# Evolution of Claim and Dispute Resolution Mechanism in FIDIC 1987, 1999 and 2017

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No part of this thesis has been submitted anywhere else for any other degree. This thesis is submitted to the National University of Sciences and Technology (NUST) in partial fulfillment of the requirements for the degree of Master of Science in the field of Construction Engineering and Management from NUST institute of Civil Engineering (NICE), School of Civil and Environmental Engineering (SCEE), NUST

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| | |
|---|---|
| FIDIC | Fédération Internationale des Ingénieurs-Conseils |
| DAB | Dispute adjudication board |
| DAAB | Dispute avoidance\ adjudication board |
| NoC | Notice of claim |
| NoD | Notice of disagreement |
| EIR | Engineers' initial response |
| FDC | Fully detailed claim |
| NoA | Notice of agreement |
| Det | Determination |
| RDA | Refer dispute to arbitration |
| RDD | Refer dispute to DAB\ DAAB |
| CmA | Commencing arbitration |
| CLB | Contractual and other legal claim |
| AP | Additional particulars |
| NoPA | Notice of party's agreement |
| PtD | Proceed to give determination |
| RAP | Request additional particulars |
| NoED | Notice of engineer determination |
| Res. | Respondent |

# ABSTRACT

By looking at the changes in the formation and structure of the claims and dispute resolution mechanisms in the FIDIC contracts, 1987, 1999 and 2017, it is shown that no attempt has been made to improve procedural lethality and neutrality in managing construction disputes. This research critiques the shift from the refinement of arbitration to the launch of Dispute Adjudication Boards (DAB) in FIDIC 1999 and further to the intricate Dispute Avoidance/Adjudication Boards (DAAB) in FIDIC 2017. In this work, the analytical approach is qualitatively based. It comprises the documentary content analysis of the three editions of the document, assisted by the thematic and sentiment analysis of the software NVivo in interviews with experts. It is suggested by the study's results that the first guidelines were formed by FIDIC 1987, but they were neither detailed nor efficient, and the dispute remained inefficient. The main drawbacks of DABs remain in the two issues relating to enforceability and jurisdiction. So, there was an application of DABs not only for FIDIC 1999 but with FIDIC 1999 introducing enhanced principles of dispute resolution. Introducing the DAAB in 2017, these mechanisms have been further improved to contribute to the industry's corporate spirit, which is aligned with current times. Expert sentiment analysis of these advancements includes procedural guidelines and effectiveness of DAABs, limitations of jurisdictional flexibility, notice scenario, and cost-effectiveness. Finally, the last section discusses the ideas for improved regional flexibility in FIDIC frameworks and the international construction industry through relevant and highly advanced technological use of suitable techniques for key stakeholder groups.

**Keywords:** Claims Management, Dispute Resolution, Contract evolution, FIDIC Contracts, DAAB, Construction contracts, Evolutionary Changes.

# CHAPTER 1: INTRODUCTION

The Fédération Internationale des Ingénieurs-Conseils (FIDIC) has critically impacted the development of construction contracting globally. FIDIC, the foremost organization that has adopted standardized construction contract frameworks, has contributed significantly to finding the proper mechanisms for risk allocation, procedural clarity, and claims management. FIDIC has grown continuously since the release of its first standard form in 1957 to cope with the increasing complexities in construction engineering and procurement, so it is relevant and flexible in the construction industry (Abdul-Malak et al., 2024; Barakat et al., 2020).

A significant step forward in the evolution of international construction contracts was seen in the 1987 edition. This standard edition also provided a standardized approach to claims management and dispute resolution. The 1987 edition was a primarily arbitration-based dispute resolution mechanism that heavily relied on arbitration as the preferred dispute resolution mechanism, providing parties with a structured framework to resolve the conflict. Unfortunately, arbitration was criticized as costly, time-consuming, and reactive since disputes were resolved after long delays, usually after the project (Barakat et al., 2019; Shabbar et al., 2017). Limitations aside, this edition set a firm base for subsequent dispute resolution mechanisms and a more efficient customer focus (Fawzy & El-adaway, 2012).

Although still somewhat old-fashioned, the release of the 1999 edition symbolized a paradigm shift in FIDIC's way of dealing with disputes. Moreover, it was the development of introducing the Dispute Adjudication Board (DAB). This entity advocated for resolving disputes to occur in real-time as the project lifecycle took place. With contemporaneous dispute addressing, delays and cost overruns were reduced to enhance a proactive and efficient conflict management approach (Cevikbas et al., 2024). Nevertheless, the DAB implementation was found problematic as, for instance, adjudication decisions were inconsistent, and costs were difficult to manage (Abdul-Malak & Senan, 2020; Hardjomuljadi, 2020).

The advancements of the 1999 edition were built on, and the 2017 edition introduced the Dispute Avoidance/Adjudication Board (DAAB). However, beyond dispute resolution, this mechanism included dispute avoidance measures aimed at facilitating early but productive collaboration

among the stakeholders to identify and mitigate potential conflicts prior to escalation (Barakat et al., 2020). The DAAB mechanism emphasized the need for open communication and cooperation, which helped the project's outcomes, such as decreased delays and stronger stakeholder relationships (Gamage et al., 2024). Furthermore, this edition included the enforceable provisions through which its dispute resolution processes' legal and procedural robustness is enhanced. So far, the DAAB mechanism has accommodated this improvement in communication and reduction of time on the project despite challenges in law and contract development in jurisdictions with underdeveloped legal and contractual systems (Abdul-Malak & Tabbara, 2023; Zhao, 2022).

FIDIC's standard forms have evolved over the decades to address the construction industry's constant challenges. Mitigating differences and improving the effectiveness of construction projects has been made possible by the organization's efforts centered on fairness, efficiency and cooperation. In this connection, the 1987 edition played an important part in bringing structured dispute resolution predicated on arbitration and the 1999 edition inculpating DAB with a proactive approach to conflict management. This cumulative trajectory continued with the 2017 edition, which combined emphasis on dispute resolution and the avoidance thereof with early stakeholder participation and enforceable provisions (Assaad & Abdul-Malak, 2020; Jagannathan & Delhi, 2020).

FIDIC’s evolving frameworks have also recently been highlighted by further studies as ones that address modern construction challenges. As an illustration, including means to cope with unpredicted events impacts, specifically, the COVID-19 pandemic reveals FIDIC’s capacity to adapt to unprecedented risk. This study finds that COVID-19-induced events are best treated under the 2017 edition of the red book by being treated as commercially reasonable, flexible, and robust mechanisms to accommodate global disruptions (Abdul-Malak et al., 2024). With technological changes and data analytics, there are other ways through which claim management and dispute resolution processes are being improved. The research results on predictive models for delay dispute cases and game theory in dispute resolution decision-making show the potential to incorporate innovative tools in FIDIC’s frameworks (Alrasheed et al., 2024; Kandel et al., 2023).

Nevertheless, it should be noted that the implementation of FIDIC’s mechanisms in various legal and contractual settings is not without challenges. DAAB, depending on the legal infrastructure

and stakeholder expertise in a jurisdiction, may or may not be effective. Capacity-building attempts and strategies for implementing FIDIC's frameworks in underdeveloped regions have been identified as research areas (Okudan & Çevikbaş, 2022; Senaratne & Farhan, 2023). Furthermore, the more complex construction projects are, the more the need for continuous updates to FIDIC's standard forms so that the new risks and challenges may be adequately addressed (Kalogeraki & Antoniou, 2024).

Stakeholder engagement and collaboration are critical aspects or processes for resolving disputes in a dispute context. The emphasis put in the 2017 edition on dispute avoidance reflects a general preference for more proactive approaches to resolving construction disputes. FIDIC establishes such frameworks to prevent conflicts and improve project outcomes by promoting early communication and collaboration amongst stakeholders. Such an approach is particularly relevant in large-scale infrastructure projects where dispute management is crucial for an ensured, fast and cost-efficient execution (Do et al., 2022; Riaz et al., 2023).

Lastly, completing FIDIC's standard forms from the 1987 edition to the 2017 edition shows that FIDIC has been meticulous in the complex construction contracting process. The organization's thrust is inequitable risk allocation, procedural clarity, and efficient dispute resolution, which are instrumental in making construction projects globally efficient. Although much progress has been achieved, further work and development in this area are needed to confront the specific issues of applying FIDIC's mechanisms in different settings. Incorporating the learning of what has been victorious and using what is new, FIDIC will certainly stay relevant in writing the contracts of construction (Thi Hoa & Hoang Tu Linh, 2023).

### 1.1 Problem statement

The FIDIC Agreements have significantly improved mechanisms for handling disputes and claims, yet challenges persist, particularly regarding delay and disruption claims. These issues can have substantial financial impacts, and FIDIC's various versions have adopted different approaches to managing such claims based on earlier lessons. (Barakat et al., 2019; Zhao, 2022) However, ongoing construction delays and disruptions necessitate a continuous review of FIDIC's dispute resolution mechanisms to ensure their effectiveness. (Do et al., 2022; Riaz et al., 2023).

## 1.2 Research Gap

Despite the extensive adoption of FIDIC standard forms worldwide, there is a noticeable lack of comprehensive comparative analyses focusing on the evolution of dispute resolution mechanisms and disruption claims across the 1987, 1999, and 2017 editions. While individual editions have been studied in isolation, the absence of an integrated evaluation limits a holistic understanding of their practical implications, effectiveness, and adaptability to modern construction challenges. This gap is particularly critical in assessing how these mechanisms address key issues such as efficiency, fairness, enforceability, and stakeholder collaboration in diverse legal and contractual environments.

## 1.3 Research question

1. How do the claim and dispute resolution mechanisms differ in FIDIC 1987, 1999, and 2017?
2. Which measures should be proposed to improve these processes in the subsequent construction projects?

## 1.4 Objectives

1) To compare FIDIC 1987, 1999, and 2017 claim and dispute resolution mechanisms.
2) To evaluate FIDIC claim and dispute resolution mechanisms through industry interviews.
3) To recommend improvements in FIDIC claims handling and dispute resolution for future projects.

## 1.5 Theoretical Framework

The research theoretical framework is based on four foundations, namely: Contract Theory, Dispute Resolution Theory, Institutional Theory, and Project Management Theory. The theories offer a panoramic view into the evolution and utility of the various claims and the dispute resolution mechanism embedded in FIDIC contracts (1999 and 1987 and 2017) to its effect on construction project outcome. Contract Theory (Bolton & Dewatripont, 2004) helps explain how contracts put a finger on who takes up the risks, who is responsible, and who owns the rights in the parties of FIDIC contracts. As an example, the tighter deadlines and document requirements

involved in the filing of claims in FIDIC 2017 (Bunni, 2013) represent the switch to offer a balance of interest to the employers and contractors in a way that minimizes the possibility of disputes. Dispute Resolution Theory (Cheung & Yiu, 2006; Ury et al., 1988) concentrates on the means and the process for settling the conflicts for example, negotiation, mediation, adjudication, and arbitration. For instance, this theory is highly suited to analyze the transition from adversarial approaches as laid down in FIDIC 1987 to the use of Dispute Adjudication Board (DAB) as described in FIDIC 1999, and Dispute Avoidance/Adjudication Board (DAAB) in FIDIC 2017 (Mante, 2015). The introduction of the DAB and its evolution into the DAAB highlight FIDIC's emphasis on neutral third-party involvement and proactive dispute avoidance (Jaeger, 2010).

Institutional Theory (DiMaggio & Powell, 1983; Scott & Levitt, 2017) elucidates how changes on the environment (legal reforms, globalization, industry trends), influence the change of FIDIC contracts. For instance, DAB and DAAB have evolved as the representatives of the growing demand for standardized international agreements and have hastened dispute resolution mechanisms. Finally, Project management theory, (Kerzner & Saladis, 2017) is used to analyze how the claim and dispute resolution mechanisms influence project outcomes, such as cost, time, quality and stakeholder relations. Claim and dispute resolution mechanisms that are efficient in terms of reducing delays, cost overruns and conflicts enhance better project performance. (Cheung & Yiu, 2006). This research integrates these theories to study how FIDIC contracts adjusted to know emergent problems in the construction industry and project performance.

### 1.6 Conceptual framework

Consequently, the evolution of the dispute resolution mechanisms and the emergence of disruption claims are considered considering the FIDIC contracts (Abdul-Malak & Tabbara, 2023; Barakat et al., 2019). This study analyzes the change of these mechanisms from the FIDIC released in 1987, 1999, and 2017 and evaluates whether these mechanisms are already able to cope with modern industry problems (Barakat et al., 2019). The framework in Figure 1 can define the relations of these declarative variables and link the variables to explain and evaluate the results. (Abdul-Malak & Tabbara, 2023; Do et al., 2022).

This is an evolution of FIDIC dispute resolution and disruption invoices, with the assistance of main contractual developments among FIDIC styles. The research theme is the transformation of dispute resolution mechanisms and disruption claims in international construction contacts, and we start from the top and tackle the framework. The second layer categorizes the FIDIC contract editions, emphasizing three significant milestones: the 1987 edition, which primarily relied on arbitration as the dispute resolution mechanism; the 1999 edition, which introduced the Dispute Adjudication Board (DAB) to provide a more proactive and efficient resolution process; and the 2017 edition, which refined this system by implementing the Dispute Avoidance/Adjudication Board (DAAB), shifting towards a more preventive and collaborative approach.

The study is differentiated into the third section, which is between the mechanisms for dispute resolution and disruption claims these constitute the two fundamental parts of the study. The fourth layer is a comparative analysis of the dispute resolution mechanisms represented by these editions based on various key evaluation criteria, including efficiency, fairness and challenges in each of the contested dispute resolution methods. The framework concludes with recommendations to improve FIDIC contracts in the future based on these comparative findings and suggests ways of improving dispute resolution and claim management. Reducing this structured flow offers a sound way to grasp the evolution path of FIDIC's contractual framework and the possible influence in dispute resolution and disruption claims.

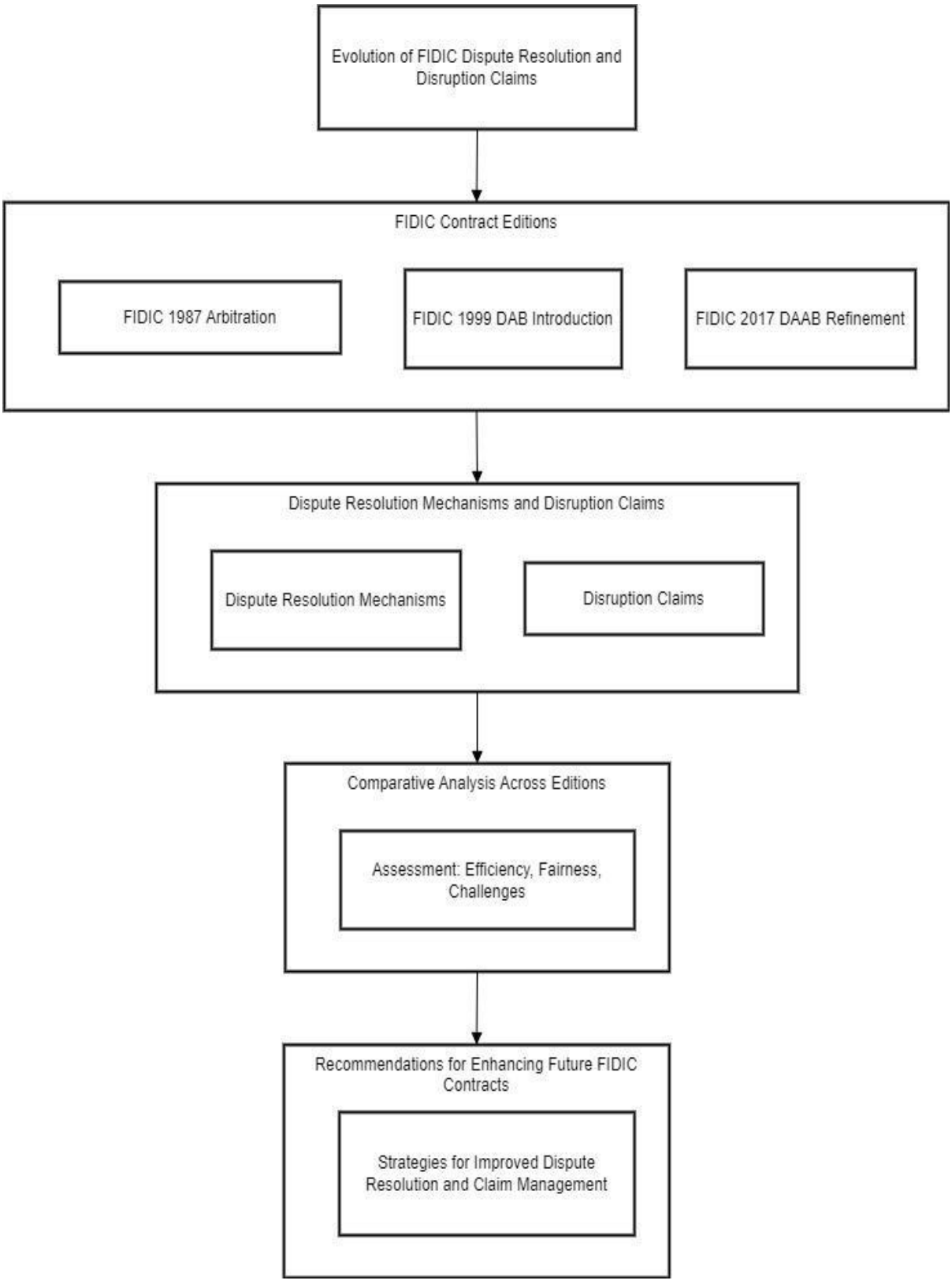



***Figure 1: Conceptual Framework***

## 1.7 Thesis Organization

Sections 1 to 5 that constitute this thesis revolve around its coverage of the evolution of claim and dispute resolution mechanisms in FIDIC 1987, 1999 and 2017.

### *1.7.1 Chapter 1: Introduction*

The background of this research is overviewed in this chapter and the significance of claim and dispute resolution in construction contract. The research problem, objectives, scope and significance constitute the basis for the analysis of FIDIC's evolving frameworks.

### *1.7.2 Chapter 2: Literature Review*

This chapter critically reviews the literature on claiming and on dispute resolution under FIDIC 1987, 1999, and 2017. The main contributions of this article are on how the key contractual changes, stakeholder perspectives, and challenges that take place in the implementation of FIDIC's evolving dispute resolution frameworks. Previous research is compared, then gaps addressed by this study are highlighted.

### *1.7.3 Chapter 3: Research Methodology*

In this chapter, we provide research design, how data has been collected and how analyses have been done. Provides a description of how NVivo has been used for qualitative coding and expert interviews to examine industry views of dispute resolution under each FIDIC edition.

### *1.7.4 Chapter 4: Analysis and Results*

The results of the interviews and NVivo coding of the interviews that identify common trends in claim and dispute resolution across FIDIC editions is provided here. DABs and DAABs are assessed based on key themes and patterns to determine their practical effectiveness.

### *1.7.5 Chapter 5: Conclusion and Recommendations*

The final chapter contains conclusion of research work. Furthermore, limitations are discussed, and recommendations are proposed for future construction projects.

# CHAPTER 2: LITERATURE REVIEW

## 2.1 Scientometric Analysis

Figure 2 represents the visualization of the initial research area. The node's size expresses the importance of specific keywords, and the thickness of the line denotes how often these words were used together. This helps in bundling the related terms, clearly showing the separate research areas and perceiving the patterns and missing coverage in the study.

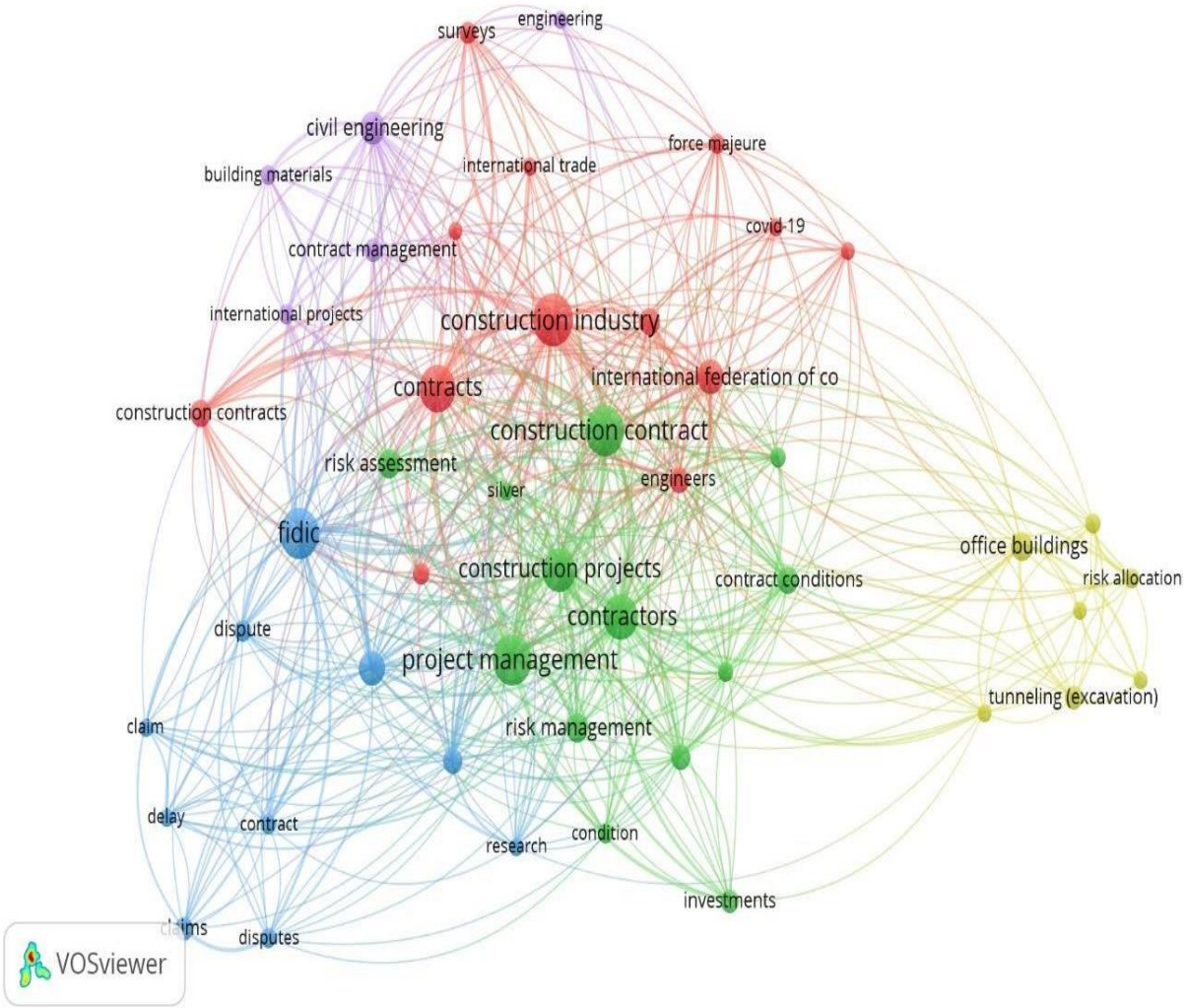



***Figure 2: Co-occurrence of keywords***

### 2.2 Roles and Changes in 2017 FIDIC Claim and Dispute Resolution

In their 2020 research, Barakat Abdul-Malak and other contributors explore the significant modifications introduced by the 2017 FIDIC conditions regarding claims and dispute resolution. The study emphasizes procedural enhancements to mitigate disputes and contrasts these with the previous 1999 FIDIC conditions. Utilizing primarily qualitative analysis, the research evaluates and juxtaposes both iterations. It underscores the systematic advancements in the 2017 conditions that prioritize dispute prevention; however, it is constrained by its exclusive focus on FIDIC, overlooking other standard forms such as NEC or AIA. To establish a comprehensive framework for dispute resolution, the authors advocate for empirical studies investigating the practical effects of the 2017 conditions and their compatibility with other standard forms.

### 2.3 Operational Variations in Standard Claim and Dispute Mechanisms

A separate investigation by Barakat and Abdul-Malak carried out in 2019 examines the sequence and operational distinctions of standard dispute resolution mechanisms in various construction contracts, including AIA, EJCDC, FIDIC, JCT, and NEC. Their comparative study seeks to aid in formulating project-specific strategies by analyzing the procedural steps outlined in different standard contracts. Although this research provides significant insights into customizing dispute resolution approaches, it is limited to standard conditions, assuming rigorous compliance with contract terms. Future studies could incorporate real-world case analyses and consider external factors such as legal frameworks and cultural differences.

### 2.4 Adoption of Dispute Boards in Indonesia

Hardjomuljadi's 2020 research investigates the application of Dispute Boards (DBs) in Indonesia, highlighting the legal and cultural obstacles encountered. A pilot initiative introduces a tailored DB model that aligns with the Indonesian context. The examination of legal texts and judicial cases reveals the difficulties associated with the integration of DBs. However, the reliance on legal documents and a singular pilot project restricts the broader applicability of the findings. To improve the effectiveness of DBs, it is suggested to broaden DB training, strengthen legal frameworks, and modify practices to better fit local cultural norms and traditions to do so.

### 2.5 Key Causes of Construction Delays

Through quantitative surveys and Structural Equation Modeling (SEM), Do, Nguyen, and their colleagues (2023) identified major causes of construction delay. Geographical scope and channel bias in sample selection limit the analysis of this study, which only focuses on projects in Vietnam. The authors recommend other areas to do studies with that use random sampling and qualitative methods for confirmability.

### 2.6 Disruption Claims Management Risks in Construction Projects

Cevikbas, Okudan, and colleagues (2024) present DCM in which 42 risk factors are divided into six stages. The authors' important findings, derived from qualitative and quantitative data and the fuzzy AHP method for risk assessment, point to the need for further improvement. Nonetheless, the study's applicability is constrained by limited expert contributions. It is essential to validate the framework in future research by engaging a broader range of experts and applying it to various projects to further the development of the field.

### 2.7 Factors Leading to Litigation in Construction Contracts

Jagannathan and Delhi (2020) provide a literature review on factors triggering litigation in construction contracts, emphasizing behavioral factors. Using NVIVO, the study synthesizes existing literature, revealing themes leading to litigation. Although it highlights important overlooked behavioral aspects, it is limited by relying on existing literature without primary data. The authors propose addressing these behavioral factors through enhanced communication and conflict management training.

### 2.8 COVID-19 Event Treatment in FIDIC Contracts

Abdul-Malak, Sanbouskani, et al. (2024) compare how the FIDIC 2017 and 1999 Yellow Books handle delay and disruption claims, focusing on COVID-19. The study emphasizes the more extensive approach of FIDIC 2017 to risk allocation and dispute resolution. Nonetheless, implementing new provisions and increasing administrative requirements are noted limitations. The authors recommend stakeholder training on FIDIC 2017 and frequent updates.

## 2.9 Expert Roles in Claims and Dispute Resolution

Abdul-Malak and Tabbara (2023) categorize expert roles in resolving claims and disputes to enhance processes. This qualitative research develops a system for expert engagement based on interviews and case studies. Despite providing comprehensive role mapping, the study's qualitative focus and small sample size are constraints for future studies, including quantitative data and expanding the sample size is suggested.

## 2.10 Comparative Analysis of Delay Dispute Cases

Alrasheed, Soliman, et al. (2024) present a prediction model for claimed values in the comparative analysis of delay disputes. The model aims to apply machine learning to connect legal reasoning and prediction. It is promising. However, its generalization to other settings remains questionable and depends on the quality and amount of data available. More data is recommended, and testing this on other projects and in different legal jurisdictions is recommended.

## 2.11 Enhancing Outcomes in Alternative Dispute Resolution

Gamage, Thayaparan, et al. (2024) analyze efficient ADR mechanisms in Sri Lanka’s construction sector. They offer a conceptual model that outlines the factors that prevent ADR success and offers real-life recommendations. This study provides detailed frameworks and practical recommendations for building projects, excluding infrastructure projects. Others involve increasing stakeholders' awareness of the ADR processes and tailoring the ADR to suit particular disputes or projects.

## 2.12 Game Theory in Construction Dispute Resolution

Kandel, Eid, et al. (2023) apply game theory in construction project disputes, focusing on decisions across the value chain to identify the best solutions and game strategy for the construction stakeholders concerning the Egyptian construction industry. The combination of game theory and AHP encourages pre-arbitration settlements, thus reducing the arbitration required. However, its generalizability is somewhat constrained due to testing against results within one sector and assuming stakeholders will behave rationally. It is suggested that the model

should be extended to other territories and industries, and behavioral economics should be included.

### 2.13 ADR Selection Framework for PPP Projects

Okudan and Çevikbaş (2022) develop an ADR selection model for Public-Private Partnerships through quantitative and qualitative methods. As a result, the proposed framework provides a clear and coherent model with vast applicability by using fuzzy AHP and TOPSIS. While its complexity and expert reliance may currently inhibit practical application, the potential of this framework, when simplified and validated through additional case studies, is promising.

### 2.14 Claim Management in FIDIC Derivative Contracts

Riaz, Hussain, et al. (2023) review delay management tactics in handling claims using FIDIC derivative contracts during the Jaggran-II hydroelectric project. This qualitative case study presents actionable strategies but is limited to a single case and potential bias. To provide a more balanced view, the authors recommend integrating more case studies and quantitative analysis, enriching the analysis and enhancing the understanding of delay management tactics.

### 2.15 DAB Decisions such as Arbitral Awards or Mediated Settlements

Thi Hoa (2022) assesses whether DAB's decisions within FIDIC should be seen as arbitral awards, exploring their enforceability and legal consequences. The in-depth legal analysis lacks empirical data and varies with jurisdictions' interpretations. The study advises using quantitative data and expanding to compare other resolution methods.

### 2.16 Resolving Loss of Productivity Claims in FIDIC Contracts

Zhao (2022) addresses challenges in resolving productivity loss claims under FIDIC contracts by examining entitlement, causation, and quantification. Offering practical guidance, the study is limited by its theoretical nature and lack of empirical data. Including empirical studies and other contract forms would enrich the analysis.

## 2.17 Effectiveness of Adjudication in Construction Disputes

Abdul-Malak and Senan (2020) reviewed the operation and efficiency of adjudication in construction dispute management, specifically for highway projects that employ design-build contracts. Their prior study focused on establishing the causes of time and cost overruns; this was done using questionnaires, interviews, and reviewing project documentation. The paper used statistical and thematic analysis to identify trends and causes. However, the studies may be specific to highway projects only, and this may reduce the generalization of the results. Moreover, due to its self-administered nature, there might be some biases in the data collected. The authors suggested extending future studies to include more types of infrastructures, using real-time data collection and monitoring, and including more reliable sources.

## 2.18 Timing of Liquidated Damages Recovery and Related Liability Issues

Assaad and Abdul-Malak (2020) examined LD in construction contracts, specifically the timing and recovery methods of LD. In this paper, the authors employed a qualitative research method to analyze LD clauses from six standard contract forms to provide advice on how to increase the likelihood of recovering delay damage. However, as this study is practical, its limitation is that it considers only a few forms of contract and excludes international differences. The authors suggested that the study should be carried out with additional global contract forms and that jurisdictional differences in LD recovery should be considered.

## 2.19 Contractor Time Extension Entitlement under Laws

Elshamy, Kotb et al. (2024) investigated contractor entitlement to EOT under the Egyptian Civil Code (ECC), Law 182, and FIDIC 2017. Their comparative analysis revealed the deficiencies in the legal provisions and showed how FIDIC 2017 sought to rectify the above gaps. Nevertheless, the study provided exhaustive information on EOT provisions, but it lacked empirical support and was predominantly based on Egyptian legislation. The authors called for implementing FIDIC 2017 in Egypt and for constant revision and improvement to the ECC and Law 182.

## 2.20 Tech-Driven Claim Management and Dispute Resolution

Kalogeraki and Antoniou (2024) examined new tendencies in claim management and dispute resolution in the Architecture, Engineering, and Construction (AEC) industry with the help of BIM and blockchain. Employing quantitative and qualitative research, they scrutinized 791 documents from the Scopus database and visualized them using a VOS viewer. Nonetheless, the study effectively achieved the goals set in the paper regarding emerging technologies and their application to the concept. The limitations are the focus on the sources published in English and the lack of a detailed case analysis. The authors suggested that future work should include further practical applications of these technologies beyond the English literature and more cases for detailed analysis.

## 2.21 Contract Administration Guidelines for World Bank–Funded Projects

Fawzy and El-AdAway (2012) provided a framework for handling the conflict, the claim, and the dispute in the WB-financed projects. To do so, the authors contrasted FIDIC contract conditions with World Bank contract conditions concerning unforeseen physical conditions, employer risks, and force majeure. Although their guidelines were detailed, this study would only be relevant to World Bank-financed projects. The authors advised that the guidelines should be updated periodically to meet new concerns in international construction. They called on the stakeholders to enhance their knowledge of the World Bank contracts.

## 2.22 Economic Implications of Delay and Disruption Claims under FIDIC

Gebken and Gibson (2006) previously analyzed the following effects of delay and disruption claims under FIDIC 1999 and FIDIC 2017. Their study employed a quantitative technique of literature review, case, and interviews with experts. The study was able to draw a contrast in handling claims under both versions of FIDIC. Still, the study's general weakness was its dependence on a few cases and specific project conditions. The authors encouraged future research and incorporation of the best practices in contract administration and claims.

## 2.23 ADR Practices in International Road Construction Contracts

According to Kisi, Lee et al. (2020), a comparison of delay and disruption claims between FIDIC 1999 and FIDIC 2017 goes into legal and project management issues. The research employed by the authors consisted only of qualitative approaches, using law cases, industry reports, and contracts. However, they said the study did not go more profound because it relied on secondary data. The authors recommended future research to use more data and more cases on claims management to improve the understanding of the topic.

## 2.24 Effectiveness of Claim Analysis Techniques under FIDIC Contracts

In the work by Senaratne and Farhan (2023), the effectiveness of the current techniques to analyze claims about delay and disruption for FIDIC 1999 and 2017 was assessed. The methods used in forensic delay analysis were compared by their qualitative study using print and electronic materials, contracts, and cases. Nevertheless, the study was restrained to second data because the principles of the 225 were unknown, and the data was extracted from secondary sources. Future studies were called for that included such data and investigated how to improve the accuracy and speed of claim determination through technology.

# CHAPTER 3: METHODOLOGY

## 3.1 Overview

The research design will study the evolution of FIDIC's claim and dispute resolution provisions from 1987, 1999, and 2017. In this sense, this research adopts a qualitative study of the procedural changes and operational impact on these systems (Barakat et al., 2019; Bunni, 2013). The methodology combines documentary analysis with expert elicitation.

## 3.2 Research Methodology Framework

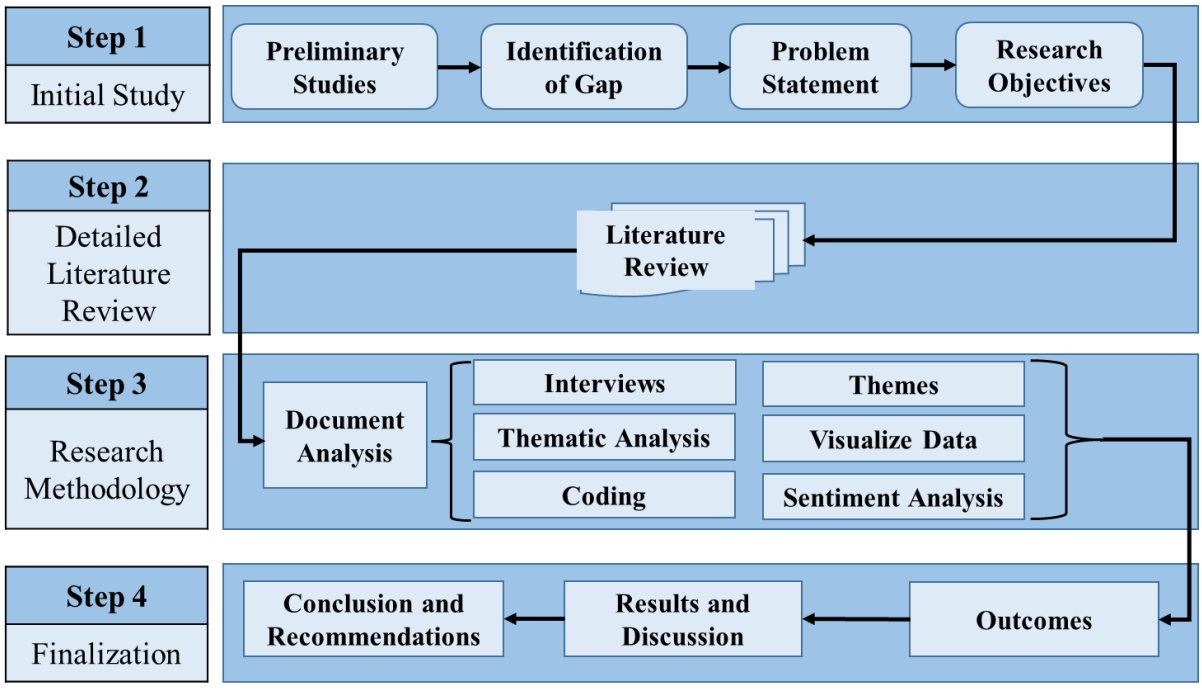



***Figure 3: Research Methodology Framework***

As Shown in Figure 3 the first stage, relevant documents concerning the FIDIC forms and their clauses regarding claims, notice provisions, time bars and dispute resolution provisions are reviewed. This stage facilitates understanding of what the producing countries provide, for the boy countries who supply international interests in various forms. It provides a framework of significant procedural steps, from the arbitration of FIDIC 1987 to the formation of the Dispute

Adjudication Board (DAB) for FIDIC 1999 (Hardjomuljadi, 2020) to the creation of the Dispute Avoidance/Adjudication Board (DAAB) for FIDIC 2017 (Barakat et al., 2020). The findings help explain how each edition of the publication has come to be, particularly as the construction projects have become more involved. The needs of the dispute resolution process have gained in complexity.(Riaz et al., 2023).

Semi-structured interviews are also performed with experts in the industry, including contract managers, claims consultants, legal practitioners and project managers who know the FIDIC framework to add to the documentary analysis (Abdul-Malak & Tabbara, 2023), in order to ascertain issues of practice, efficiency of processes and advancements in dispute resolution mechanisms across the three editions. The information is gathered within an online or live interview with the participants' permission and then transcribed for analysis (Do et al., 2022).

### 3.3 Data Collection

The documentary reviews and interviews are analyzed phenomenologically using NVivo software on the data collected from them as shown in Figure 4. The process of this analysis involves familiarizing yourself with the data, coding, and developing the themes. Based on the exploration and findings, a comprehensive coding framework is created to systematically categorize the findings, which is captured under overarching themes that encapsulate the research insight. (Gamage et al., 2024; Kalogeraki & Antoniou, 2024).

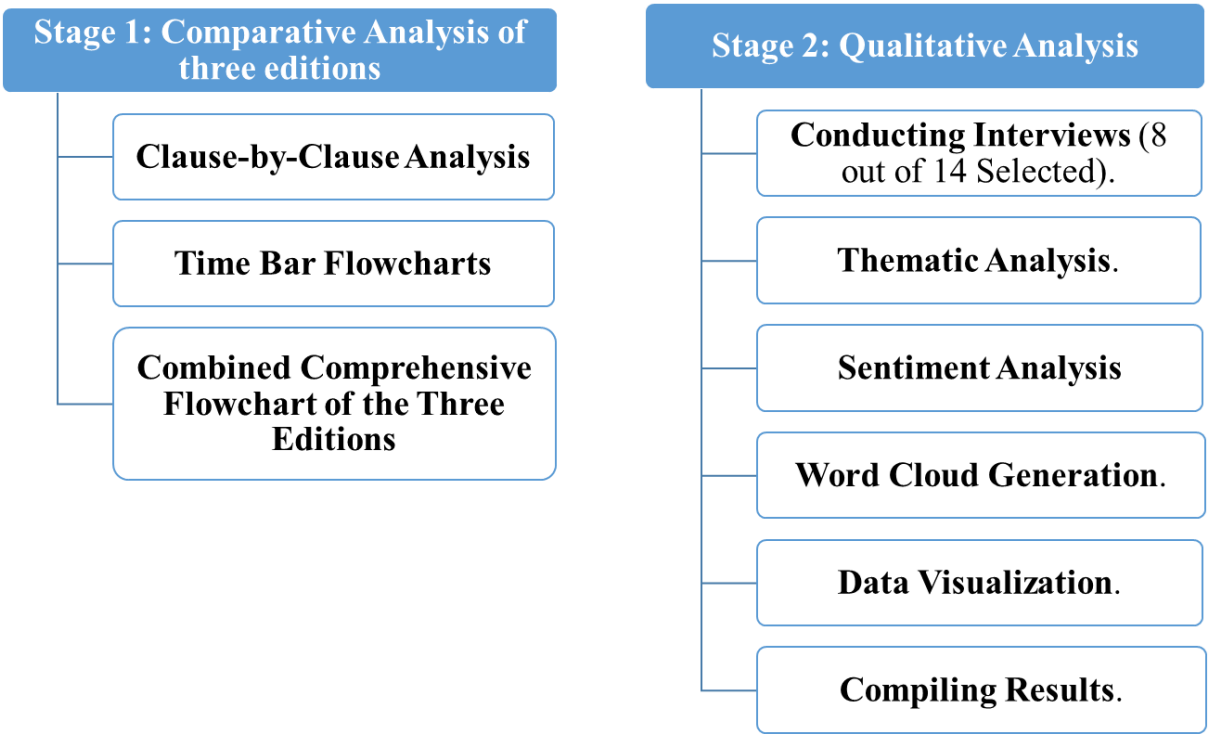



***Figure 4: Steps of Methodology***

### 3.4 Chapter Conclusion

This chapter described the methodology used for the study of the evolution of the claim and dispute resolution mechanisms in FIDIC 1987, 1999, and 2017. Based on qualitative research approach the data were collected by means of interviewing experts and document analysis. The processes of processing were then coded using NVivo themes then to identify the critical aspects of different FIDIC works progress. A comparative analysis framework of dispute resolution over the past has also been incorporated as part of the methodology. The structured approach enabled examination of the claim management processes on a systematic basis and paved in deriving key insights.

# CHAPTER 4: ANALYSIS AND RESULT

## 4.1 Claims Disclosure and Notification Frameworks in FIDIC

The defined claims notification period has been developed over the years of FIDIC contracts to improve the project's transparency and claim processes. FIDIC 1987 did not have a clear time frame within which notice of a claim had to be given, which led to the emergence of disputes due to the delay of notification. (Barakat et al., 2020)This vagueness frequently led to misconceptions between contractors and employers, making project control and risk evaluation more challenging. (Hardjomuljadi, 2020; Jagannathan & Delhi, 2020)To this effect as shown in Figure 5, FIDIC 1999 introduced Clause 20.1, which requires a notice of claim to be given within 28 days of the event's occurrence. (Do et al., 2022; Fawzy & El-adaway, 2012) Although this provision added procedural rationality, it was too formalistic. If there are not strictly adhered to where the technicalities of the procedure are not, then there are legitimate claims that may be thrown out for minor procedural irregularities. (Kalogeraki & Antoniou, 2024; Zhao, 2022). They expressed that such concerns were based on the tension between process rationality and substance equity (Kandel et al., 2023). This has been done by maintaining 28 days of the FIDIC 2017 but allowing the contractor to offer reasons as to why they cannot claim at an earlier time as per Clause 20.2 (Barakat et al., 2019; Elshamy et al., 2024), which allows equity by considering the issues of the delayed time and procedural order. Also, the Modern Additions and Modifications to the Provisions are consistent with the international standards of construction contract management, which improve conflict avoidance and increase the productivity of construction projects (Abdul-Malak et al., 2024; Gamage et al., 2024; Kisi et al., 2020; Riaz et al., 2023). FIDIC 1987 has evolved to FIDIC 2017, allowing ambiguity (now with structured timelines) and promoting early (and efficient) communication and sound procedures and mechanisms of dispute resolution (Abdul-Malak & Senan, 2020; Kalogeraki & Antoniou, 2024). In this regard, FIDIC 2017 allows for flexibility and clarity to be embraced simultaneously so that the notification practices accommodate the challenges in modern construction (Barakat et al., 2020; Hardjomuljadi, 2020).

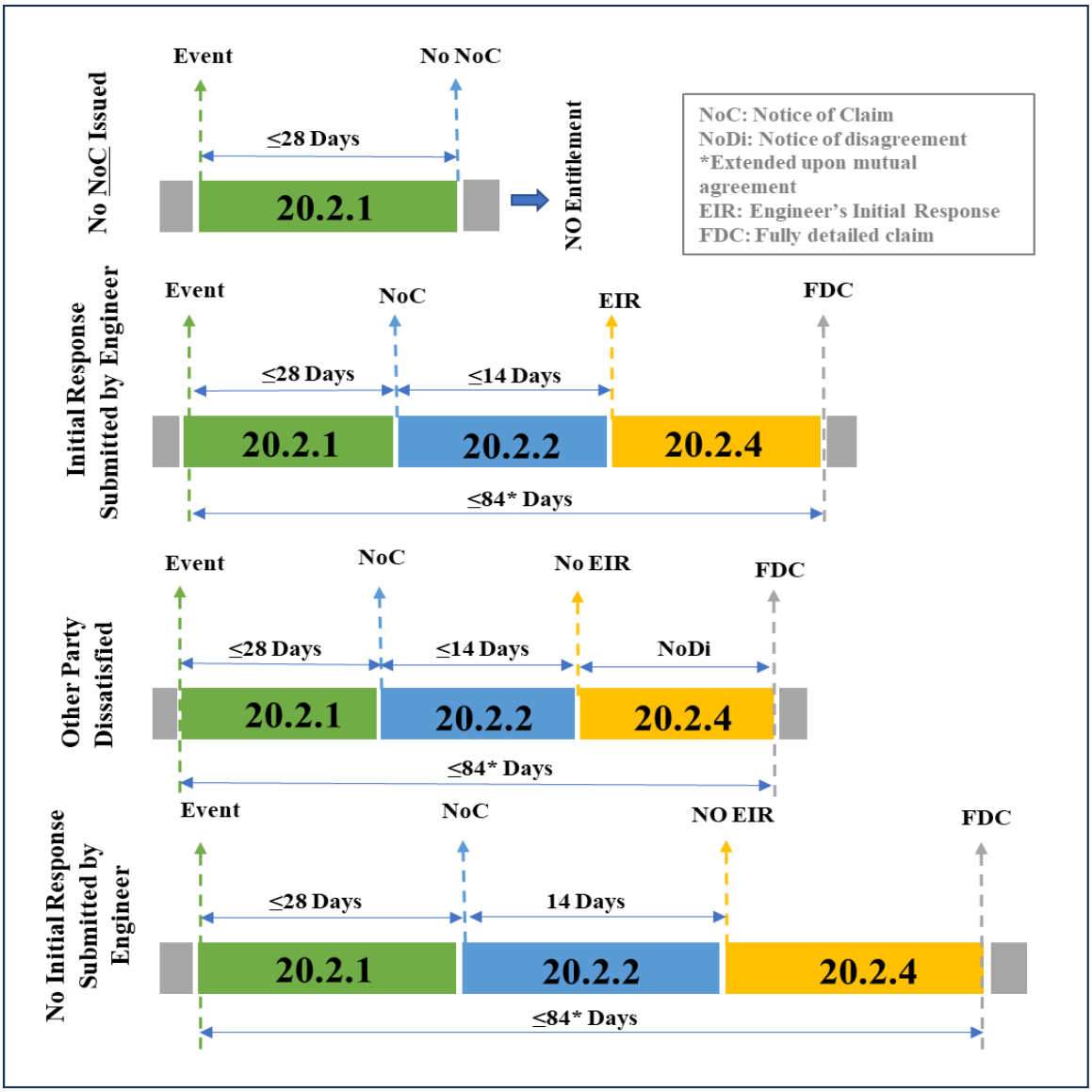



***Figure 5: Claims Disclosure and Notification Frameworks in FIDIC***

### 4.2 Engineer's Role in Claims

Examined changes in the engineer's role in resolving claims over the editions of FIDIC have been focused on enhancing neutrality and credibility. In FIDIC 1987, Clause 67 gave ample power to the engineer regarding claims wherein they acted as a consultant for the employer and as a deciding authority (Fawzy & El-adaway, 2012; Jagannathan & Delhi, 2020). This duality was problematic for two reasons: first, the engineer's recommendations were assumed to privilege the employer's position (Barakat et al., 2020). This eradicated the contractor's confidence in the claims process,

and there were disputes (Do et al., 2022; Hardjomuljadi, 2020). The problem was addressed in the 1999 edition of FIDIC, which limited the engineer's discretions and encouraged the public rendering of more decisions (Assaad & Abdul-Malak, 2020; Riaz et al., 2023). However, the very role of the engineer as an independent person who works for the employer disturbed the idea of neutrality (Barakat et al., 2019; Kandel et al., 2023). In turn, FIDIC 2017 introduced Clause 3.7, which obligates the engineer to be impartial when evaluating the claims (Elshamy et al., 2024; Kalogeraki & Antoniou, 2024). This clause recasts the engineer's role to include making decisions without prejudice, thus improving the level of trust among all the stakeholders (Abdul-Malak et al., 2024; Gamage et al., 2024). Establishing the emphasis on neutrality, FIDIC 2017 complies with the best practices worldwide and encourages the parties' cooperation during the dispute resolution process (Cevikbas et al., 2024; Kisi et al., 2020). Also, the engineer's role change enhances procedural rationality by improving the project flow and reducing conflicts (Barakat et al., 2020; Fawzy & El-adaway, 2012). This progression supports the importance of neutrality in the outcome of construction claims management (Gamage et al., 2024; Zhao, 2022).

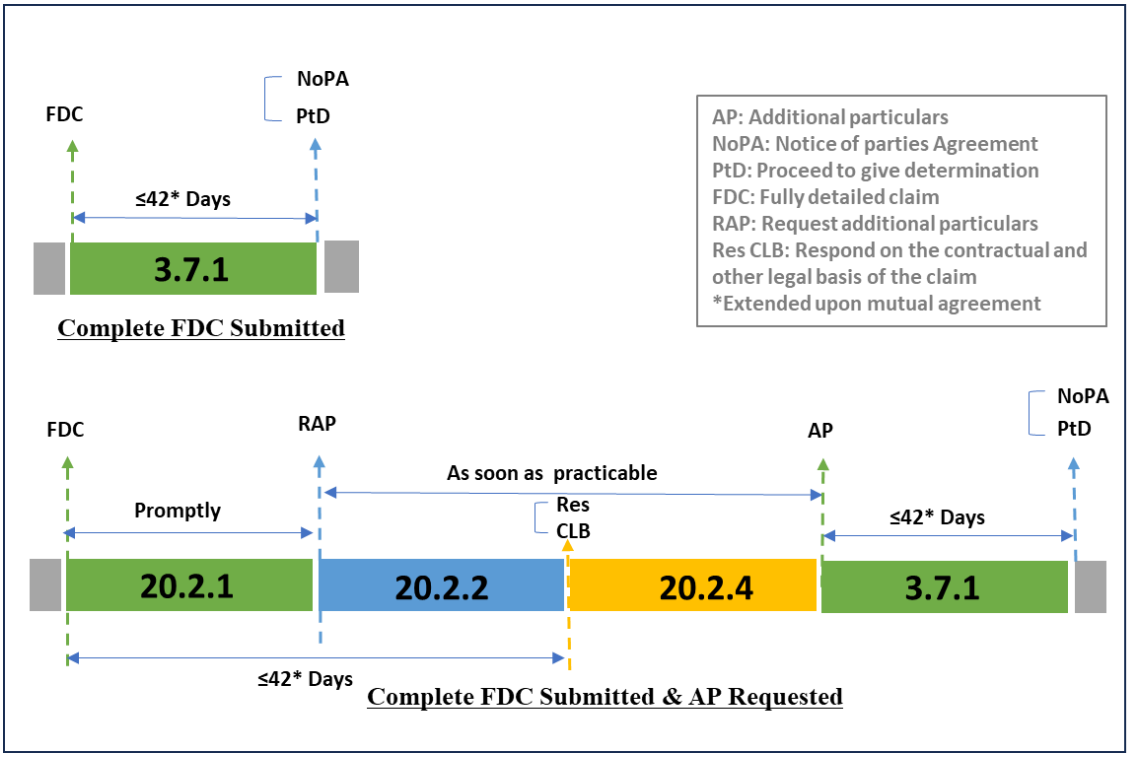



***Figure 6: Engineer's Role in Claims***

### 4.3 Dispute Adjudication Board (DAB)

The commitment to effective and efficient early warning systems involves adopting and promoting the Dispute Adjudication Board (DAB) within FIDIC contracts. However, DAB is not part of the FIDIC 1987 edition as disputes were resolved through arbitration, delays in the progress of the project, and associated expenses were likely to increase (Gad et al., 2011; Thi Hoa, 2022). This absence of an intermediate way to solve conflicts would often push simple misunderstandings into protracted legal trials (Barakat et al., 2019; Kisi et al., 2020). On a converse note, Clause 20.2 under FIDIC 1999 has employed the DAB in making final but bound, and therefore, avoid arbitrage within a limited period to be final and more straightforward to conclude (Barakat et al., 2020; Hardjomuljadi, 2020). This was a significant improvement, but since DAB appointments were made ad hoc, absence to avoid conflicts (Cevikbas et al., 2024; Riaz et al., 2023) was constrained by delay in their interaction. According to Clause 21.1 (Abdul-Malak & Senan, 2020; Fawzy & El-adaway, 2012), the substitution of the DAB by the Dispute Avoidance/Adjudication Board (DAAB) was done by the FIDIC 2017 edition to address this issue. Continuously, the DAAB is offering recommendations for the lack of conflict and good cooperation among the stakeholders (Gamage et al., 2024; Kalogeraki & Antoniou, 2024). Mirroring, this also fits within the context of international practices in construction dispute regulation of prevention over resolution (Elshamy et al., 2024; Zhao, 2022). Through this, there is constant involvement to minimize interruption and get fair remunerations, hence boosting the productivity of the project (Hardjomuljadi, 2020; Kandel et al., 2023). Related RISK management solutions from FIDIC 1987 to FIDIC 2017 are a transformation from a less preventive and less efficient to a more efficient dispute resolution strategy (Barakat et al., 2020; Kisi et al., 2020).

### 4.4 Referral of Disputes

The procedure for referring to disputes in FIDIC contracts has been given a new shape to increase efficiency and the objective of fairness. In the FIDIC 1987, disputes were referred to arbitration after the engineer's decision by Clause 67, and this often caused protracted and expensive processes (Barakat et al., 2020; Gad et al., 2011). This direct access to arbitration eliminated traditional ways of resolving disputes at a lower level, escalating confrontation between parties (Jagannathan & Delhi, 2020; Kisi et al., 2020). Realizing these constraints, FIDIC 1999 provided

a systematic procedure by making disputes to be taken to the DAB under Clause 20.4 (Barakat et al., 2019; Hardjomuljadi, 2020). In binding decisions, the aggrieved party could appeal within 28 days to ensure that the issues concerned are resolved as soon as possible, but also to give the parties a chance to complain about the decision made (Abdul-Malak & Senan, 2020; Cevikbas et al., 2024). FIDIC 2017 built on this with the Dispute Avoidance/Adjudication Board (DAAB) under Clause 21 and is active throughout the project lifecycle (Elshamy et al., 2024; Riaz et al., 2023). While DAB is more adversarial, the DAAB gives ongoing advice to avoid developing contentious issues, thus promoting cooperation (Gamage et al., 2024; Kalogeraki & Antoniou, 2024). Therefore, the referral provisions in FIDIC 2017 provide that the lowest level of dispute resolution is achieved, which fits well with the contemporary development of ADR (Fawzy & El-adaway, 2012; Kandel et al., 2023). In case of non-compliance with the decisions of the DAAB, arbitration remains the last resort to maintaining the balance of intermediate binding decisions and final remedies. As a result of structured referrals, FIDIC 2017 reduces unnecessary costs and time while balancing and being transparent.

### 4.5 Amicable Settlement

Arbitration clauses present in FIDIC contracts also provide an amicable settlement of disputes. According to FIDIC 1987, FIDIC 1987 did not have a provision for an amicable solution to disputes, and instead, the disputes, as a rule, will prefer to be referred to arbitration under Clause 67 (Barakat et al., 2020; Fawzy & El-adaway, 2012). Therefore, many disagreements were transformed into adversarial processes, resulting in time expenditures and increased. According to (Hardjomuljadi, 2020; Jagannathan & Delhi, 2020) a party shall try to come up with a final solution within 56 days after the date of the DAB's decision under FIDIC 1999 Clause 20.5. The negotiation and relationship with business were stimulated by this provision, meaning that it is moving towards ADR (Barakat et al., 2019; Cevikbas et al., 2024). FIDIC 2017, on the other hand, incorporated the mechanism in Clause 21.4 and added another 28 days of amicable settlement after DAAB's decision, although while FIDIC 2017 did so under Clause 21.4, in Clause 67 of the 1999 FIDIC contract, it did it. This is associated with the contemporary project management procedure; thus, the disputes can be solved without dramatically impacting the project. FIDIC 2017, therefore, underlines dialogue and negotiation as ways of improving problem-solving without damaging the reduction of several adversarial approaches, which often prevailed in the previous version (Fawzy

& El-adaway, 2012; Kandel et al., 2023). Generally, the literature on international commercial arbitration shows that efficient amicable settlement mechanisms can limit the number of arbitration cases without violating all parties' time and costs. This aligns with the global phenomena that urge non-adversarial approaches to conflict resolution (Cevikbas et al., 2024; Kandel et al., 2023).

### 4.6 Final Dispute Resolution (Arbitration)

Arbitration has always been the final stage of dispute resolution in FIDIC contracts, although it changed its function as an ultimate step to accommodate the intermediate stages. In FIDIC 1987, arbitration was the default method of dispute resolution after the engineer's decision, as provided by Clause 67 (Fawzy & El-adaway, 2012; Gad et al., 2011). This is especially true when it is applied in resolving more complex disputes, as it is usually associated with high costs and longer time spans than straightforward claims. Arbitration under Clause 20.6 of FIDIC 1999 was the last course of action available when the DAB and amicable settlement procedures were undertaken. This structure allowed disputes that have not been settled to be taken to arbitration, minimizing the pressure on the parties (Barakat et al., 2020; Cevikbas et al., 2024). FIDIC 2017 elaborated more on arbitration procedures under Clause 21.6, but the steps within this clause require the completion of DAAB and amicable settlement before proceeding to arbitration. This sequential approach enhances arbitration as a last resort, thus reducing unnecessary litigations (Elshamy et al., 2024; Gamage et al., 2024). Combined with intermediate measures, FIDIC 2017 achieves the legal enforceability of arbitration and adequately addresses the tasks of timely and efficient dispute resolution. Arbitration remains essential for legal and technical issues since it provides a final way of solving disputes and enforceability (Barakat et al., 2020; Hardjomuljadi, 2020).

### 4.7 Risk Allocation and Claims Handling

Risk distribution and claim management under FIDIC contracts are developed to enhance the balance and the procedures that govern construction project risk management. The two FIDIC 1987 had broad outlines to allocate contract risk and handling claims, with lots of freedom given to an Engineer in Clauses 66 and 67 (Abdul-Malak et al., 2024; Barakat et al., 2020). Especially for large projects, it results in ambiguous interpretations/differences. The time bar already existed but was more general, and a documentation procedure was incorporated in FIDIC 1999 under a

new Clause 20.1 for handling claims. The work became much more predictable but was not well received for its inflexibility in emergencies (Barakat et al., 2019; Zhao, 2022). Risk management and strict compliance with timeframes for the submitting of claims from contractors are also contained in the precedent editions of FIDIC customary, except that the previous editions of FIDIC have been enhanced in 20.2 and 21.1 of FIDIC 2017 standards, (Elshamy et al., 2024; Kalogeraki & Antoniou, 2024). DAAB incidentally also implemented disputes, which in turn only favors efficient and appropriate claiming management. In general, the change in the risk allocation regarding the project requirements in FIDIC 2017 reduces risks and leads to cooperation to achieve aimed results (Barakat et al., 2020; Hardjomuljadi, 2020). This aligns with the construction industry's tendency to manage risks in one way and prevent disputes in construction contracts.

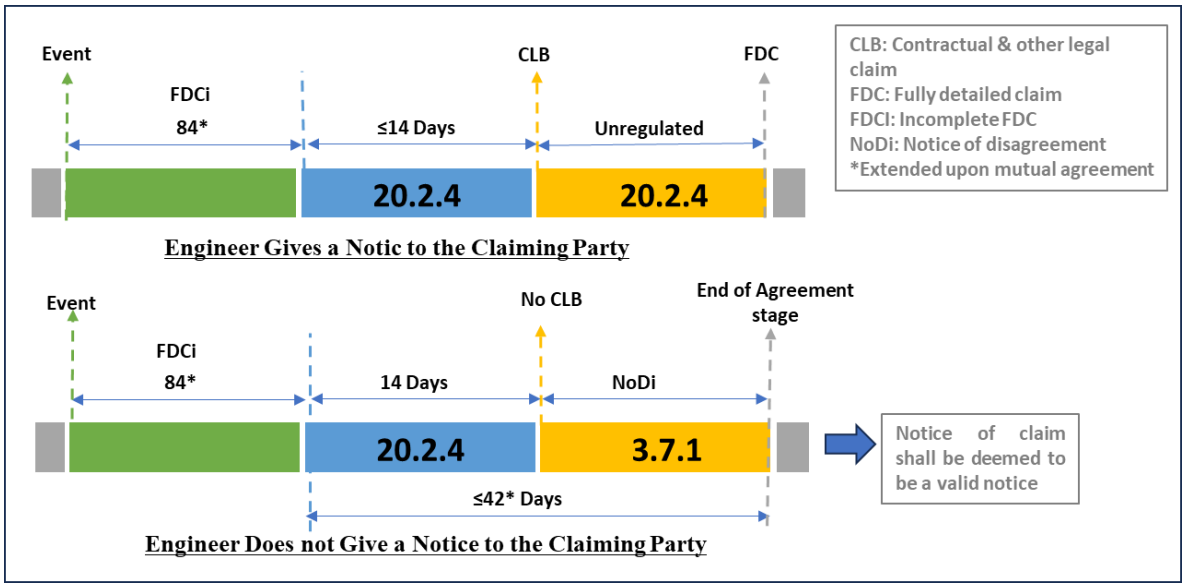


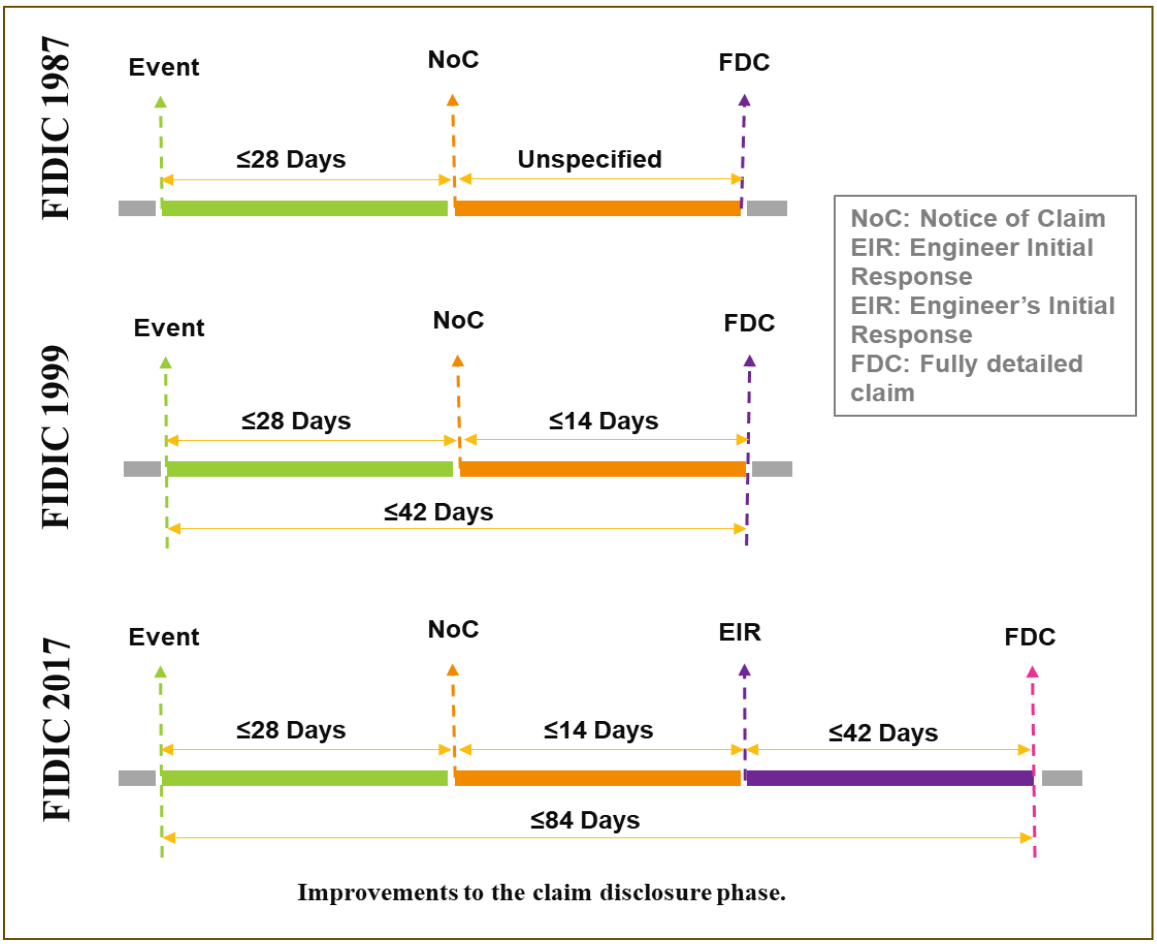

***Figure 7: Risk Allocation and Claims Handling***

## 4.8 Improvements

### *4.8.1 Improvements to the Claim Disclosure Phase*

The historical analysis of the development of the claim disclosure requirements in the FIDIC contracts demonstrates a gradual movement toward standardizing timeframes and enhancing work procedural time efficiency as shown in Figure 8. FIDIC 1987 failed because of missing time frames for subsequent procedures following the NoC, leading to controversies and possible time-

consuming processes (Abdul-Malak & Khalife, 2017). FIDIC 1999 has provided a structured timeline for the NoC to be submitted within 28 days and a fully detailed claim within 42 days to meet the requirement of clarity and predictability in the claim administration (Barakat et al., 2018). Including a 14-day engineer's initial response (EIR) added another layer of strength to the process because it involved the engineer right from the onset. The time scale was again fine-tuned in FIDIC 2017 by allowing as long as 84 days for the claim disclosure phase to cater to the project's requirements while remaining as procedural as possible (Elshamy et al., 2024; Godwin, 2020). The revised framework makes the process less likely to be challenged on procedural grounds, and hence, the risk of the dispute increasing due to such issues is minimized (Abdul-Malak & Senan, 2020).




Improvements to the claim disclosure phase.

***Figure 8: Improvement to Claim Disclosure Phase***

*4.8.2 Improvements to the Consultation and Determination Phases*

Major overhauls of the consultation and determination phases of FIDIC contracts also occurred due to the inefficiencies observed in earlier versions of FIDIC contracts as shown in Figure 9. The phases in FIDIC 1987 did not have a rigid time frame; therefore, claims payments emanated past the completion of the process with lags and mistakes (Mante, 2015). In essence, FIDIC 1999 was apparent in all aspects of getting into the consultation and determination business, 42-day period of being precise (no grey areas) and significant as this was the limitation of the engineer's responsibility (Barakat et al., 2019; Bunni, 2013). However, it was not easy to find a proper balance between consultation and determination activities within that timeframe. FIDIC 2017 has ensured 42 days for consultation and determination phases to address these challenges to ensure the process is more transparent and responsible (Godwin, 2020; Riaz et al., 2023)This improvement supports the rising tendency that firms in business are formalized in the contracting part of structured contract management and dispute resolution procedures in construction contracts (Barakat et al., 2020; Gamage et al., 2024).

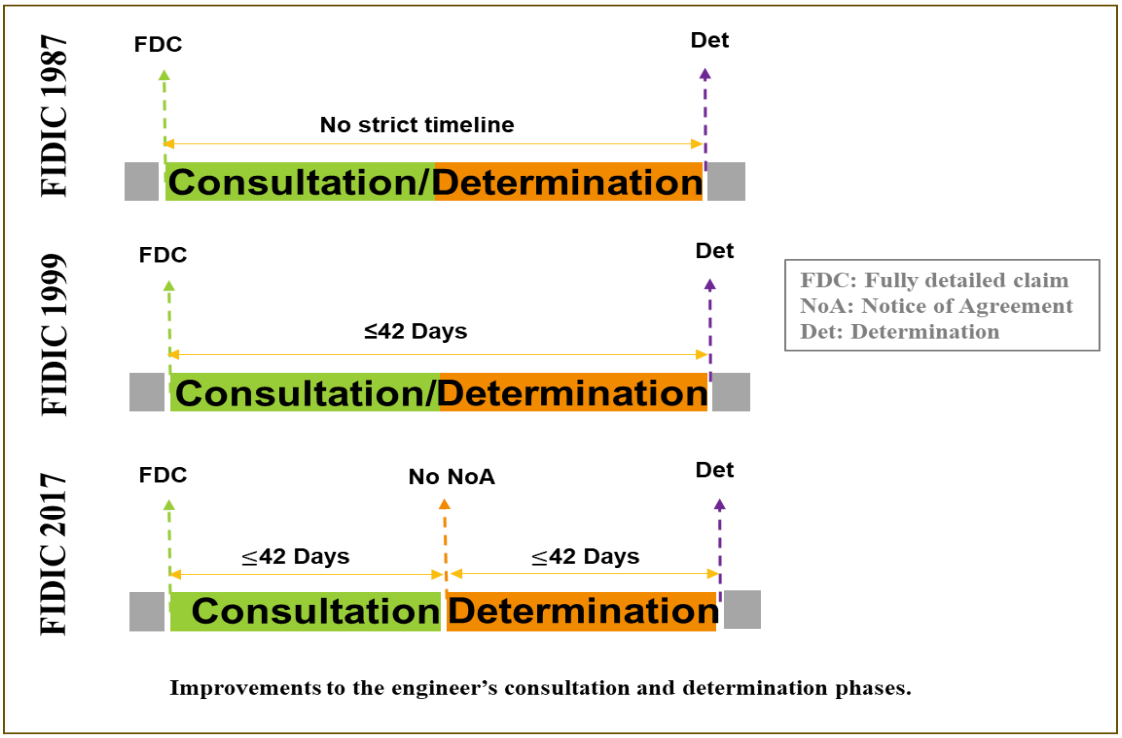



***Figure 9: Improvements to the Consultation and Determination Phases***

*4.8.3 Regulating the referral of disputes to adjudication*

Well, dispute resolution mechanisms existing FIDIC in 1987, 1999, and 2017 have grown significantly can be observed in Figure 10. It refers to the dispute between the Dispute Adjudication Board (DAB) in 1999 or the Dispute Avoidance/Adjudication Board (DAAB) in 2017 in both the 1999 and 2017 editions. This prevents disputes from escalating to more resolution methods as they deal initially with disputes at the project level. The determination phase follows, whereby the DAB or DAAB will make a binding decision unless one of the parties expresses dissatisfaction with it. Moreover, an important part of both editions is the Notice of Dissatisfaction (NoD), where a party disagrees with the determination and plans to proceed or is proceeding to further resolution mechanisms. The time for issuance of the NoD is shorter in FIDIC 2017 (ideally, within 28 days after the determination to be valid, sometimes shown as 28 days or two weeks from the determination to be valid), therefore providing less flexibility. Once the determination phase is over, if no satisfaction is found, there would be a dispute about arbitration as the last resolution step. However, under the 1987 edition, disputes were directly escalated to arbitration without the benefit of an intermediate adjudication step, and quite often, the legal proceedings were prolonged and expensive. Nevertheless, the introduction of the DAB in 1999 and its subsequent transformation in 2017 into a law on structuring the dispute resolution mechanism, the DAAB, laid a structured mechanism for dispute resolution. This also indicates stricter compliance requirements than in the 1999 edition, due to which the DAAB decisions in FIDIC 2017 are binding, except in case they have been overturned in arbitration.

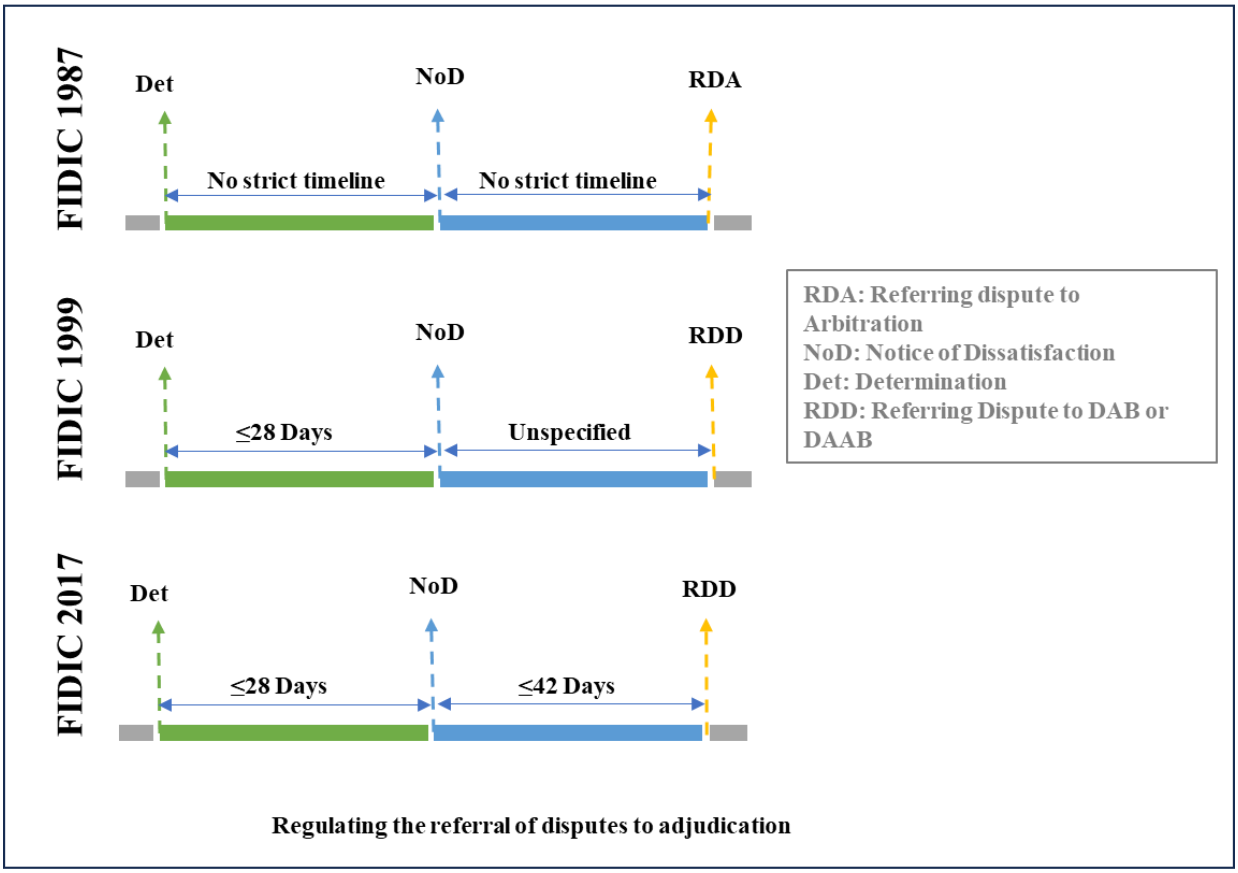



***Figure 10: Regulating the referral of disputes to adjudication***

*4.8.4 Reduced period for amicable settlement*

The dispute resolution process is represented in graphical form and comprises two main stages: the Notice of Dissatisfaction (NoD) and the initiation of arbitration. It shows when the party must invoke formal arbitral proceedings if the dispute has not been settled by other preceding means. In the 2017 edition, parties had only 182 days to open final proceedings after the NoD was served, compared to no time limit in the 1999 edition. The changes show FIDIC's desire to resolve disputes more efficiently and clear short delays in claim settlements. The evolution of FIDIC's dispute resolution framework as shown in Figure11 is about moving away from direct arbitration (1987) to a lengthy, multi-tiered system that emphasizes enforceability, quick decisions, and a finite

period. The intent of the stricter time bars and expanded authority of the DAAB in the 2017 edition is to dilute the burdens of a protracted legal dispute.

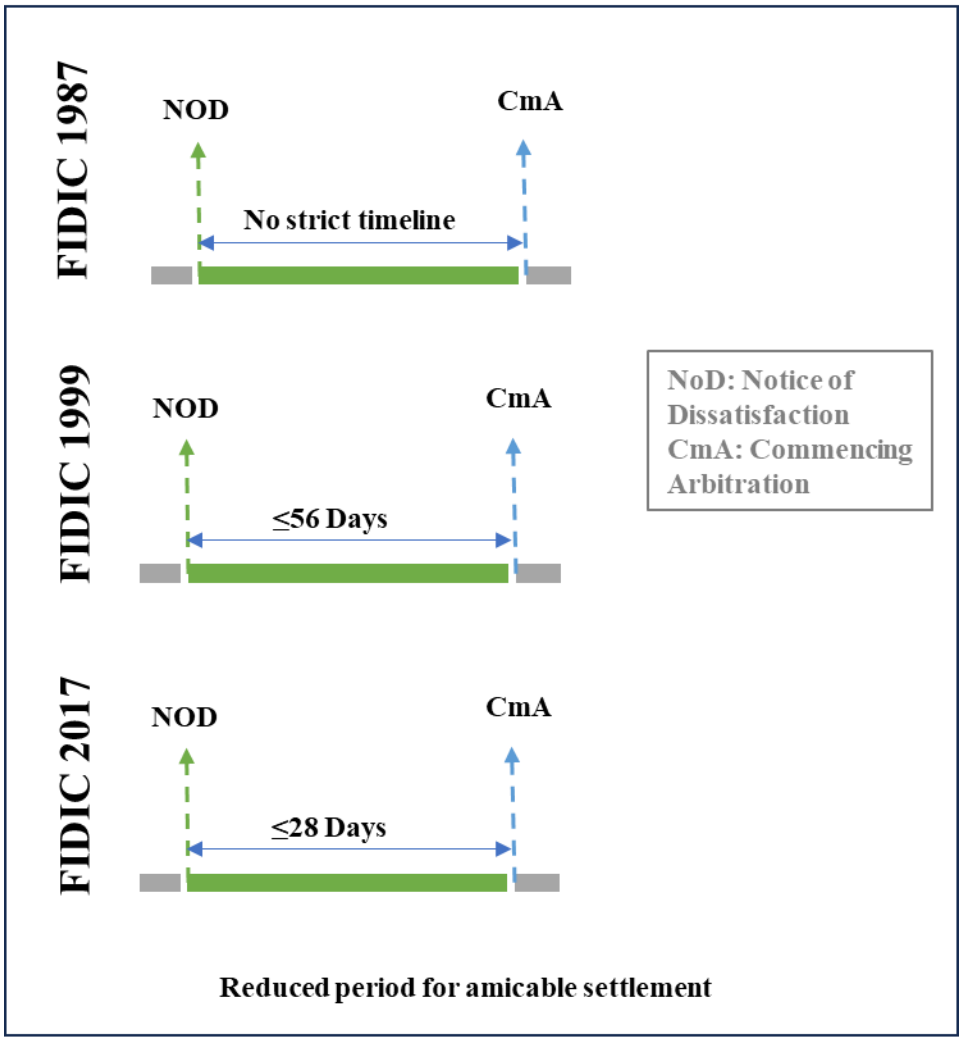



***Figure 11: Reduced period for amicable settlement***

### 4.9 Comparison of Claim and Dispute Resolution Mechanism

Table 4-1 presents key findings of comparison of Claim and Dispute Resolution Mechanism Provisions in FIDIC 1987, FIDIC 1999, and FIDIC 2017, including references to the relevant clauses:

***Table 4- 1: Comparative Analysis of Claim & Dispute Resolution***

| Provision | FIDIC 1987 | FIDIC 1999 | FIDIC 2017 |
|---|---|---|---|
| Claims Notification Period | There is no specific timeline for notifying claims. | Clause 20.1: Notice of claim within 28 days after the event giving rise to the claim. | Clause 20.2: Contractor must provide notice of claim within 28 days. Failure to notify results in claim dismissal unless justified. |
| Engineer's Role in Claims | The engineer decides claims with broad discretion under Clause 67. | Clause 20.1: The engineer determines claims with less discretion than in 1987. | Clause 3.7: Engineer required to act neutrally when determining claims. |
| Dispute Adjudication Board (DAB) | Not included in this edition. | Clause 20.2 introduces the Dispute Adjudication Board (DAB) to provide dispute decisions. | Clause 21.1: Dispute Avoidance/Adjudication Board (DAAB) is required to be appointed throughout the project. |
| Referral of Disputes | Disputes go directly to arbitration under Clause 67. | Clause 20.4: Disputes are referred to the DAB before arbitration. DAB decisions are binding unless challenged within 28 days. | Clause 21.4: Disputes are referred to the DAAB, with decisions binding unless contested within 28 days. |

| | | | |
|---|---|---|---|
| Amicable Settlement | There is no formal requirement for amicable settlement; disputes generally proceed directly to arbitration. | Clause 20.5: Parties must attempt an amicable settlement within 56 days after the DAB's decision, failing which arbitration is allowed. | Clause 21.4: Parties must engage in 28 days of amicable settlement before arbitration. |
| Final Dispute Resolution (Arbitration) | Arbitration is the final step after the Engineer's decision under Clause 67. | Clause 20.6: Arbitration follows if either party is dissatisfied with the DAB's decision. | Clause 21.6: Arbitration can be initiated after DAAB, and amicable settlement procedures are exhausted. |
| Risk Allocation and Claims Handling | General provisions have less structure in claims handling and risk allocation (Clauses 66, 67). | Clause 20.1: More structured process for claims handling, introducing timelines and claim requirements. | Clause 20.2 & 21.1: Detailed, prescriptive procedures emphasizing dispute avoidance and adherence to claim submission and resolution timelines. |

### 4.10 Comparative Flowchart of Claim Events Under FIDIC 1987, 1999, and 2017

The following flowchart Shown in figure 12, this comparative overview gives a gloss on the events that make up a claim under FIDIC 1987, 1999 and 2017. It shows the procedure of notification of claim, determination and dispute settlement in detail; it shows procedural differences and the progress in contractual obligations during the three editions.

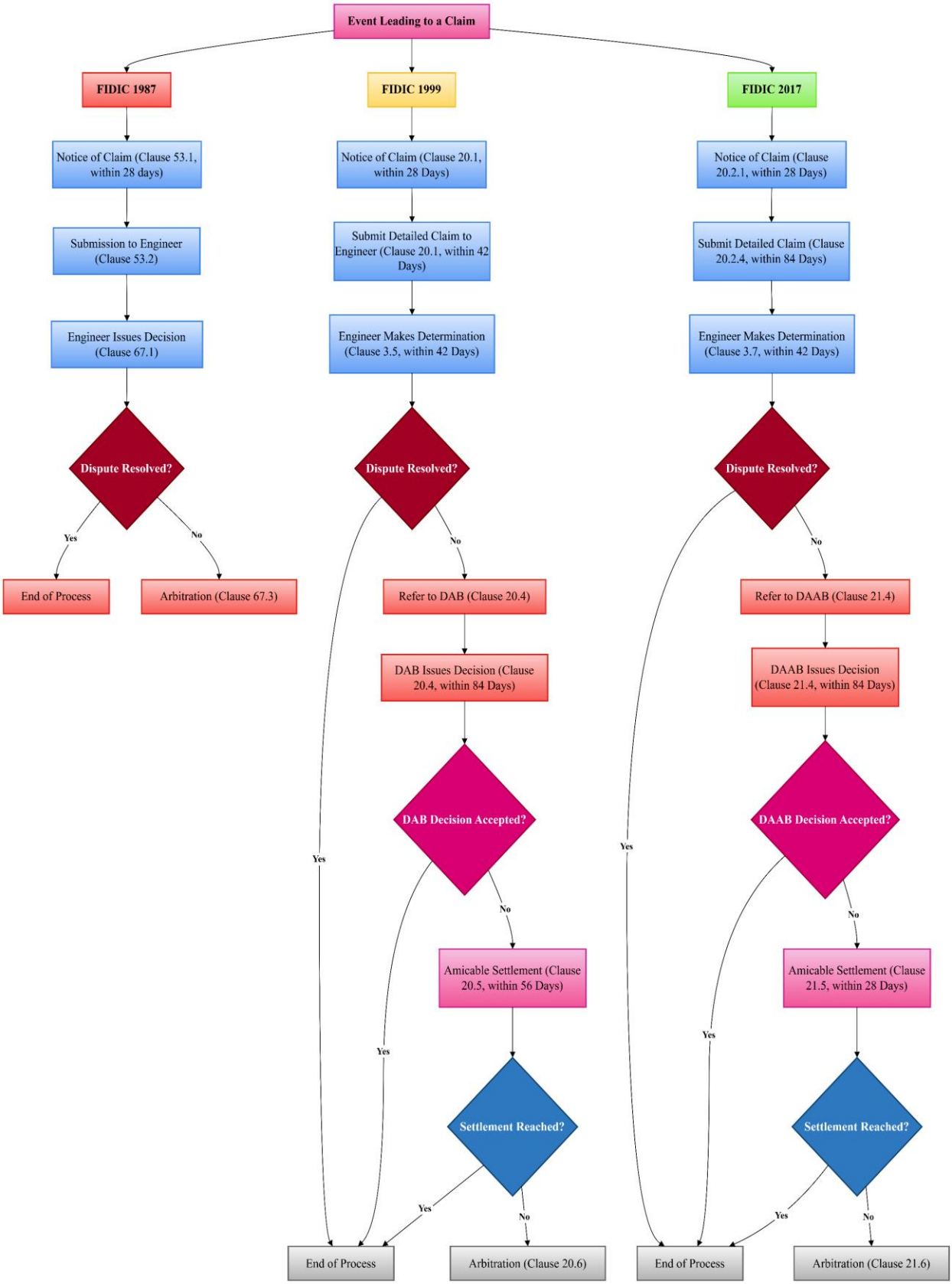



***Figure 12: Event Leading to Claim Under Each Edition***

*4.10.1 Event Leading to Claim in 1987*

The flowchart outlines the evolution of claims and dispute resolution mechanisms in the FIDIC 1987, 1999, and 2017 editions. In the FIDIC 1987 Red Book, the process begins when an event occurs, prompting the contractor to notify the Engineer of the claim within 28 days (Clause 53.1). The contractor must then submit detailed particulars of the claim to the Engineer (Clause 53.2), who is responsible for issuing a decision (Clause 67.1). If the dispute is not resolved at this stage, it is referred directly to arbitration (Clause 67.3), as no intermediate adjudication mechanism exists.

*4.10.2 Event Leading to Claim in 1999*

The FIDIC 1999 edition introduced the Dispute Adjudication Board (DAB) as an intermediary in the resolution process. Following an event, the contractor must notify the Engineer within 28 days (Clause 20.1) and submit a detailed claim within 42 days. The Engineer has 42 days to decide (Clause 3.5). If the claim remains unresolved, it is referred to the DAB (Clause 20.4), which issues a decision within 84 days. If either party rejects the DAB's decision, they must engage in amicable settlement discussions lasting up to 56 days (Clause 20.5). Failing a resolution, the dispute proceeds to arbitration (Clause 20.6).

*4.10.3 Event Leading to Claim in 2017*

The FIDIC 2017 edition further refined the process by introducing the Dispute Avoidance/Adjudication Board (DAAB), emphasizing dispute avoidance and resolution. Like the 1999 edition, the contractor must issue a notice of claim within 28 days (Clause 20.2.1) and submit a detailed claim within 84 days (Clause 20.2.4). The Engineer is required to issue a determination within 42 days (Clause 3.7). In the case of an unresolved claim, the claim may be referred to the DAAB, which shall be decided in 84 days (Clause 21.4). If either party is dissatisfied with the ruling of the DAAB, the parties engage in amicable settlement negotiations for up to one month (21.5). Disputes not settled are taken to arbitration (Clause 21.6). These changes result from FIDIC’s attempts to enhance efficiency and fair business in claims and disputes. While the 1987 version relies solely on the Engineer and arbitration, the 1999 and 2017 versions add independent

adjudication boards, the DAB and DAAB; the 2017 version pays even more attention to dispute avoidance and faster procedures.

### 4.11 Thematic Analysis

The thematic analysis of the three FIDIC editions (1987, 1999, and 2017) illustrates a progressive evolution in claim and dispute resolution mechanisms. The FIDIC 2017 edition offers enhanced clarity and enforceability compared to its predecessors. This improvement is attributed to introducing Dispute Avoidance/Adjudication Boards (DAABs) and more detailed provisions for managing claims and disputes (Abdul-Malak et al., 2024; Barakat et al., 2020).

While FIDIC 1987 provided a basic framework with limited flexibility, the 1999 edition introduced Dispute Adjudication Boards (DABs), marking a significant step forward in dispute resolution processes (Jagannathan & Delhi, 2020). However, the 2017 edition's transition to DAABs further strengthened these mechanisms by focusing more on dispute avoidance alongside resolution (Cevikbas et al., 2024).


***Figure 13: Interview Word Cloud***

Word clouds are visual tools used to represent the frequency of words in the text, with the size of the words representing their frequency in the text as shown in Figure 13. This makes it an effective way to find the larger words, which means higher words that signify higher usage, identifying key themes and recurring terms in interviews. In this instance, words showing at least five times are highlighted.

***Table 4 - 2: Description of Themes with Their Respective codes***

| Name | Description |
|---|---|
| **Enhancing Dispute Resolution Processes** | This theme emphasizes opportunities for improving dispute resolution, focusing on clarity, procedural efficiency, and insights drawn from practical experiences. |

| Name | Description |
|---|---|
| Clarity and Enforceability of FIDIC 2017 | |
| Effectiveness of Dispute Resolution Frameworks | |
| Impact of DABs and DAABs | |
| Role of Technology in Dispute Management | |
| **Evolution of Claim and Dispute Resolution in FIDIC Contracts** | This theme focuses on how FIDIC frameworks have evolved across editions and their impact on contractual practices, particularly in claims and dispute management. |
| Evolution of Claims & Dispute Handling | |
| Evolution of Claims Management | |
| Lessons from Real-world Cases | |
| Professional Background & FIDIC Experience | |
| **Future Directions and Innovations** | This theme investigates potential improvements to FIDIC frameworks, focusing on the role of technology in enhancing claims management and dispute resolution. It also explores how future FIDIC editions may incorporate lessons from real-world cases and emerging trends. |
| Future Evolution of Dispute Resolution | |

| Name | Description |
|---|---|
| Role of Technology in Dispute Management | |
| Suggestions for Improvement | |
| **Practical Challenges of Claims and Dispute Resolution Mechanism** | This theme focuses on stakeholders' difficulties adhering to claims-related clauses and dispute-resolution mechanisms. It also highlights the practical challenges contractors and employers face when dealing with claims and disputes, including procedural and resource-related issues. |
| Challenges in Compliance | |
| Challenges in Implementing Dispute Frameworks | |
| Common Causes of Claims | |

The analysis of the coding of the first respondent's input into the evolution of the claims and dispute resolution in FIDIC contracts is presented in Fig 14. Different coding categories are represented on the x axis and the percentage of the coverage on the y axis. 'Evolution of Claims' has the highest coverage (approx. 27%), suggesting that the respondent has extensively debated how claims management evolved over such editions of FIDIC.' About 24-25% of it is devoted to 'Future Directions and The Improvement of Existing Mechanisms' which also shows a big interest in improving the existing mechanisms. "There is moderate coverage for "Practical Challenges", "Moderately Positive and Negative Views" and "Future Evolution of Claims" with percentages ranging from 10-18%." Thus, it suggests the respondent indicated he was aware of the benefits and drawbacks of dispute resolution mechanisms in FIDIC contracts. Continuing with "Challenges in Compliance," "Role of Technology in Claims," along with "Lessons from Real World Cases" have a lesser percentage of coverage about 5 to 7 percent, meaning that although these issues were addressed, they were not given such high priority. 'Effectiveness and Impact of DAABs,' 'Clarity and Enforceability,' and 'Suggestions for Improvement' is the least covered themes among 38

percent, which give an indication that there must be a further investigation in these areas. The results suggest that claim evolution and future improvements are the areas of concern in resolving FIDIC disputes. Now, however, DAAB's enforceability is discussed more than the other topics like compliance issues, technological developments, etc. The positive side of reform in FIDIC contracts is described whereas the negative side of reform is indicated by the balanced discussion of the problems of claims management. Further information about the building trends that may help validate these trends and reveal other aspects of the changing world of claims and dispute resolution in FIDIC contracts are being responded to by multiple experts in the future.

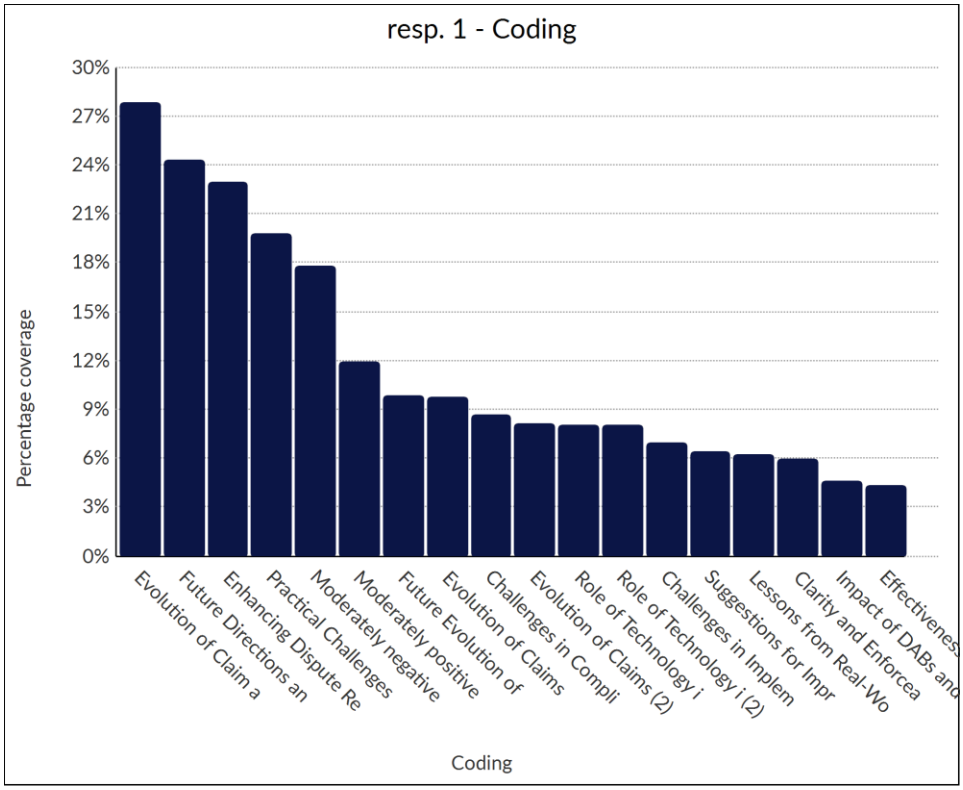



***Figure 14: Coding Analysis of First Respondent***

The coding analysis of the second respondents' input on the evolvement of claims and dispute resolution in FIDIC contracts is as presented in Figure 15. The most covered topic is 'Evolution of Claims' (32%), which is supporting the fact of how claims management has evolved from one FIDIC edition to another. The order of importance of these two things is as follows: 21% for 'Enhancing Dispute Resolution' which shows interest in improving dispute resolution mechanisms. We observe moderate coverage for 'Practical Challenges', 'Future Directions' and 'Moderately

positive and negative views' (10–15%) which indicates a balanced view of FIDIC's strengths and weaknesses. Procedural and technical complexities are known through themes such as "Challenges in Compliance", "Professional Background", and "Evolution of Claims (7-9%). 'Structural change in settlements' is covered at (5 to 7) %, 'Impact of DAAB' and 'Effectiveness of Dispute Resolution' are noticed with (5 to 7) % lower coverage, indicating that these were of secondary importance. The "3" to "5" percent is the Least discussed topics which are: "Role of Technology, "Common Causes of improper Claims, and "Suggestions for improvement." However, the respondent weighs less on technology adoption, DAAB effectiveness and compliance problems; the most important are claim evolution and dispute resolution improvements. We further suggest that DAAB is a product worth investigating further in terms of effectiveness, compliance issues and the roles of new technologies for claims management.

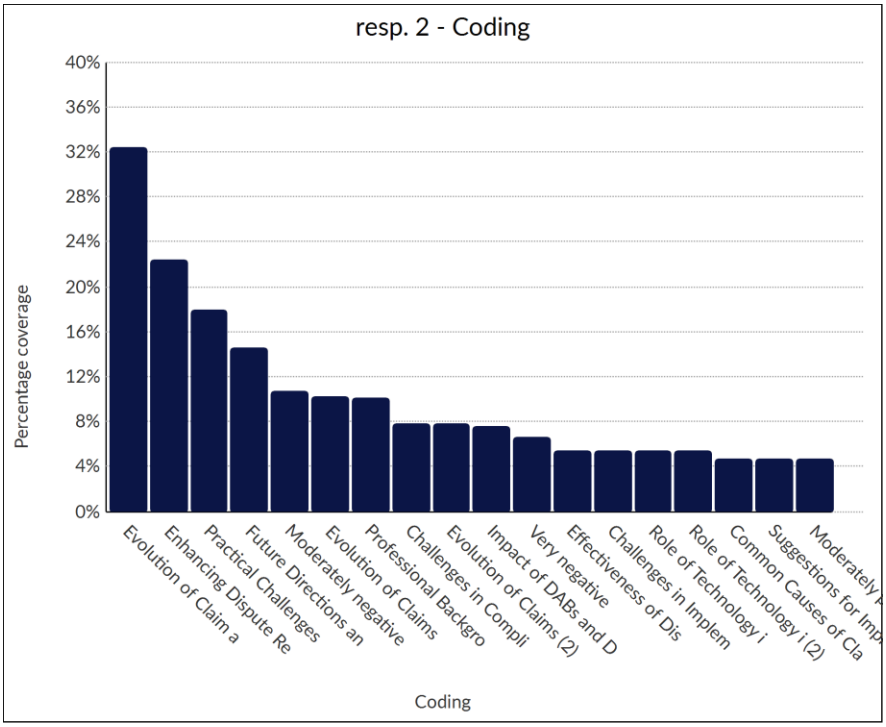



***Figure 15: Coding Analysis of Second Respondent***

This latter coding analysis of Respondent 3's input in the context of FIDIC claims and dispute resolution is illustrated in Figure 16. As expressed in highest coverage, which is "Future Directions", 27% and "Enhancing Dispute Resolution", 26% showing strong emphasis on claim and dispute management. The second top rated item is 'Evolution of Claims' (22%) this shows the

respondent's interest in how FIDIC claims have evolved in relation to each edition. Instrument's view is moderately positive, moderate negative perspectives and moderate coverage (10–15%) of 'Practical Challenges', correspondingly show that the perspective on FIDIC's mechanisms is balanced. Observed some recognition of the claim to Potential in the use of Role of Technology (9 %). It is "Suggestions for Improvement," "Lessons from Real World Cases," and "Future Evolution of Claims" that have lower coverage (6-8%). The 'challenges in implementation ' (4-6%), 'effectiveness of DAABs ' (4-6%), 'clarity and compliance enforcement ' (4-6%) are the least discussed topics. The respondent focuses more on future improvement and dispute resolution than DAAB effectiveness and compliance enforcement, implying that these issues are far from being properly tackled.

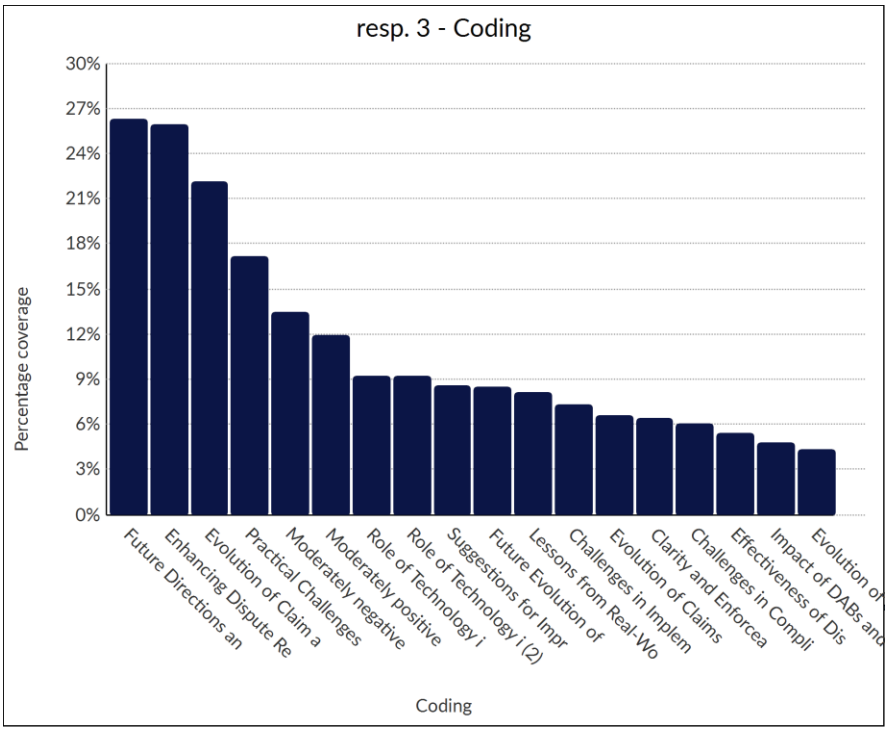



***Figure 16: Coding Analysis of Third Respondent***

This bar chart in Figure 17 indicates the coding categories for Respondent 4, and how many percentages of each theme were covered. The term having the largest percentage coverage by the category 'Evolution of Claims' shows that this topic was of major importance for the response. There are also the themes, "Professional Background", with moderate coverage 15%-25%, and "Future Directions and Enhancing Dispute Resolution," with the same coverage rate. Topics as

little discussed or emphasized include "Challenges in Compliance," "Very Negative Feedback" and "Clarity and Suggestions." This chart clearly tells us what respondent gives the most focus to, which is clearly the claims evolution and related themes.

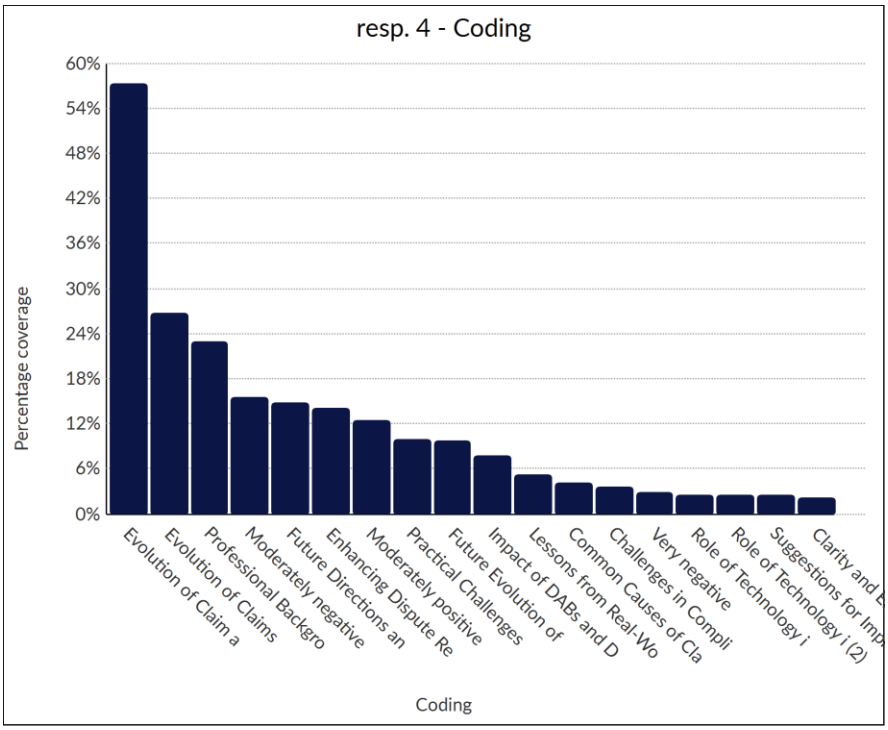



***Figure 17: Coding Analysis of Fourth Respondent***

The bar chart in Figure 18 uses this coding as we see in Respondent 5 how much of the discussion is devoted to what themes. Almost a third of all the registries focus on “Improving the Dispute Resolution,” thereby clearly indicating a priority given to enhancing dispute resolution mechanisms. Also big are the coverage around 20–25% in 'Future Directions and Practical Challenges' and 'Evolution of Claims'. There are moderate representations in the form of other themes including "Challenges in Compliance" and "Common Causes of Claims", and minor representation in "Very Negative Feedback", "Effectiveness of Dispute Mechanisms" and "Suggestions for Improvement". It is evident that this discussion paid special attention to improvement strategies and claims evolution.

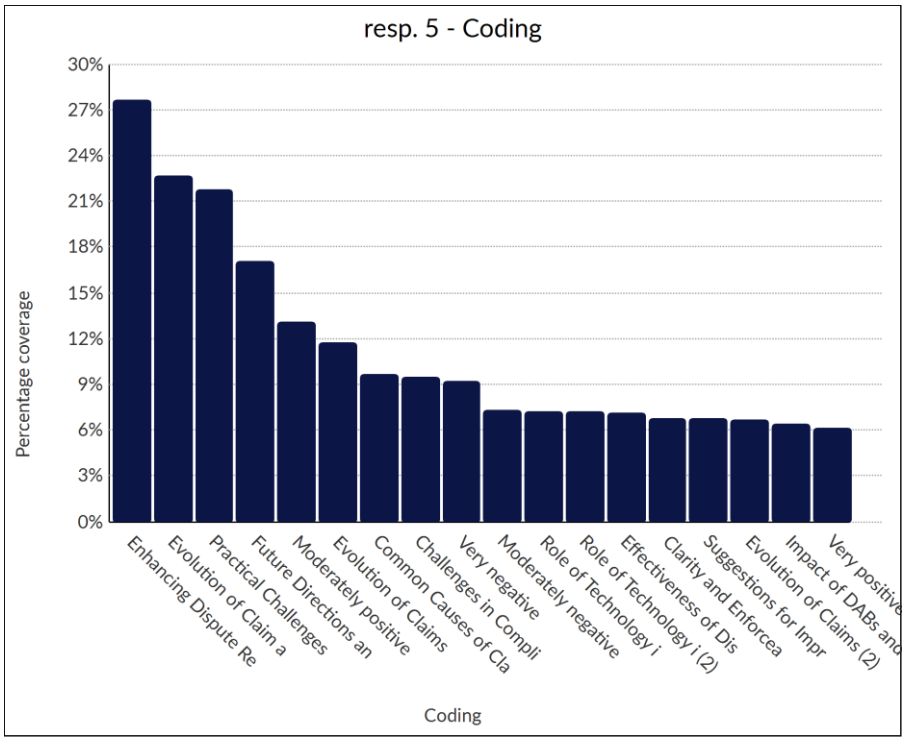



***Figure 18: Coding Analysis of Fifth Respondent***

Figure 19 represents the respondent 6 coding distribution along the bar chart represents the percentage coverage of different themes in discussion. Almost 27% of the claims sat in the category Evolution of Claims, which appears to be a major focus of interest. Almost 15% to 20% were devoted to "Future Directions and Enhancing Dispute Resolution," and "Practical Challenges." Upon theme, discussion of "Lessons from Real World Dispute Scenarios," "Suggestions for Improvement," and "Challenges in Compliance," took place, amounting to 10 – 12% of coverage. The responses to the sections of “Impact of DABs,” “Common Causes of Claims,” and “Clarity and Recommendations” were only 8% less frequently discussed topics, with less than 8% of the responses. Respondent 6 focuses primarily on claim evolutions and improvement in practical dispute resolution in this chart, combined with a balanced discussion of problems and suggestions.

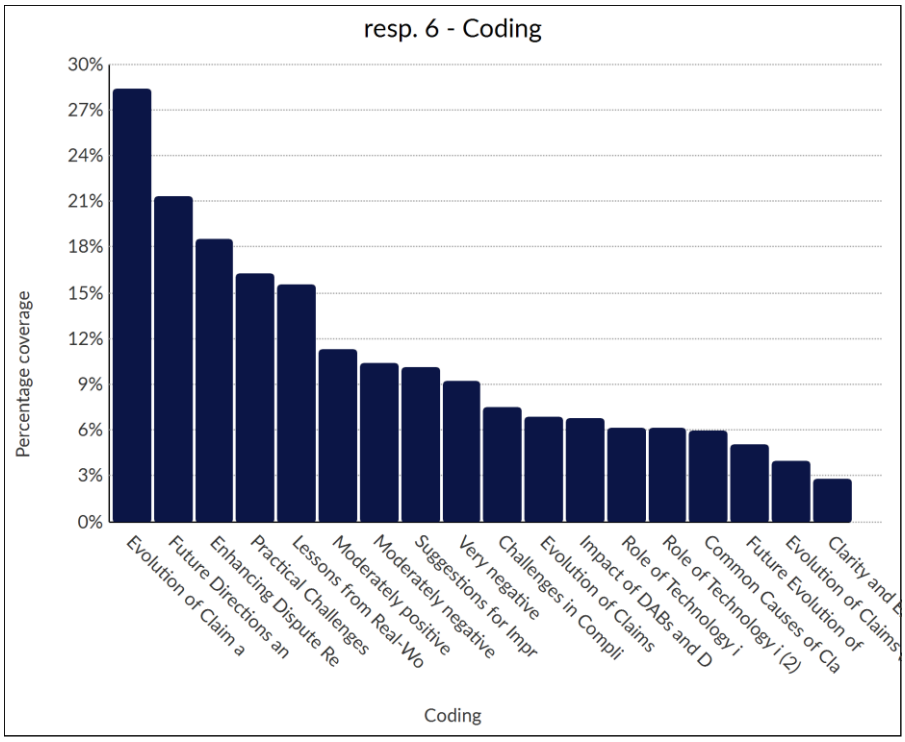



***Figure 19: Coding Analysis of Sixth Respondent***

The coding result for ‘resp. 7’ bar chart in Figure 20 shows what key themes in dispute resolution are. About 24% of the coverage is related to the most prominent theme “Enhancing Dispute Resolution,” 18 % relates to “Evolution of Claims” and 15 % indicates “Moderately Positive.” The latter two themes stress claim mechanism improvement and historical change of claim mechanism. The theme in the middle level (6-8%) is about "Future Directions," "Practical Challenges," "Effectiveness of Dispute Mechanisms," and "Impact of DABs" due to concerns with implementation challenges and effectiveness. Some themes that had less focus (3-4% frequency including "Lessons from Real World Cases," Role of Technology," and "Professional Background" if they appear at all indicate some relevance, but with lower emphasis. These aspects were likely not the main focal points based on minimal coverage of "Common Causes of Claims" and "Suggestions for Improvement". This is in line with the research on FIDIC dispute resolution mechanisms (1987, 1999, 2017) regarding evolution of claims and dispute resolution. While presenting the findings, they also point to shortcomings in technology and industry expertise to implement a project. This research has generated useful data for further research on the effectiveness of dispute resolution and for improvement.

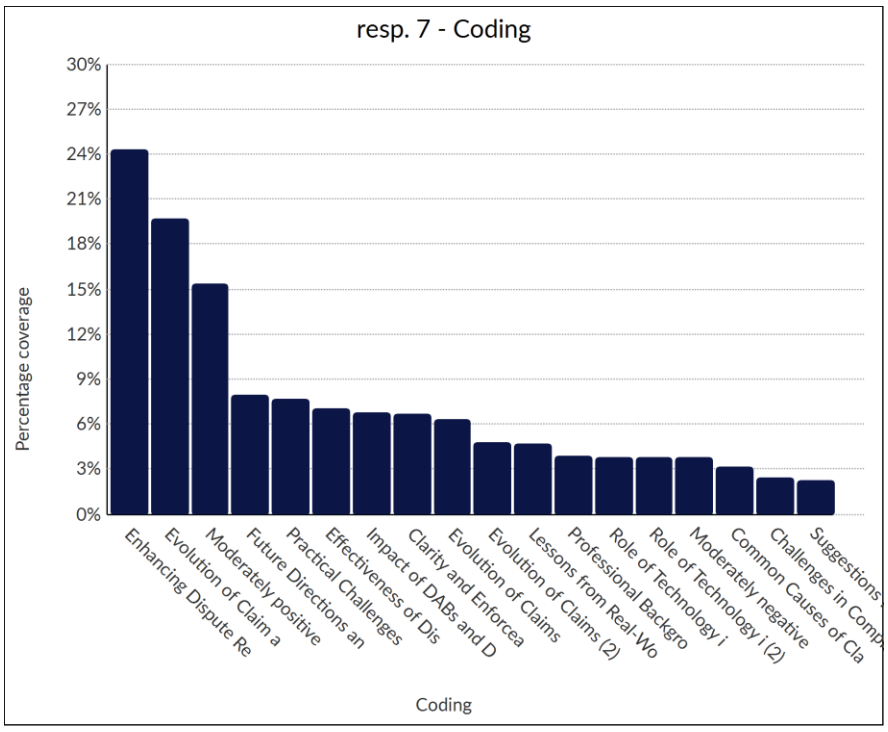



***Figure 20: Coding Analysis of Seventh Respondent***

The coding results for 'resp. 8' are presented as a bar chart in Figure 21, the themes included as themes identified from thematic analysis, and the corresponding proportion of total coverage is shown in the graph. Among the themes, "Evolution of Claims," takes up approximately 29% of the total coverage, emphasizing the progression of claim mechanisms. The two most attacked claims include "Enhancing Dispute Resolution" (24%) and improvement of dispute resolution processes. Other mentioned themes are “Very Positive” (19%), “Moderately Positive” (16%), “Moderately Negative” (14%), indicating also various views regarding to the usefulness of dispute resolution mechanisms. These themes (12 th - 13 th ) suggest moderate emphasis on the challenges that the rise in dispute resolution presents and on ways to improve this process. Each of these less frequently discussed themes accounts for about 2—8%: Revolution in Claims (2), Challenge in Compliance, Role of Technology and Professional Background. Less than 4 or 5 percent of them are “Lessons from Real Cases,” “Impact of DABs,” or “Effectiveness of Dispute Mechanisms.” The findings in this thesis are consistent with the thesis research that addresses the elements of a Claim Evolution, Improvements in Dispute Resolution and practical challenges of dealing with FIDIC Dispute Resolution Mechanisms (1987, 1999, 2017). It opens up possible avenues for

further research, in particular, in the context of compliance problems and the part played by technology in dispute settlement.

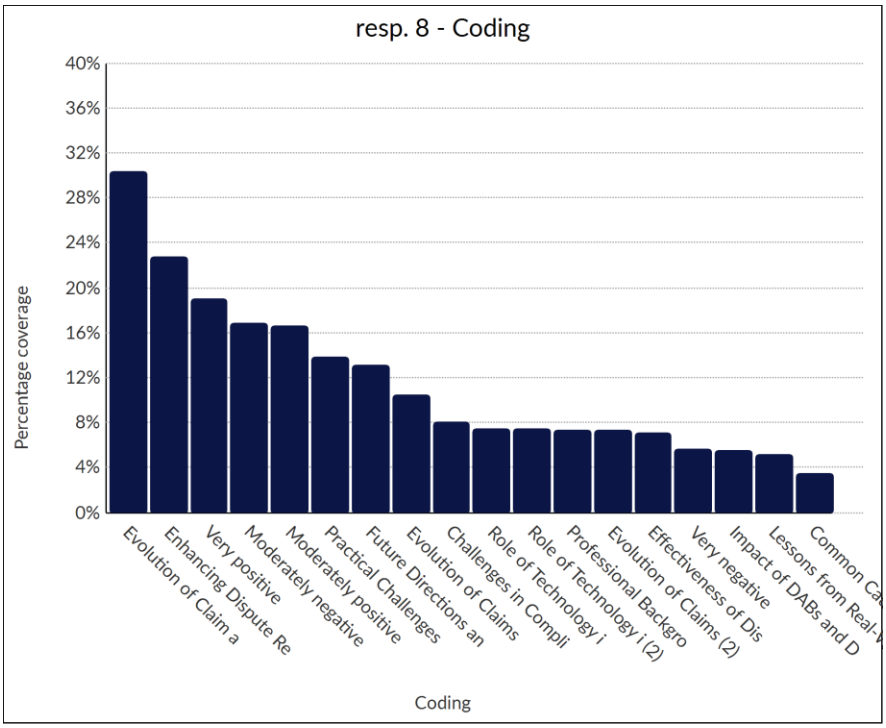



***Figure 21: Coding Analysis of Eighth Respondent***

## 4.12 *Sentiment* Analysis of Industry Experts

The NVivo sentiment analysis done on eight expert interviews reaped important perceptions about the FIDIC editions from the professionals. While FIDIC 2017 was recognized as a vast improvement over the previous forms, there are still problems. The issue of compliance with the notice requirement was identified as a negative aspect, as mentioned in the comments of Res. 4 and Res. 6 to practical implementation. On the other hand, using digital tools and technology in handling disputes was welcomed well, emphasizing the possibility of being a crucial area for future growth. The sentiment analysis results, supported by tabulated data, reinforced these findings: Very positive attitudes were highly related to the comprehensiveness and efficiency of DAAB provisions of FIDIC 2017; less positive attitudes were reported about implementation challenges, including conformity to the notice provisions and the establishment of DAABs; and both positive and negative attitudes were noted in areas where conventional practices meet new practices,

particularly in embracing new technologies. Such findings call for further research on implementation issues and support of technology-enhanced practice for optimizing the use of FIDIC frameworks.

***Table 4- 3: Sentiment Analysis of Interviews***

| Respondents | Negative | Slightly Negative | Neutral | Positive | Very positive |
|---|---|---|---|---|---|
| 1 | 1 | 2 | 14 | 7 | 3 |
| 2 | 4 | 3 | 5 | 2 | 3 |
| 3 | 1 | 1 | 7 | 5 | 2 |
| 4 | 4 | 2 | 23 | 18 | 3 |
| 5 | 4 | 3 | 2 | 5 | 3 |
| 6 | 4 | 0 | 5 | 7 | 0 |
| 7 | 0 | 1 | 1 | 3 | 1 |
| 8 | 1 | 2 | 6 | 5 | 6 |

Feedback from eight respondents and five categories has been provided in the data as seen in Table 4-3. Most of the respondents had a combination of both neutral and positive responses, with Respondent 4 having the highest number of neutral (23), and positive (18). Respondent 8 had the highest amount of very positive feedback (6), others such as Respondent 2 and 3 had an equal mix of neutral and positive feedback. In terms of overall feedback, it was generally positive to neutral without many negative responses.

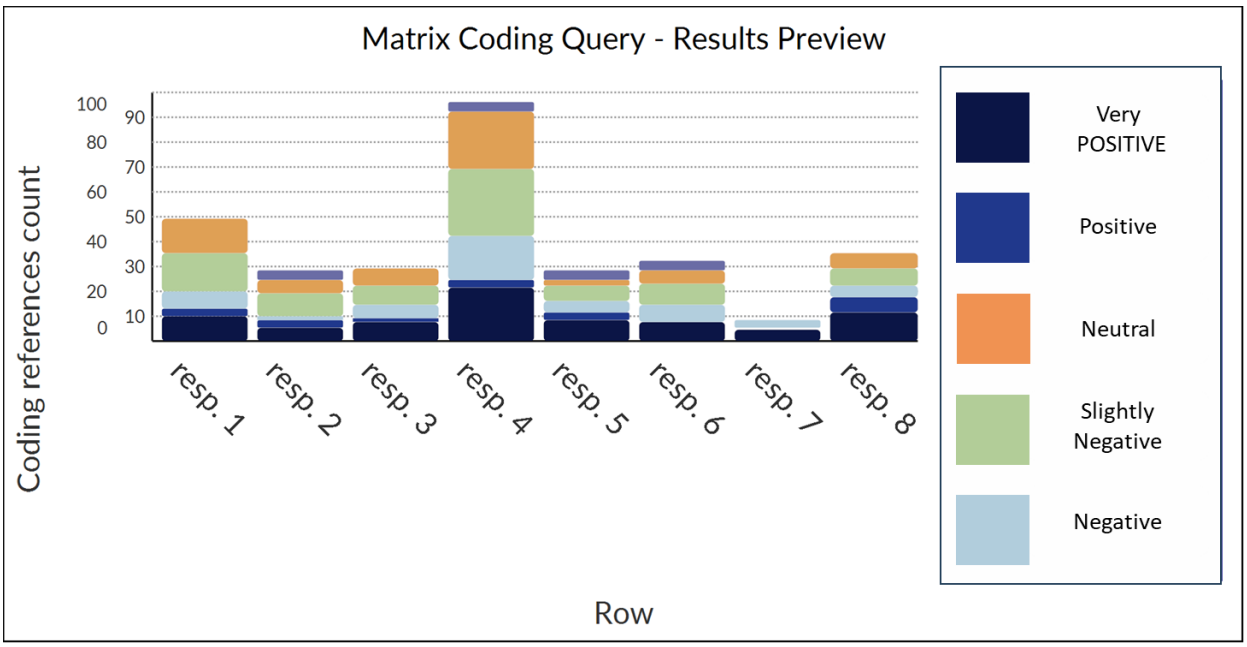



***Figure 22: Sentiment Analysis***

Feedback from industry experts corroborates these findings, emphasizing that the FIDIC 2017 edition provides more comprehensive and enforceable clauses. Sentiment analysis of their responses revealed a predominantly positive outlook, with "Moderately Positive" and "Very Positive" sentiments outweighing any negative feelings. For example, one respondent (Res. 4) highlighted the effectiveness of DAABs, as evidenced by the significant number of positive sentiment codes assigned to their interview.

## 4.13 Practical Challenges in Implementation

Claims-related clauses and dispute resolution mechanisms under FIDIC 2017: Practical issues arising from systemic and situational factors of the construction industry Compliance with stringent notice provisions remains a significant challenge because most contractors and employers have limited understanding of the procedural aspects of the law as well as the legal notice requirements and procedures. Res. 4 and Res. 6 also stressed that ignoring these requirements leads to losing valid claims and poor expertise and resource distribution among small contractors. Lack of resources and inadequate training also contribute to difficulties implementing FIDIC 2017 provisions in practice. As Res. 5 and Res. 8 pointed out, the industry needs qualified personnel with a good knowledge of Dispute Avoidance/Adjudication Boards (DAABs). This gap results in

decoupling the use of dispute resolution mechanisms and reduces the effectiveness of DAABs as intended. In addition, training is regarded as a waste of resources, and stakeholders do not encourage capacity development. The last factor that acts as a strong barrier is the problem of organizing DAABs regarding logistics and funding. Moving from DABs to DAABs under FIDIC 2017 involves significant upfront costs, a costly proposition for small firms. Cohosts like Res. 2 and Res. 3 stated that funding-related problems and disagreement on the board's composition often result in the slow formation of DAABs, thereby hampering their functionality.

This is compounded by resistance to adopting technology to support these processes. Though numerous studies have shown the effectiveness of digital tools in improving claims management and resolving disputes, many organizations still use paper-based tools that are ineffective and contain many mistakes. This resistance was attributed to awareness and organizational resistance to change by the specified experts, which included Res. 6 and Res. 7. Cultural and regional differences are also felt when applying FIDIC provisions. Despite the global framework of using the DAABs, informal negotiation is practiced in some jurisdictions, which is why they are underutilized. Finally, the structure of the interview can be discussed: two of the seven responses highlighted the problem of FIDIC’s standardized approach and the localization of practices as a repeated one (Res. 1 and Res. 7). Another challenge is time constraints since failure to appoint members of DAAB or to initiate the dispute resolution processes leads to the prolongation of conflict, increased costs, or reduced efficiency of the project. However, enforcement of the provisions of FIDIC 2017 in real-life situations often falls short, as is provided by Res. 4 above. To overcome these difficulties, it is crucial to invest in appropriate training, allocate adequate resources and integrate the use of technologies and region-specific approaches to make the most of FIDIC 2017 and to guarantee a successful adoption of its claims and dispute resolution.

### 4.14 Discussions

FIDIC dispute resolution mechanisms evolved into unstructured processes in 1987, increasingly sophisticated, proactive processes in 1999 and then more sophisticated in 2017. Introducing Dispute Adjudication Boards (DABs) was a significant advance in dispute handling efficiency in the 1999 edition, later further raising the standards by refining the concept in the Dispute Avoidance/Adjudication Boards (DAABs) of the 2017 edition. These boards emphasized dispute

prevention and resolution through collaboration in minimizing potential disputes (Res. 1, Res. 3, Res. 5, Res. 6). The 2017 FIDIC edition is more transparent and more enforceable than its predecessors. It incorporates proactive mechanisms for reducing prolonged disputes through active involvement and structured arrangements. This improvement reflects FIDIC's determination to make the dispute resolution framework more transparent and straightforward (Res. 1, Res. 2, Res. 3, Res. 6).

The positive feedback for the 2017 edition of DAABs, which allows dispute prevention and facilitates collaborative resolution, has been noted. Nevertheless, there are still challenges: the high costs involved in their implementation and the shortage of qualified experts (Res. 1, Res. 2, Res. 5, Res. 6). While the above progress is made, FIDIC 2017's strict procedural requirements are becoming a challenge for stakeholders. For example, the 28-day notice rule is often problematic because of poor documentation practices and fear of causing strain in professional relationships. Such procedural compliance issues highlight the importance of record keeping and balancing requirements with enforcement (Res. 1, Res. 4, Res. 5, Res. 6).

Another barrier to the recharging of DAABs is the costs and logistical demands of creating them. Smaller contractors and firms face the financial and resource burdens that make DAABs unfeasible in some cases (Res. 5, Res. 8, Res. 4). Furthermore, the potential of new technologies, such as AI, blockchain, and cloud platform for streamlining claims management and dispute resolution, is unexplored mainly in areas like Pakistan, where adoption is low (Res. 7, Res. 5, Res. 6, Res. 8).

Regional variations and administrative constraints further complicate this implementation. FIDIC is intended to be a global standard, and its provisions sometimes clash with local practice and legal systems; FIDC is therefore not always suitable for specific jurisdictions (Res. 4, Res. 5, Res. 8). These challenges need to be addressed through comprehensive training of contractors, employers, and engineers (Res. 2, Res. 5, Res. 6, and Res. 7) improve understanding and practical application of FIDIC provisions, improve stakeholder compliance, and benefit from the framework's dispute resolution mechanisms.

Future FIDIC updates should include more precise drafting and flexible requirements due to real-world lessons from ambiguous clauses, procedural lapses, and delayed notices. Furthermore,

region-specific guidelines would assist in closing the gap between FIDIC's global standards and local practices (Res. 2, Res. 3, Res. 5, Res. 6).

As a result, analysis of the FIDIC 1987, 1999, and 2017 editions revealed the refinement of claims and dispute resolution provisions as part of contractual best practice development. For its time, the FIDIC 1987 edition was pioneering but was highly criticized for procedural deficiencies and a lack of support for effective dispute management. This lack of clarity often resulted in an inconsistent approach to handling claims.

FIDIC 1999 edition, the Dispute Adjudication Board (DAB) is provided as a procedure for adjudication of disputes. The idea behind the DAB was to bring about speedy and cheaper resolution of disputes. Its effectiveness, however, was hampered by enforcement challenges a few times, and the issue of jurisdictional applicability adversely affected it. Since then, more progress regarding this aim was added to the FIDIC 2017 edition to improve procedural efficiency, including the Dispute Avoidance/Adjudication Board (DAAB), the earliest implementation of which aimed at anticipating common obstacles. The DAAB was a preventative to disagreements and a mechanism to clear the procedural rules early on. However, these developments indicate FIDIC’s resolve to update its contractual framework for a new economy and the appearance of current market and global barometers to make its contractual standard more effective.

A thematic analysis of the industry professional sentiments using the NVivo platform indicates that these findings are also supported by the benefits brought by the FIDIC 2017 edition compared to its predecessors. Neutral feedback was received for the FIDIC 1987 edition, which was thought primitive and poorly explained. Mixed reactions to the FIDIC 1999 edition were given as an introduction to the DAB into a structural form, which was welcomed, but the enforcement and jurisdictional problems were criticized.

On the other hand, the FIDIC 2017 edition was viewed as having been designed with a great deal of procedural rationality, a manifest focus on dispute prevention, and, as far as DAAB processes were concerned, the most legally sophisticated contracting system. Over and over, these features were seen to meet the requirements of a modern construction project and a legal framework.

Nevertheless, the application and execution of DAAB mechanisms within other jurisdictions still face some difficulties. Differences of legal and cultural nature may become the barriers to uniform enforcement. This analysis shows how the FIDIC framework developed from the content of a simple mechanism in 1987 to a composite and coherent structure in 2017. The advances are substantial, but more would still be needed in jurisdictional flexibility and DAAB operationalization to ensure the sustainability and efficiency of the FIDIC framework within the global construction sector.

## 4.15 Chapter Conclusion

This chapter gave a thorough analysis of the evolution of the claim and dispute resolution mechanisms in FIDIC 1987, 1999 and 2017. Key procedural changes, outlined how the engineer would be involved in claim determination, applied tighter time bars, and transitioned to an adjudication-based dispute resolution. The findings were modeled from thematic analysis of NVivo and pointed out trends with neutrality, time efficiency and procedural formalization. They also revealed how the practical challenges appear in the context of interviews with experts. The chapter then suggested a structured framework for improving the efficiency of claim management and streamline the disputes resolution in FIDIC based contracts.

# CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

## 5.1 Conclusion

The research seeks to develop systematically the claims and dispute resolution provisions of FIDIC contracts from 1987 to 2017. FIDIC 1987 then provided the basic structure for dispute resolution process which was an improvement but was deficient due to lack of clarity of procedures and the legal compulsiveness had come up which needed an evolutionary development to improve. This encouraged the use of Dispute Adjudication Board (DAB) in FIDIC 1999 and Dispute Avoidance and Adjudication Board (DAAB) in FIDIC 2017. DAAB is a real measure of progressive move since it ensures that disputes will be prevented and resolved, that it helps to provide greater procedural certainty and ensuring enforceability. We conducted a sentimental analysis of the views of the stakeholders which revealed that most of the stakeholders had a positive attitude toward FIDIC 2017 because it completed with the current construction trends and shifted from a dispute solving method. Yet, the study finds some logistical troubles, varying approaches to technology for use in claim and dispute resolution, wide acceptance, and regional obstacles. Such gaps require constant dynamism and improvement of FIDIC framework for implementation and efficiency.

Due to this study findings, FIDIC 2017 shows that it pays attention to some existing industry challenges such as using DAAB and enhanced contractual definition. There are, however, practical problems of implementation, implementation of sophisticated technologies, and the need for talk of education of stakeholders in order for it to fully realize its potential. To keep up the FIDIC framework's future effectiveness, improvements should be made to the mentioned domain as having key basis on the development of the framework.

## 5.2 Recommendations

This research therefore argues that the measures provided by FIDIC 2017 to control claims and disputes require more than an integrated and strategic approach. Firstly, in order to do real time tracking, proper documentation and smooth communication; it should be prioritized that first the use of up-to-date technologies such as cloud solutions and AI in analytics should be made. The

technologies embodied in these systems improve accuracy and speed to handle claims and disputes. It is equally important to train the stakeholders in the industry and on DAAB processes, and those related to the notice provisions clearly laid out in the FIDIC documents. This will cause them to make sure that the framework is applied evenly and in accordance with various projects given that for instance guidelines for FIDIC rules should be developed for each of the preamble regions to cater for the peculiarities of each jurisdiction as well as make FIDIC provisions more feasible to use into different legal frameworks of different countries. Secondly, resources to employ 'good' adjudicators should be dedicated, those adjudicators should be made available and the services used should be encouraged. The FIDIC framework is constantly changing to keep up with the new trends of the construction industry, hence the need to change it frequently to capture newer working technologies in the industry and other complicated aspects in the industry. Finally, proactive claims management should be promoted in the form of increased cooperation with possible opponents to prevent future issues becoming real claims. The approach taken is fully in line with the preventive spirit stated in FIDIC 2017 and reinforces the culture of early dispute management. Future studies should continue to assess DAABs and integration technological effects and provide objective information for updating FIDIC guidelines to assist the construction global sector in using DAABs practically.

### 5.3 LIMITATIONS

Using a qualitative research model, interviews and a thorough literature review of the development of claims and dispute resolution procedure under FIDIC frameworks is adopted. However, given these possibilities, the study has good potential for further enriching the subject’s depth and accuracy, by providing for the examination of the theoretical concepts more detailed and closer. Moreover, in the subsequent research, the quantitative approach will provide additional and deeper contextual understanding of the study as well as statistical support to the research. But in addition, it will be useful to study further the effects of Dispute Avoidance and Adjudication Boards (DAABs) and emergency technologies on resolution of dispute results. This would result in them producing useful knowledge to examine and enhance FIDIC manuals to handle the new and changing challenges of the construction field.

### 5.4 Future Directions and Innovations

Further developments and innovations in relation to claims and dispute resolution of FIDIC contracts were discussed in the expert interviews. The four areas of emphasis include technology solutions and processes, processes and procedures, regions and sustainability. The first principal advice is to use advanced technology to increase efficiency of handling disputes. Digital tools such as clouds, AI and the blockchain were stressed as an opportunity by Res 6 and Res 8 experts. First, there is the use of AI to predict conflict areas and intervene in time, second, use of blockchain to enhance the trust between parties by creating the trusting ledger of claims and dispute history. Further, these technologies are key in diminishing administrative obstacles and ensuring better compliance with notice principles that are a major problem in current practice. Another important issue found was regional flexibility expressed based on FIDIC provisions, since Res. 3 and Res. 5 indicate to make more flexible the provision of FIDIC contracts to cope with jurisdictional and/or cultural differences. It also involves adjusting the mechanisms of disputes resolution to the legal systems, arbitration practices and standards of local countries and FIDIC contracts become globally acceptable. The customizable clauses would retain applicability in legal and operational spheres. The FIDIC 2017 changes were recognized to be a positive development in relation specifically to Dispute Avoidance/Adjudication Boards (DAABs). But Res. 2 and Res. 4 were adopted by the opinion to improve these mechanisms and direct them to the preventive way and the line of return from the reactive adjudication to the constructive approach. Preventative measures include mandating that the DAABs conduct periodic audits to prevent any disputes from arising in the first place and establishing risk assessment tools. Such measures would rely on the work of joint actions of all parties involved in such cases to create a culture of absence of disputes and increase productivity in the projects.

It is also crucial to close the skill gaps in the application of the FIDIC provisions. This prompted Res. 1 and Res. 7, which urged the need to develop a systematic training session in workshops, certifications and online courses to improve the knowledge of DAAB procedures under the 2017 provisions to the stakeholders. Also, we proposed that it would be useful for abundant knowledge improvement in the creation of forums where experts of the industry can meet and share their practical experiences of using FIDIC standards and cases of FIDIC standards implementation. Sustainable and ethical aspects were documented as characteristics that should comprise the future

revisions of the FIDIC contracts. As to the latter, one recommended should contain clauses such as environmentally friendly ones as well as OK dishonesty, including telling claims, presumably. It makes sense in line with how such a trend is gaining hold in the construction industry. Moreover, the extent of incorporation of technology can be extended in relation to the new development. Visual examples could assist adjudicators in gaining a better understanding of project conditions, by both VR and AR. Furthermore, based on data that went into the analysis of claims and conflicts, more fine information can be given to future updates of FIDIC. Finally, managing stakeholder relations to keep the stakeholder relations at antagonistic levels as small as possible and high as possible. Res also recommended on the basis that. 2 the contractual modifications also be made to incorporate joint problem-solving workshops conducted by DAABs or independent mediators. Improvement of decision making as part of a cooperative context and solutions of conflicts are also possible with these initiatives. Hence, FIDIC can ensure that its framework meets changing challenges and become the basis of construction industry agreement dispute resolution.

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