requirement is a condition precedent in submitting a claim. Other important aspects to be considered are the concurrency of delays and the contractor’s obligations of mitigating delays. Specially in the case of concurrent delays, FIDIC 1999 red book itself does not provide any guidance, hence other sources like delay and disruption protocol, arbitral and court decisions need to be referred. However, these external sources not being part of the contract could create challenges in assessing such claims. Criticality of delays need to be established through DATs with essential supporting documents such as properly amended programmes. In terms of selecting a DAT, reliability of the outcome, availability of relevant contemporary records and acceptability in dispute boards/arbitral tribunals/courts are the most important factors to be considered. In that regard window analysis method is identified as the most suitable technique to be used in establishing the criticality of the delay. However due to the complexity of the window analysis method and the poorly prepared baseline programmes in most of the projects, the as planned vs. as built method is most commonly practiced in the industry. The framework shown in figure 1 provides a holistic approach for assessing delay claims in terms of excusability and criticality.

Table 4: Criterion suitability of different delay analysis techniques

Characteristic	As planned vs as built				Collapsed as built				Impacted as planned				Time impact analysis				Window analysis			
	RII	MR	CSS & Rank		RII	MR	CSS & Rank		RII	MR	CSS & Rank		RII	MR	CSS & Rank		RII	MR	CSS & Rank	
Time taken for the analysis	3.512	0.702	**2.465**	**1**	3.302	0.660	2.179	2	2.744	0.549	1.506	3	2.395	0.479	1.147	5	2.698	0.540	1.457	4
Rank 1: means time taken for analysis is low																				
Contemporary records	2.070	0.414	0.857	5	3.674	0.735	**2.700**	**1**	2.930	0.586	1.717	3	2.791	0.558	1.557	4	3.372	0.674	2.273	2
Rank 1: means requirement of contemporary records is minimum																				
Cost of the analysis	3.302	0.660	2.179	2	3.511	0.702	**2.465**	**1**	3.000	0.600	1.800	3	2.465	0.493	1.215	5	2.837	0.567	1.609	4
Rank 1: means cost of the analysis is low																				
Number of delay events	2.861	0.572	1.636	5	3.326	0.665	2.212	3	3.233	0.647	2.092	4	3.348	0.670	2.243	2	3.698	0.740	**2.737**	**1**
Rank 1: means most suitable when number of delay events are high																				
Nature of the delay events	2.418	0.484	1.170	5	3.122	0.621	1.971	3	2.924	0.407	1.192	4	3.375	0.628	2.120	2	3.651	0.730	**2.665**	**1**
Rank 1: means most suitable when the nature of delay events are complicated																				
Workability of the analysis	3.116	0.623	1.941	2	1.558	0.312	0.486	5	3.349	0.670	**2.244**	**1**	2.628	0.526	1.382	4	2.465	0.493	1.215	3
Rank 1: means the workability of the analysis is high																				
Skill of the analyst	3.465	0.693	**2.401**	**1**	2.163	0.433	0.937	5	2.954	0.591	1.746	2	2.884	0.577	1.664	3	2.512	0.502	1.261	4
Rank 1: means the analyst does not have to possesses higher levels of technical skills																				
Reliability of the outcome	1.768	0.353	0.624	5	3.489	0.698	2.435	3	1.977	0.395	0.781	4	3.907	0.781	3.051	2	4.000	0.800	**3.200**	**1**
Rank 1: means the reliability of the outcome is high																				
Acceptability in dispute courts	2.564	0.483	1.240	5	3.024	0.615	1.861	3	2.968	0.455	1.352	4	3.917	0.792	3.102	2	4.000	0.800	**3.200**	**1**
Rank 1: means there is high acceptability in courts																				

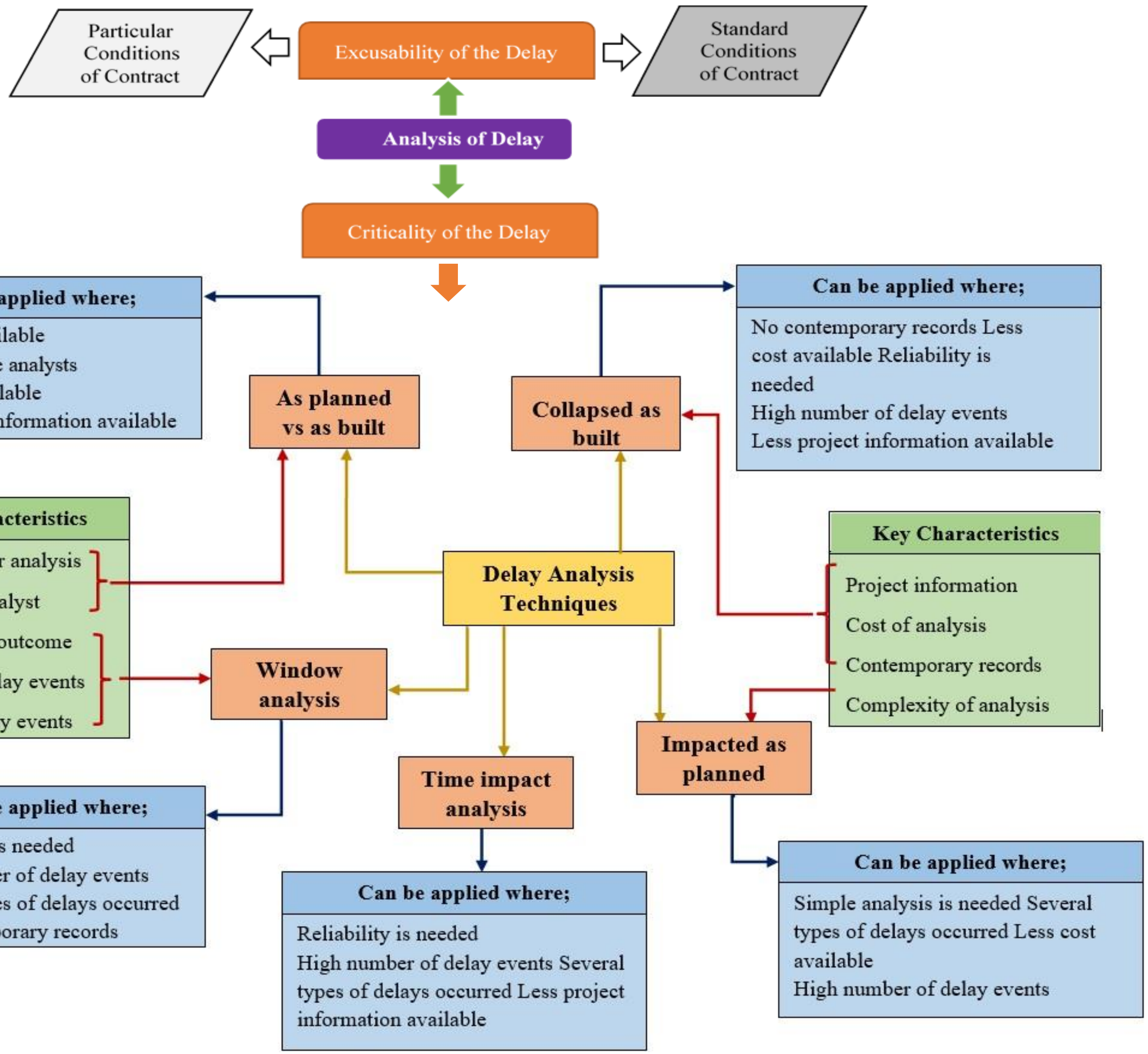

Figure 1: Framework for assessing delay claims

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