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Construction Claims Management Practices and Dispute Resolution Mechanisms in Construction Contracts

Master Thesis

Construction and Real Estate Management

Faculty of Engineering

from

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Date:

Berlin, 05.07.2024

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Acknowledgement

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I would like to express my deepest gratitude to everyone who has supported me throughout the journey of completing this thesis.

Firstly, I would like to dedicate this work to my family, who have always been there for me throughout the years. Thank you for your love, care, and continuous support. Your belief in me has been a source of strength and motivation, helping me to persevere through all the challenges.

To my friends, thank you for your encouragement and motivation. Your company and support are what keep me going and always motivated.

I also would like to thank my supervisors Prof. Liias and Ing. Sistani, whose feedback and guidance were invaluable. Your insights and constructive feedback have greatly contributed to the quality and direction of this thesis.

I am particularly grateful to the respondents of the questionnaire, whose participation provided the essential data and insights necessary for this study. Your willingness to share your experiences and expertise has been crucial to the success of this research.

Lastly, I wish to acknowledge anyone who has helped me reach this position, whether through direct assistance, mentorship, or support along the way. Your contributions have been deeply appreciated and have played a significant role in my journey.

Thank you all for being a part of this achievement.

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Hochschule für Technik und Wirtschaft Berlin
University of Applied Sciences

International Master of Science in Construction and Real Estate Management

Joint Study Programme of Metropolia Helsinki and HTW Berlin

Date: 02.03.2024

Conceptual Formulation

Master Thesis for Mr. Fady Fakhereldin

Student number: 585964

Construction Claims Management Practices and Dispute Resolution Mechanisms in Construction Contracts

Introduction:

Construction projects are complicated, and their management is usually problematic due to the large number of variables they have, including but not limited to the different stakeholders, processes, labour, equipment, material, and project's staff. These numbers of variables and their interconnection often lead to delays, disruptions, and conflicts to the construction process and affects all aspects of the project, such as time, cost, quality and scope which automatically transcribes into unanticipated significant financial impacts. These conflicts basically occur as a result of disagreements between the various parties involved and lead to construction claims.

"A Construction Claim is a request by either party to the contract, usually the contractor, for compensation for damages caused by the failure of the other party to fulfil his part of obligations as specified in the contract. The compensation is usually an additional payment or an extension of time (EOT) or both" (Shah, 2014). Construction claims arise from several factors including but not limited to changes in scope, changes in plans or specifications, design and coordination errors, idle machines, idle labour, poor quality of materials and works, delay in supply of materials, delay in payments, delay in commencement, natural disasters, or unforeseen and physical conditions. The resolution of the construction claims is often complicated and consumes a lot of time, effort, and money, which may result in cost overruns, delays to the project's program and even legal disputes in some cases. These legal disputes are usually critical and costly on each single aspect, not only from the project's point of view but on the whole construction business.

While there are many dispute resolution options available, the most common are litigation, mediation, and arbitration. The study will review each of these mechanisms and discuss the advantages and disadvantages of each method of dispute resolution. Whereas it is worth mentioning that the process for managing a construction claim and the selected dispute resolution mechanism for a given project is not decided after the dispute arises, but during the drafting of the construction contract. Hence, a well-drafted contract will encompass clauses and provisions that set forth the process for the parties to the contract to follow in the event of a claim/dispute. "All standard form construction contracts have dispute resolution provisions. Some prescribe the procedures, and some allow for election of options, with a default to one particular method if no election is made. You should always review and, if necessary, negotiate the dispute resolution provisions in all contracts you consider signing." (NASBP, 2017)

An effective claim management system should be proactive rather than reactive. It should identify potential claims early on and take steps to prevent them from happening. When a claim does occur, the system should provide a clear process for documentation, review, negotiation, and dispute resolution. Moreover, the identification and selection of the appropriate dispute resolution mechanism for the project remains a continuous issue, especially that there is no correct way of selecting a dispute resolution mechanism and resolving construction disputes. This topic has always been one of the most critical issues in the construction industry. Therefor, this research will aim to study the different claim management practices and dispute resolution mechanisms, determine the most suitable methodologies based on each case/project, discuss the ways of resolution, and will try to propose a recommendation for the used practices and mechanism in each project based on its type, location, size, and complexity.

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Research Methodology:

The research will study the different claim management practices and the dispute resolution mechanisms along with their implementation in construction contracts through mixed-methods studies combining both qualitative and quantitative approaches, for example:

- Contextual methods: Studying and describing the current conditions in the industry and defining how the claim management process is administered and how this affects the project.
- Comparative methods: Comparing different cases through real-life projects with all the changed variables to determine the suitability of each mechanism.
- Evaluative methods: Reviewing previous projects and their contract clauses to examine their effectiveness in assessing delays and resolving conflicts.
- Generative methods: Providing new ideas for the development of contract clauses and frameworks for the dispute resolution process.
- Interviews: Interviewing project managers to discuss the obstacles encountered in the claim management process and document the lessons learned and suggested resolutions.
- Questionnaires and Surveys: Collecting data from the industry's expertise to enhance current processes.

These methods will be mainly dependent on my previous experiences and the projects' contracts that I have administered through my work experience as a contract administrator. Considering that the Projects' documents and details should remain confidential and are only used for educational and research purposes without any prejudice to any Disclosure/Confidentiality clause in the Contracts.

Research Objectives:

1. To evaluate the current practices of claim management used in construction contracts, and identify the challenges and limitations faced by contractors in implementing these processes.
2. To examine the impact of the claim management process on project outcomes, such as cost, time, and quality, and to determine whether the use of the procedures lead to more successful project outcomes.
3. To identify the key factors that affect the dispute resolution mechanism in construction contracts, such as contractual provisions, project complexity, project size, and the expertise of the parties involved.
4. To examine the legal implications of using different dispute resolution mechanisms in construction contracts and analyze the potential risks and implications arising from the use of inaccurate or inappropriate techniques.
5. To propose recommendations for selecting the most appropriate practices and mechanisms for claim management and dispute resolution to different types of construction contracts based on project characteristics, and available data and strategies for overcoming implementation challenges.

Timeline:

Milestone	Start Date	End Date
Planning Thesis Outline	1/7/2023	31/7/2023
Data Collection	1/8/2023	31/10/2023
Literature Review	1/11/2023	31/12/2023
First Draft	1/1/2024	31/1/2024
Interviews and Surveys	1/2/2024	31/3/2024
Second Draft	1/4/2024	30/4/2024
Final Draft	1/5/2024	30/6/2024
Master Thesis Submission	**July 2024**	

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Signature of the 1st Supervisor

Signature of the 2nd Supervisor

Abstract

The Construction industry is one of the most complicated industries worldwide, due to the large number of variables that affects it, including but not limited to the different stakeholders, processes, labour, equipment, material, and project's staff. These variables and their interconnection often lead to delays, disruptions, and conflicts to the construction process and affects all aspects of the project, such as time, cost, quality and scope which automatically transcribes construction claims are unavoidable in the industry. This thesis examines the different claims management processes and procedures in the construction industry and compares them to the Egyptian market, identifying critical issues and proposing recommendations for improvement based on international best practices. The author conducted a questionnaire among construction and claims experts from the Egyptian market to identify the critical issues. The research highlights several key challenges, including poor communication between site and claims teams, inadequate documentation practices, reluctance to document verbal instructions, fear of damaging relationships through claims notifications, and the lack of specialized software for managing claims, as a result the research emphasizes the importance of robust communication, digital documentation systems, standardized documentation practices, and the adoption of advanced project management tools. In addition, the study proves the need for enhanced training programs, clearer contractual provisions, and increased awareness of alternative dispute resolution methods. By addressing these issues, the Egyptian construction industry can significantly improve its claims management processes, leading to fewer disputes, lower project costs, and better project outcomes. The findings present a comprehensive overview of the current state of claims processes in Egypt and offer actionable recommendations to align local practices with international standards.

Keywords: Construction, Construction Claims, Claims Management, Project Management, Egypt, Dispute Resolution Mechanisms.

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List of Abbreviations

AAA	American Arbitration Association
AACE	American Association of Cost Engineers International
ADR	Alternative Dispute Resolution
CRCICA	Cairo Regional Centre for International Commercial Arbitration
CVI	Confirmation of Verbal Instruction
DAB	Dispute Adjudication Board
DAAB	Dispute Avoidance and Adjudication Board
DRB	Dispute Review Board
DRBF	Dispute Resolution Board Foundation
EAL	Egyptian Arbitration Law
ECAS	Egyptian Centre for Arbitration and Settlement
EOT	Extension of Time
FIDIC	International Federation of Consulting Engineers
Fig.	Figure
ICC	International Chamber of Commerce
LDs	Liquidated Damages
SCL	Society of Construction Law

1. Introduction

The construction industry is characterized by its complexity and dynamic nature, involving numerous stakeholders, significant investments, and extended timelines. As such, it is inherently prone to disputes and claims, which can significantly impact project performance and outcomes. Claims management is a critical aspect of construction project management, encompassing the identification, evaluation, and resolution of claims arising from various project-related issues. Effective claims management processes are essential to minimize disputes, ensure timely project delivery, and maintain positive stakeholder relationships. (Ofori, 2015) Construction claims can arise from various sources, including design changes, delays, unforeseen site conditions, and contract ambiguities. These claims, if not handled in an effective and efficient way, may result in protracted disputes, cost overruns, and project delays. The claims management process involves systematic procedures for documenting, analysing, and negotiating claims to achieve fair and timely resolutions. Various dispute resolution mechanisms, such as negotiation, litigation, arbitration, and mediation, are employed globally to address construction claims, each with its own advantages and limitations. (Mohamed et al., 2014)

Globally, the construction industry has developed advanced methodologies and frameworks to manage claims effectively. However, the effectiveness of these processes can vary significantly across different regions due to local legal frameworks, industry practices, and cultural factors. The Egyptian construction market contributes pivotally in the national economy, yet it faces numerous challenges related to claims management. Despite the critical importance of this subject, there is a gap of comprehensive studies examining the specific issues affecting claims management processes in the Egyptian construction sector. (Hassanein & El Nemr, 2008)

The Egyptian construction industry, while vibrant and essential to national development, encounters significant challenges in managing construction claims effectively. The lack of a standardized approach to claims management, coupled with limited awareness and expertise among local practitioners, intensifies the problem. This often results in prolonged disputes, increased project costs, and strained relationships between stakeholders. Therefore, there is a pressing need to

investigate the current claims management practices in Egypt, identify the key issues, and propose improvements based on international best practices. (Elbehairy & Nagy, 2023)

This study tends explore the claims management processes in the international market to understand the practices used worldwide for claims process in the construction industry, and identify the challenges and limitations faced by contractors in implementing these processes. The significance of the research is based on addressing a critical gap in the current understanding of claims management in the Egyptian construction industry; by identifying the key issues and comparing local practices with international standards, the research aims to provide actionable recommendations to enhance the claims management processes in Egypt and ensure they are effective and efficient. These recommendations can lead to reduced disputes, lower project costs, and improved project outcomes, thereby benefiting all stakeholders in the Egyptian construction sector.

1.1 Research Objectives

Construction Claims is a controversial topic in the Construction industry and the paper aims to study the different claim management processes and the dispute resolution mechanisms and their implementation in Construction projects. Hence, this paper intends to achieve the following objectives:

- To evaluate the current practices of claim management used in construction projects worldwide, and identify the challenges and limitations faced by contractors in implementing these processes.
- To identify and examine the different issues that impact the claim management process in the Egyptian construction industry and to determine the required actions that would lead to more successful project outcomes.
- To identify the key factors that affect the dispute resolution mechanism in construction contracts, such as contractual provisions, project complexity, project size, and the expertise of the parties involved in the Egyptian industry.
- To analyse the potential risks and implications arising from the use of inappropriate techniques in the claim management practices and compare the issues in the Egyptian construction industry with worldwide procedures.

- To propose recommendations and improvements for the claim management processes and dispute resolution mechanisms to avoid the existing issues in the Egyptian construction industry and improve the claim management practices in the market to align with the international practices.

1.2 Research Scope

The scope of the thesis would encompass the current practices of claim management and investigate the methods and techniques employed by contractors in managing claims in construction projects around the world. In addition, it includes identifying the key factors affecting the claim management process and the dispute resolution mechanisms, their techniques, and their effectiveness in the construction process. This would include analysing identification, documentation processes, negotiation strategies, administrative procedures, exploring the challenges faced by contractors in implementing claim management processes in the Egyptian industry, and assessing the effectiveness of claim management processes that influence project outcomes, including cost, time, and quality. Finally, Investigating the implications associated with different dispute resolution mechanisms, such as arbitration, mediation, or litigation, and analysing the potential risks and consequences arising from the use of inappropriate or inaccurate techniques in resolving construction disputes. All the analyses and studies will be based on the available research, studies, articles, previous dissertations, case studies, industry standards, and the author's work experience. The findings will be reverified through questionnaires with experts from the Egyptian industry and the construction claims field.

1.3 Research Methodology

The research will study the different claim management processes, practices and the dispute resolution mechanisms along with their implementation in construction projects generally in international projects and specifically in the Egyptian industry through mixed-methods studies combining both qualitative and quantitative approaches, for example:

- **Contextual methods:** Studying and describing the current conditions in the industry and defining how the claim management process is administered and how this affects the project.
- **Comparative methods:** Comparing different cases through real-life projects with all the changed variables to determine the suitability of each mechanism.
- **Evaluative methods:** Reviewing available studies and the current claims management processes to examine their effectiveness in assessing delays and resolving conflicts.
- **Generative methods:** Providing new ideas for the development of clauses and processes for the claim management and dispute resolution process.
- **Questionnaires:** Collecting data from the construction claim's expertise to identify issues in the current processes in the Egyptian industry and find means to enhance them.

These methods will be mainly dependent on the author's previous experiences and the available projects' data, whereas the research methodology is illustrated in Fig.1 below:

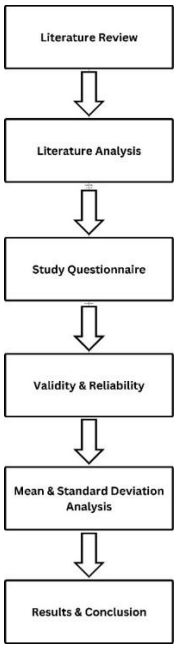

Figure 1: Study Methodology

2. Construction Claims

2.1 Claim Definition

In construction contracts, a ‘Claim’ usually refers to a formal demand or request by one party to other (usually the contractor, the subcontractor or the owner) in which the claimant seeks to adjust existing terms or seek additional compensation based on occurrences or circumstances that have already changed. The nature of such compensation may be on the assumption of time or cost implications or both. (Shah, 2014). Reasons for Claims may take various forms where it may include but not limited to change in scope of work, design errors, delay in supply of material, change in design, labour strikes, unforeseen site or weather conditions, natural disaster or any other occurrence or circumstance that may affect the progress or cost or both of the works.

The preceding events are primarily related to added cost, losses, delays, disruptions or other damages suffered by the project as their result. Every claim must be substantiated by documentation, particulars, and evidence, which includes the documented log of all the transactions, records of inspections and measurements, and the like; and by contract clauses, in order to enable the defendant to make a fair assessment. Procedures for claims submission and assessment should be defined in the project's contract in order to assist the parties in evaluating the damages incurred and at the same time helping them to avoid disputes that would, in turn, delay the project progress, increase costs and even lead to legal proceedings.

Having sufficient skill in managing claims related to construction projects and timely and fairly dealing with them will ensure the project's continuity and success. In the following paragraphs, we will discuss some of the reasons behind claims in the market, their types and implications, in addition to the claims management practices that we usually use in construction contracts and projects in order to prevent any potential disputes.

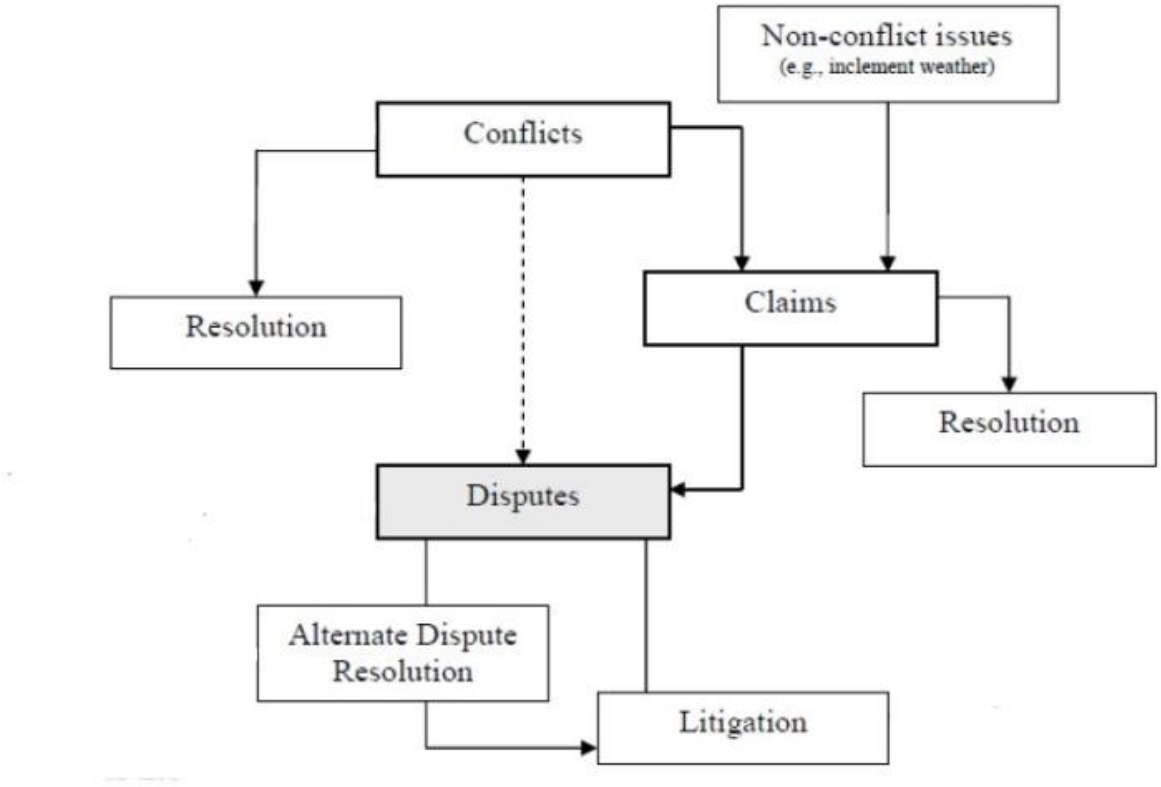

Figure 2 : Conflicts in Construction Industry (Gebken, 2006)

2.2 Types of Construction Claims

Disputes frequently arise between parties involved in a building project, and construction claims are instances where one or more parties seek extensions of time or financial compensation for damages as per the provisions of a legally binding contract. Such claims can be categorized in various ways depending on different criteria. The diagram below outlines and classifies the main types of construction claims, providing a framework for their identification and review. (Adroit, 2017)

According to AACE International® (2004), a claim is defined as: "The demand or assertion of a right by one party against another party for a recoverable monetary sum to compensate for damages sustained under the terms of a legally binding contract." A claim is initiated when one or more parties enforce their contractual rights. A claim is submitted by one party and received by another, which must then respond by either granting an extension of time (EOT) or compensating for the damages incurred, or by rejecting the claim's validity. Construction claims can be classified in various ways. One expert might classify them based on responsibilities,

while another might focus on their causes. The tree-like structure illustrated below shows an example of how to categorize the primary types of construction claims (Gould, 2008).

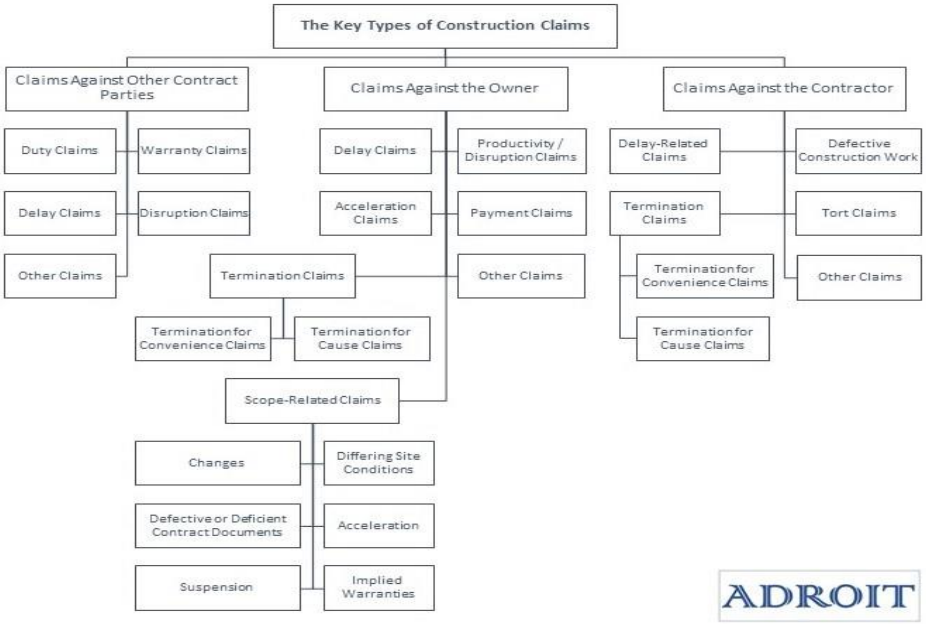

Figure 3: The Key Types of Construction Claims (Adroit, 2017)

“Construction claims can be categorized into three basic categories as claim against the contractor, claims against the owner, and claims against other contract parties. Claims against the contractor have five main classifications, including delay claims, defective construction work, tort claims, termination claims, and other claims” (Adroit, 2017); Figure 3 illustrates. Among all, delay claims are most commonly filed by owners against the contractor. The owner would file the delay-related claim when they find that the contractor has “in some way failed to satisfy certain criteria defined by the contract.” In relation to the construction claims against the owner, the contractor files most claims against the owner. This situation may arise because the contractor will realize that some “basic inputs” that he made during the bidding process were not true. These inputs may be that the scope, specification, site conditions and requirements, for example projected delivery periods of materials “owner furnishes” during the construction project are inaccurate. “Contractors’ delay claims are classified into the five categories, including delay claims against an owner, productivity/disruption claims, acceleration claims, payment claims, scope-related claims, termination claims, and other miscellaneous claims against an owner” which all have the same pattern. (Adroit, 2017)

The other main category of construction claims is the claim against other contracting parties. The figure 3 shows “there are five categories of the claims against other contract parties, including duty claims, warranty claims, delay claims, disruption claims, and other claims.” (Adroit, 2017) The reason for making these claims may be that these occur because the construction company makes some claims against the design company that designs and reviews the design of the construction project, construction management firm that manage the construction project during the construction process, or other key contract parties to the contract dispute.

The internal provisions of the contracts of construction are the basis of the contractual relationship – so they have to be used to establish and interpret rights. The issue of who is entitled to what emerges within the contractual relationship and is considered to be multi-layered and complicated. This means that, when determining construction contract rights, it’s not enough to work solely with the contracts themselves, the form and documentation. You must be prepared to look at what else existed at the time: the contemporaneous evidence, the records. To ensure that rights are allocated equitably and fairly, particularly in construction projects, wherever possible you need to locate and identify them accurately, both precisely and comprehensively.

2.2.1 Delay Claims

Construction delay claims are a prevalent form of dispute in construction. Delay claims involve unexpected events/circumstances that unexpectedly extend the time to complete the project or impede work from being accomplished within the timeframe provided. Construction projects frequently experience programme delays due to various factors. Mega and complex projects with several interfaces are prone to delays and interruptions. They can often be very difficult and time-consuming to pin down, since any given project could have several parties at any given time. Many researchers wrote papers on why delay occurs in building construction and classified them afterwards. In 2014, Marzouk and Rasas classified the delays according to the following figure:

Delay group	Causes
1. Owner related	1.1 Slow decision making 1.2 Suspension of work 1.3 Late in revising and approving design documents by owner 1.4 Delay to furnish and deliver the site to the contractor 1.5 Delay in finance and payments of completed work by owner 1.6 Variation orders/changes of scope by owner during construction 1.7 Type of project bidding and award (negotiation, lowest bidder) 1.8 Unrealistic contract duration 1.9 Ineffective delay penalties 1.10 Owner interference
2. Consultant related	2.1 Inadequate experience of consultant 2.2 Delay in approving shop drawings and sample materials 2.3 Mistakes and discrepancies in design documents 2.4 Unclear and inadequate details in drawings 2.5 Quality assurance/control
3. Contractor related	3.1 Difficulties in financing project by contractor 3.2 Poor site management and supervision 3.3 Ineffective planning and scheduling of project 3.4 Rework due to errors during construction 3.5 Delays in sub-contractors work 3.6 Inadequate contractor experience 3.7 Delay in site mobilization 3.8 Delay in preparation of shop drawings and material samples
4. Material related	4.1 Shortage of construction materials in market 4.2 Delay in material delivery 4.3 Changes in material types and specifications during construction
5. Labor & equipment related	5.1 Shortage of labors 5.2 Unqualified workforce 5.3 Low productivity level of labors 5.4 Equipment availability and failure
6. Project related	6.1 Effects of subsurface conditions (e.g., soil, high water table, etc.) 6.2 Traffic control and restriction at job site 6.3 Unavailability of utilities in site or Delay in providing services from utilities such as (water, etc.) 6.4 Accident during construction 6.5 Problem with neighbors
7. External related	7.1 Weather effect (hot, rain, etc.) 7.2 Environmental restrictions 7.3 Changes in government regulations and laws 7.4 Slow permit by government/municipality 7.5 Delay in performing final inspection and certification by a third party 7.6 Lack of communication between the parties 7.7 Fluctuations in cost/ currency 7.8 Force Majeure as war, revolution, riot, strike, and earthquake, etc.

Figure 4: Delay causes of construction projects (Marzouk & Rasas, 2014)

Yet for any actual construction project there will be many factors that influence the probability of the previously mentioned events occurring, including the size, scale and complexity of the project, its location and jurisdiction, the laws that apply to work on that site. On the other hand, a project in an emerging country is more prone to happening late due to payment delays or inflation rates. A project in an equatorial as a result to mid-latitude climate is likely to have more delays from extreme weather, and so on. Due to the delays in project construction phases, these delays open the door for consequential issues. Thus, we observe that the time overruns in schedule result into a domino effect on every other aspect of the project. For example, time delays would result in an increase in final project costs and, consequently, budget overruns and lower profits. Moreover, this would increase waste of resources and people, and thereby impair performance of the whole project. Besides wastage of

material increases, final quality of the works deteriorate and inevitably the performed items have to be reworked again. All these consequences would give rise to claims and, in worst situations, to disputes either through arbitration, litigation, or other proceedings, which is not in any way good for the project. (Ramli & et al.,2018)

Extension of Time (EOT) Claims:

In construction, an EOT claim refers to an Extension of Time claim. It is a written demand by a contractor or subcontractor to extend the completion date agreed for a construction work in the event any of the above circumstances happen or because of other factors beyond its control. If the contractor faces a slippage in his project schedule during project execution then filing an EOT claim is the right way to communicate with the client or the project owner about the need for an extension to the schedule. This claim is typically supplemented with documentation or evidence supporting the reasons for the delay – for example, daily construction logs, correspondence with vendors or subcontractors, weather reports or any other type of recordkeeping. (Khosroshahian, 2022)

Once the project owner gets an EOT claim, they will then look at whether the underlying evidence warrants compensation. If that is proved, the milestones and the project completion dates will be adjusted accordingly. Nevertheless, the EOT claim is formally different in that it cannot guarantee an extension of time except where there are circumstances that fall within the various clauses in the contract for construction. There are several different approaches for filing and/or evaluating an EOT claim, and those approaches are known as delay analysis techniques. (Tan, 2021)

Delay analysis is an evaluation technique used to manage time-related disputes in the construction industry. These methods play an important role in the resolution of disputes related to EOT claims and other forms of delay. There are several techniques for delay analysis, each of which will involve a different approach to it, depending on the particulars of the project. Certain techniques are predicated on a retrospective analysis involving the evaluation of delays only after their conclusion into the project's evolution and events that led to the delays. This technique is based on the analysis of the project schedule and events in retrospect or after the event has taken place. It generally entails comparing the baseline with the actual dates and the condition of the project delivery. The essential steps are determining the reasons for the delay and calculating the extensions to the schedule. (Braimah, 2013)

Other methods are based on a predictive sort of analysis, such as forecasting delays before they happen and assessing the requirements created by anticipated events. The process is based on risk and event analysis of the project schedule, and trying to identify inherent delays and their impact in the future. It includes estimating the critical path of the project, identifying risk factors affecting the path, and creating mitigation strategies to avoid or reduce delays. Some of the main delay analysis techniques include:

1- Impacted As-Planned Method (IAP).
2- Time Impact Analysis (TIA).
3- Window Analysis.
4- Collapsed As-Built Analysis.
5- As-Planned Vs. As-Built Analysis.

Method of Analysis	Analysis Type	Critical Path Determined	Delay Impact Determined	Requires
Impacted As-Planned Analysis	Cause & Effect	Prospectively	Prospectively	• Logic linked baseline programme. • A selection of delay events to be modelled.
Time Impact Analysis	Cause & Effect	Contemporaneously	Prospectively	• Logic linked baseline programme. • Update programmes or progress information with which to update the baseline programme. • A selection of delay events to be modelled.
Time Slice Windows Analysis	Effect & Cause	Contemporaneously	Retrospectively	• Logic linked baseline programme. • Update programmes or progress information with which to update the baseline programme.
As-Planned versus As-Built Windows Analysis	Effect & Cause	Contemporaneously	Retrospectively	• Baseline programme. • As-built data.
Retrospective Longest Path Analysis	Effect & Cause	Retrospectively	Retrospectively	• Baseline programme. • As-built programme.
Collapsed As-Built Analysis	Cause & Effect	Retrospectively	Retrospectively	• Logic linked as-built programme. • A selection of delay events to be modelled.

Figure 5: Delay Analysis Methods (SCL, 2017)

Choosing the appropriate delay analysis technique for a construction project involves considering various factors, for example, the project's complexity, size, duration, status, and progress, the available data, the specific circumstances surrounding the delays, resources, the stakeholders' preferences, the industry standards, and finally the contractual requirements as the contract may specify certain methodologies or requirements for analysing delays and submitting EOT claims. Each method of the mentioned delayed analysis techniques has its own methodology for evaluating the Extension of Time, however, we can use a general formula that could be applicable to most of the Retrospective cases:

(Original Contract Period – Actual Contract Period) – Non-Excusable Delays = EOT

In this formula, the Original Contract Period is the duration originally agreed upon between parties of the project and stipulated under the project's contract, this duration is typically taken from the Project's Baseline. The Actual Contract Period is the actual time period utilized by the contractor to execute the project including all the delays, and this duration should be calculated from the Project's As-Built Schedule, incorporating the project's schedule updates and progress. Non-excusable delays refer to delays that are directly related to the contractor or the subcontractor and could have been avoided.

Prolongation Costs:

Prolongation costs are usually deemed to be the financial aspect of an EOT claim, it is also known as the extended overhead costs or extended general conditions, referring to the additional expenses incurred by a contractor, and which are directly related to the delays in the construction project beyond the originally planned duration. These costs arise when a project takes longer to complete than initially scheduled and the project is granted an Extension of Time, leading to prolonged overhead expenses, extended labour costs, and increased project management expenses. But to understand the entitlement for the prolongation costs, we first need to know the different types of delays in the construction industry. (Enderbury, 2023)

Excusable vs Non-Excusable Delays:

Excusable Delays: These delays are caused by factors beyond the control of the contractor, such as adverse weather conditions (e.g., rain, snow, hurricanes), acts of God, unforeseen site conditions, changes in regulations, or delays in obtaining permits or approvals.

Non-Excusable Delays: Non-excusable delays are within the control of the contractor or subcontractor and may result from factors such as poor project management, inadequate planning, insufficient resources, labor shortages, equipment breakdowns, or errors in construction.

Compensable vs Non-Compensable Delays:

Compensable Delays: Compensable delays are those for which the contractor has the entitlement to receive compensation for the additional costs or damages suffered pertaining to the delay. These delays are typically Owner's Risks events, such as owner-directed changes, design errors or omissions, unforeseen site conditions, late delivery of materials from the owner's side, or delays in obtaining permits or approvals.

Non-Compensable Delays: Delays for which the contractor is not entitled to receive compensation under the terms of the contract. These delays are typically neutral events caused by factors outside the control of either parties. Examples of non-compensable delays include adverse weather conditions or force majeure events like acts of God, natural disasters, or government actions.

Concurrent Delays:

Concurrent delays can be understood as multiple delay events - one caused by the employer and the other by the contractor - occur simultaneously, resulting in overlapping impacts experienced together. However, true concurrent delay instances can rarely occur.

In some cases, concurrent delay refers to situations when two or more delay events happen at various times but culminate in simultaneous impacts. In all cases, concurrent delay only becomes a concern if each delay event - whether initiated by the owner or the contractor - directly contributes to the overall delay in project completion. Thus, for concurrent delay to be established, each event must independently lead to a delay in project completion, rather than being incidental to it. Hence, there could be different scenarios to concurrent delays and each scenario has its own assessment whether the delay would be compensable or not, depending on several factors such as the contract, the leading event, the driving event, and the difference circumstances. Whereas concurrent delays are always an issue of dispute in the construction industry and there is not any approved methodology of resolving it in a systematic or analytical approach, the American Association of Cost Engineering (AACE) has provided a recommended practice for the different permutations of the concurrent delays in the following table:

Delay Event	Concurrent With	Result
Owner Delay	Contractor Delay	Excusable but Not Compensable to Either Party
Owner Delay	*Force Majeure* Delay	Excusable but Not Compensable to Either Party
Contractor Delay	*Force Majeure* Delay	Excusable but Not Compensable to Either Party
Owner Delay	Another Owner Delay	Compensable to Contractor
Contractor Delay	Another Contractor Delay	Compensable to Owner

Figure 6: Concurrent Delays Scenarios and Results (AACE, 2011)

Specific types of Prolongation Costs:

Once the contractor proves that the owner's delays have affected the program of works and directly extended the project's completion date, the contractor could claim for the extra prolongation costs that were incurred due to such extension, given that these delays were excusable, compensable delays. "Compensation for prolongation should not be paid for anything other than work actually done, time actually taken up or loss and/or expense actually suffered. In other words, the compensation for prolongation caused other than by variation is based on the actual additional cost incurred by the Contractor." (SCL Protocol, 2017)

Prolongation Costs are divided into two categories:

Onsite Overheads:

i) Extended Labor Costs: Delays to a construction project may require the contractor to retain labour resources for a longer period than originally planned. This can lead to additional labour costs, such as wages, benefits and other labour-related overhead, for the duration of the delay. Yet, the contractor is required to mitigate the extra costs and allocate the labour to alternative works (if possible) – if it is not proved so, the contractor's entitlement to the extra costs is at risk.

ii) Extended Equipment Costs: Contractors face extra costs due to the excessive use and wear out of the equipment and machinery on the construction site. Renting the equipment for longer than originally planned

involves extended period costs such as equipment rental fees, maintenance costs and depreciation costs.

iii) Additional Site Management Costs: Prolonged project schedules typically incur additional overhead costs for the contractor, for example, expenditure on project management, personnel fees, rent for facilities, public utilities, administrative personnel fees, insurance premiums, packages for communication, travel, clients, epidemics, and other organizational costs. These costs accumulate during the lifetime of the project and add unnecessary costs to the contractor.

Head Office Overheads:

Head office overheads are defined as indirect cost, which is incurred by a project contractor's main office or headquarters for supporting construction projects in which the contractor's company is executing, hence 'general overheads' or 'corporate overheads'. Overhead costs are those not directly allocated to a specific project, but rather necessary for the general operation and general management of the firm. Within the realm of prolongation cost claims, head office overheads can be involved in regards to the extra costs incurred by the contractor because of delays. Shifting the completion of the project two months into the following year might lead the contractor to demand payment of a pro-rata portion of head office overheads, in construction contacts, loss of offsite overheads and profit can be calculated using the following different possible formulas: Hudson, Emden , or Eichleay formula.

But these formulas were never supposed to produce accurate estimates of the contractor's actual overheads. Instead, they provide an estimate of the contractor's incurred costs. Contractors can and should, whenever feasible, rely on them but should present better evidence of actual incurred loss whenever possible. It is important to keep in mind that these formulae by themselves don't prove anything, they merely develop the contractor's claim for damages. They are only instruments to help tally up the damages once the causation has been judged. Contractors should, as a result, focus on producing credible evidence of causation and loss when making claims. (King, 2022)

Liquidated Damages:

Pre-established amount, usually amounts specified in contract which one party agrees to pay the other in the event of a breach. Typically, LDs are payable if the other party suffers certain losses as a result of the breach. The amount of the LD are payable quite apart from a requirement that the non-breaching party prove any actual damages. Very often, this loss will be the loss of liquidated damages – that is, damages designed to compensate the owner. Under this type of provision, a liquidated damages clause is usually incurred when the contractor fails to complete practical work to the extent set out in the completion date of the contract and are calculated on a daily or weekly basis. LDs are not penalties, LDs are damages set out in advance when a contract is signed based on an estimation of a real loss the client will pay if the contractor does not reach the completion date. They are most often set out at a fixed daily or weekly total, although more complicated formulae may exist if one enters into a phased, sectioned or partial possession, and so on. (Smith & Green, 2016)

In short, LDs are a damages-based remedy for delays in completion, consented to by the parties under a construction contract and usually along the following or similar lines:

"If the contractor fails to complete the work within the contract time or fails to achieve any of the contract milestones, the contractor agrees to pay the owner X per day as liquidated damages to cover losses, expenses, and damages of the owner for each and every day which the contractor fails to achieve completion of the milestone work or the entire project." (Schonrock, 2016)

There are a number of different approaches that construction contracts may adopt to calculate LDs. The daily rate charge is a lump sum that is paid for every day of delay, whereas the percentage of contract value schedule bounds the damages to the value of a capped proportion of the contract. In a nutshell, LDs are a contract-based remedy for late completion of the contract. It must be agreed to by the parties in the construction contract and normally takes the following or similar form:

1- **Daily Rate:** (Amount of LDs per day according to the annex of contract x No. of delayed days) = Total Amount of LDs payable by the Contractor.

For example, a project might have a liquidated damages rate of €10,000 per day, with a 5 percent ceiling on the entire contract price, whichever is less. In such a case, on a €10 million project, a 10-day delay will bring an immediate loss of €100,000 (10 days x €10,000 each day).

2- **Percentage of Contract Value**: Liquidated Damages (in % of Contract Value per week mentioned in the contract x No. of delayed weeks) = Total LDs payable by Contractor.

Liquidated costs owing to project delay can also be connected to milestones or deadlines mentioned in the contract, such as: A Contractor completed a € 10 million project two weeks later than expected. The contract calls for LDs of 1% of the total contract amount for any week of delay on the completion.

Total contract amount: €10 million.

Weekly liquidated damages rate: 1% of € 10 million = € 100,000.

Delay duration: two weeks.

As a result, the delay liquidated damages in this instance would be € 200,000

(2 weeks x € 100,000 each week).

Capping of Liquidated Damages:

In order to avoid penal consequences in the case of really excessive penalties, the limitation of delay liquidated damages is, nowadays, stipulated and capped in the contracts, by means of a percentage of the entire contract value or an equivalent fixed sum. In the above-mentioned example, if the contract provides for a 5 per cent cap, the liquidated damages for delay, irrespective of the time of its occurrence, will be € 500,000 (5 per cent of € 10 million).

Liquidated Damages Calculations:

LDs are not penalties, so they must be calculated upon actual costs, amounts, and estimates before they are decided and settled in the contract. In cases where they are not based on actual costs, they might be supposed to be penalties by courts and hence they will be void. Even though, this is improbable because the courts are usually unwilling to interfere in contracts agreed mutually by two contractual parties of comparable positions.

Therefore, LDs include, but are not limited to:

- Loss of rent.
- Loss of income.
- Fees.
- Storage costs.
- Rental costs.
- Fines imposed by third parties.
- Financing costs.

There must be a relationship between all of the losses anticipated in the contract and the breach of contract, which means that the damages must be directly resulted from the delay and cannot be irrelevant. (Turner, 2021).

2.2.2 Acceleration Claims

Acceleration is an approach in construction that involves the Owner instructing the Contractor to increase the pace of the construction works and adding extra resources to complete work faster than expected and finalize the project or a specific section on a date earlier than the contractual completion date. It is commonly utilized for a variety of applications to increase on-site productivity. Acceleration can also include resequencing the works or speeding the project to make up lost time caused by a directed variation order. Some of the possible reasons for directing acceleration may include:

- deadlines with tenants or end-users,
- funding or loans necessities,
- tax benefits,
- avoid some expected delays (e.g. seasonal or closure times),
- and reduction of the owner's overhead expenses.
- a lack of or the inclusion of exculpatory terms in the contract that prevents the owner from collecting damages for delays.

The contract may specifically state the right to mandate the acceleration of work. However, the project’s parties should always take into consideration that sometimes these acceleration measures can be a double-edged weapon and may have a

negative effect on the rate of the progress of the project. Every technique used may result in a loss of production. Overtime, over-manning, and trade stacking are popular ways for increasing daily productivity. Nevertheless, it should be noted that doubling the hours or the number of people does not make production double. As after a while, overtime becomes a relatively expensive way of boosting man-hours on the job because of premium pay and – potentially – because more supervision and assistants are needed to maintain performance. Also, increasing work hours by 10 hours each week reduces efficiency. There are two types of overtime: spot overtime, which only lasts for a short while (from 7 to 10 days), and protracted overtime, which lasts at least three weeks. It is common to employ overmanning to advance a project by more gradually humane means than overtime, by increasing the number of workers of the same nature of works. However, congestion and less direct supervision might reduce productivity. (Long, 2011)

Trade stacking (increasing the number of trades operating at the same time) or stacking (where one worker remains in multiple trades), or both, cause congestion and stress for the trades. Congestion, a scarcity of supervisors, more training, and accidents all contribute to decreased productivity. If working longer hours were a reason for their tiredness, physical stamina would be the principal reason, not overtime. However, the word at the end of the sentence kills this idea. Extended hours result in lower-quality work, which leads to rework. More man-hours can be gained via overtime, for instance, but that is not the same as upping hourly productivity. (Allen, 2021)

When deciding what kind of acceleration to use, it really depends on what kind of movement you’re doing and the size of the space you have available. Additionally, overtime is expensive because the hourly rate of labour is often 50 per cent above the normal salary. Any contractor should address acceleration costs like any other modification order or claim – with complete documentation and regular updates/cost presentation to the owner. This includes trying to document accurately and quietly any further costs that result from acceleration and providing proper receipts to the greatest extent possible. These documentation should include:

- Extra costs that exceed the planned time and shifts.
- Additional labour expenses.
- Additional supervision expenses

- Additional equipment expenses.
- Expediting charges for the subcontractor acceleration works.

They should be presented by the contractors as real costs as accurately as contemporaneous documentation will allow. But which cost approach is appropriate depends on the case, and even when there are no records on contemporaneous cost, the effects of acceleration may often be analysed and quantified. Because accelerative efforts might decrease productivity, contractors should try to quantify productivity so that they can compare productivity rates before and after acceleration.

Maintaining precise plans and thorough daily reports are critical for documenting accelerated works. Contractors and owners should remember that the costs associated with accelerating work, whether or not the acceleration effort achieves its goal – such as fully mitigating a delay – can still provide cost recovery. (Jones, 2003)

2.2.3 Disruption Claims

Disruption of a construction project poses a significant challenge for contractors, as any deviation from the planned schedule can lead to financial losses unless compensation can be sought from the client. However, it is widely recognized that proving disruption claims in construction is challenging, often due to insufficient or inaccurate project documentation. Nevertheless, the financial impact on the contractor due to lost productivity or decreased efficiency in such situations is undeniable. Disruption is a “disturbance, hindrance or interruption to a Contractor’s normal working methods, resulting in lower productivity or efficiency.” according to the Society of Construction Law, Delay and Disruption Protocol (SCL Protocol, 2017).

Disruption commonly leads to decreased productivity, which in turn leads to higher labor expenses. Additionally, disruption can cause critical delays and incur costs associated with those delays. Disrupted work refers to tasks completed with less efficiency due to disruptive events. Contractors may seek reimbursement for costs resulting from disruption either through compensable events outlined in the contract or by alleging a breach of contract. Examples of disruption include “site access problems, changes in the work sequence, design changes, crowding of trades, fragmented labour, overtime, rework, labour availability and poor morale.” (King, 2022)

It is common that people in the industry sometimes mistakes disruption for delays. However, “The distinction between delay and disruption is important, but rarely articulated, and is to an extent a matter of definition. Delay is usually used to mean a delay to the completion date, which presupposes that the activity which was delayed was on the critical path. Disruption to progress may or may not cause a delay to overall completion, depending on whether the activity delayed is on the critical path as explained above, but will result in additional cost where labour or plant is underutilized as a consequence of the event.” (Dennys & Clay, 2015).

While the two common claims often have similarities, only critical activities are pertinent for prolongation costs and may warrant compensation. Disruption claims pertain to the lower-than-anticipated productivity of labour and/or equipment. Disruption can stem from critical activities, although more commonly, it arises from noncritical activities. As a result, successfully securing an extension of time claim may not necessarily lead to recovery of losses attributed to site disruption. Nonetheless, it is often the disruption, rather than critical delays, that accounts for a significant portion of the incurred losses.

Disruption can occur from different reasons and events, with both direct and cumulative effects on production. The American Association of Cost Engineers International (AACE) Recommended Practice No. 25R-03 - Estimating Lost Labour Productivity in Construction Claims could be an excellent resource for a more in-depth assessment of frequent sources of productivity loss. Some of the typical reasons seen in the construction and infrastructure industries include:

Acceleration	Material, tools and equipment shortages
Inclement weather	Out-of-sequence works
Cumulative impact of change	Defects and rework
Start/stop events	Site conditions
Slow / ongoing issue of documentation	Untimely approvals or responses
Learning curve	

Figure 7: Reasons for Disruption in Construction (AACE,2004)

Disruption claims are potentially more difficult to identify, verify, and measure than other types of financial claims. Productivity loss is frequently not discovered until after it has occurred, and establishing which work elements and trades are suffering losses as a result of disruption is dependent on the quality of data used to explain

why those losses occurred. By questioning supervisors on Site, the contractor may typically determine the nature of the events that happened and the likelihood of a successful claim. To determine cause and effect, factual, contemporaneous project documents such as project communication, progress reports, site diaries, timesheet allocation, and meeting minutes must be analysed. The more accurate the records, the higher the chances of succeeding. (Glover, 2015)

The first step in choosing whether to pursue a Disruption/Productivity claim is to determine eligibility. To show entitlement, the following must be examined in relation to the applicable contract:

- The event producing interruption must be compensable (under contract or at law),
- The event must result in an increase in costs.

After proving entitlement, the next step is to demonstrate how the disruption has affected the rate of the works by proofing the following:

- 'cause-and-effect', explain how the interruption caused a loss of productivity and how it was quantified.
- Include the technique and reason for computation.

Whereas there is not any approved technique for contractors to substantiate a Disruption Claim, the SCL Protocol states: ‘Disruption is demonstrated by applying analytical methods and techniques to establish the loss of productivity arising out of the disruption events and the resulting financial loss.’ The SCL Protocol introduced several methods to analyse and determine the loss in productivity and classified them into productivity based and cost-based methods, as shown in fig. 8 below.

Productivity-based methods	Cost-based methods
1. Project-specific studies:	1. Estimated v incurred labour
(a) Measured mile analysis	2. Estimated v used cost
(b) Earned value analysis	
(c) Programme analysis	
(d) Work or trade sampling	
(e) System dynamics modelling	
2. Project-comparison studies	
3. Industry studies	

Figure 8: Methods for Determining Lost Productivity (SCL Protocol, 2017)

The validity and accuracy of these processes are dependent on the availability of relevant and current project documents. In many circumstances, the quality and completeness of project documents are the crucial elements in pursuing any

Disruption Claim. Aside from contractual notices, the following record categories might be valuable in compiling a Lost Productivity Claim:

- programme status updates,
- monthly report meetings and minutes,
- Substantiation of costs
- site diaries,
- daily logs and timesheets,
- and site photos.

The capacity to obtain contemporaneous recordings of events at any time and stage of the project gives the foundation for developing a Lost Productivity Claim. This is required to complete the cause-and-effect relationship and to use an analytical approach for productivity analysis. (Glover, 2015)

2.2.4 Delayed Payment Claims

Delayed payment claims in construction contracts refer to formal requests made by contractors to receive payment for work completed, materials supplied, or services rendered, which has not been paid within the agreed-upon timeframe specified in the contract. These claims arise when the project owner fails to make timely payments as per the contract provisions, leading to delays in the contractor's cash flow and possibly affecting their ability to meet financial obligations and continue work on the project. Delayed payment claims involve submitting a formal request for payment to the project owner for the work completed, materials supplied, or services executed as per the terms of the contract.

Delayed Payments could arise from several causes, some of which can be mentioned in the list below:

- Delays in the owner’s financial arrangements.
- Owner delays the payment for his own financial advantage.
- Delays in the payment approval and certification.
- Improper payment cycle.
- Unrealistic Cash flows.
- Disagreement on the valuation of the executed works.

Contractors must provide documentation, such as invoices, progress reports, timesheets, delivery receipts, or completion certificates, to support their claim for payment. This documentation demonstrates the completion of work or delivery of materials/services in accordance with the contract requirements. (Dubey, 2021)

The contractors must then identify and document the specific instances of delayed payments or non-payment by the project owner with official notices by the appropriate means of communication. The parties may then engage in negotiations or dispute resolution processes outlined in the contract to resolve the payment issues and reach a mutually acceptable solution. This may involve tracking payment deadlines, payment schedules, and communication with the owner/client regarding outstanding payments. (Ansah, 2011)

In some cases, delayed payment claims include calculations of interest or penalties as per the terms of the contract or applicable laws/regulations. These interest or penalty charges may be applied to the outstanding amount owed by the owner/client for the delayed payment. For example, FIDIC (International Federation of Consulting Engineers) has different formulas for delayed payments, but the FIDIC Red Book states the contractor is entitled to receive financing charges compounded monthly on the amount unpaid during the period of delay calculated from the due date of the payment. The financing charges recommended by FIDIC are calculated upon the discount rate of the central bank of the country in which the project is executed (FIDIC Red Book, 1999). However, the two parties of the contract can agree on changing the financing charges calculations or can agree to calculate it based on other criteria. In other cases, the parties may agree on ignoring the provision of the financing charges from the contract, yet it is not recommended as it can affect the contractor’s cash flow negatively in case of delaying the payments by the project’s owner.

Furthermore, FIDIC also gives the contractor the entitlement to suspend the works or reduce the progress of the works in case of delayed payments after giving an official notice within a period agreed upon in the contract. If the owner still does not pay the delayed payments after such period the contractor should have the right to suspend the works or reduce the progress as he deems appropriate, the contractor will also have the right to claim an extension of time and recover any incurred costs implicated from such suspension. In extreme cases, the contractor can then, by giving further

notice, terminate the contract with the employer and claim for the value of the executed works, the extra incurred costs, and loss of profit. However, this case rarely happens as contractors would tend to maintain their relationships with the employers and avoid further disputes. (Dubey, 2021)

Overall, delayed payment claims are a means for contractors or subcontractors to address and seek resolution for payment delays by asserting their rights to receive timely payment for work performed or services rendered pursuant to the contractual provisions. Thorough documentation, communication, and adherence to contractual procedures are essential for effectively managing and resolving delayed payment issues in construction projects.

2.2.5 Scope-Related Claims

There are different types of claims that arise in the construction industry which are related to the project's scope; they arise when there are disputes or disagreements between the parties involved regarding the scope of work defined in the contract. These claims typically involve assertions by the contractor that some additional works were not originally included in the contract scope and are necessary to complete the project or meet the project requirements. Examples of these claims could be:

Design Changes:

Design change claims in construction contracts arise when there are alterations or modifications to the original design specifications or drawings after the contract has been awarded and work has commenced. Typically, these claims feature a request for compensation by a contractor or subcontractor for the effect of design changes on project cost, schedule or performance. These changes might be just as relevant as the initial project and could be initiated by the project parties, the architect/engineer, the client, or other project stakeholders. This would have a significant effect on the contract scope of work and will require redesign of construction methods, materials and/or project sequencing to accommodate the changes. (Morris, 2023)

It can also impact the project schedule by increasing the time needed to complete the corrected work or interfering with the project's proposed construction sequence. Consequently, extensions of time under the contract are claimed by the contractor for

delays caused by design changes on the part of the engineer, and the owner must compensate the contractor for the prolongation costs (or allowances) or for extended overheads, as well as for the cost that the contractor incurs when implementing the changes. These expenses can include extra labour, materials and machinery related to altering the construction plans or executing the revised model.

Design changes may include revisions to or additional work relative to the base scope, and they are usually subject to contractual provisions defining the process for designing changes, such as processes for notifying and documenting design changes, procedures for submitting change orders, pricing-adjustment requirements, dispute resolution, and allocation of responsibility for additional costs or delays related to design changes. (Morris, 2023)

Differing Site Conditions:

Differing site condition claims in construction contracts arise where contractually anticipated/indicated site conditions differ from the conditions as discovered during construction. Such claims often invoke change-in-conditions clauses by declarations seeking an amendment to the contract amount, contract milestones or scope of work as a result of the change.

They typically arise where a contractor encounters or discovers:

- subsurface or environmental conditions at the project site that were not reasonably foreseeable by the contractor at the time of the contract based on the contract documents,
- physical conditions at the project site not shown by the contract documents to exist, or
- physical conditions at the project site that either differ in degree or are not of the type shown by the contract documents to exist.

Site data for construction contracts might include information derived from site investigations, surveys or geotechnical reports regarding pre-existing site conditions. Here are two of the contractual representations by which site conditions claims can be differentiated:

1) The site conditions of the project, where it is alleged by the contractor that the actual site conditions are materially different from this contractual

representation to an unreasonable extent, leading to unforeseen difficulties, delays, or increased costs.

2) The estimate of the site conditions required for the work, where it is alleged by the contractor that the actual site conditions are materially different from this estimate to an unreasonable extent.

This might result in changes to the sequencing and scheduling of construction works such that materials, equipment and construction methods must be adapted in order to deal with unexpected hydrogeological conditions discovered on site. Such conditions could require further excavation, dewatering, shoring or remediation to control and limit risks to safety and regulatory compliance. Nearly all construction contracts allow contractors to file change or differing site conditions claims as a means of recovering additional costs stemming from adverse conditions that the contractors did not anticipate in the course of construction at the project site.

These costs could be for extra labour, equipment rental, materials, subcontractor charges or overhead for dealing with differing site conditions that would necessitate the contractor to perform additional work to complete the awarded project. Contractors are required to notify the project owner immediately upon identifying differing site conditions, to document the actual site conditions encountered, the effect of the conditions on construction, and the resulting cost escalation. (Long, 2011)

It’s important to give notice in a timely fashion, and to document well, so that, when necessary, differing site condition claims can be proved and adjustments to the contract terms requested or imposed.

2.3 Claims Management Practices

Many believe conflicts are unavoidable because the construction industry is usually a project that consists of numerous parties with various needs and expectations on a project. Contracts cause disagreements precisely because it is possible that the parties disagree on what the contract says and what to implement. They cannot specify how to interpret or apply the contractual provisions. It is widely accepted that the very process itself implies some level of conflict and, therefore it is only sensible to pay greater attention to systems for claims management. In other words, these

claims management systems should be put in place at a very early stage of a project – even prior to the drafting of the contracts. (Mirza 2005)

The claims management process is required to be effective, Successful contractors should strive to avoid litigation and arbitration when settling claims. All participants in a project will, therefore, naturally want to ensure that problems that can result in claims are avoided as much as possible. The key strategy is to foresee and prevent issues before they arise. And if a problem does arise, a claim becomes less likely if each party timely acknowledges and settles it prior to becoming uncontrollable. Significant claims can negatively impact both the owner and the contractor. Owners risk losing rental income, losing funding and, in worst-case scenarios, vacant buildings. Contractors risk bankruptcy from payment delays. Given that preventing claims is far less expensive than litigating them, it is beneficial for anyone in the industry to understand the claims management processes thoroughly. (Bramble, 1990)

These processes should run concurrently with contract management to achieve the desired project outcomes. Mismanagement of construction claims impacts the projects costs and can cause severe damage to all parties involved. Success in the construction industry relies on adopting a win/win approach throughout the project's lifecycle, ensuring mutual success. (Mirza, 2005)

Construction claim management involves various sub-processes, which are outlined into fundamental procedures for managing claims and change orders, these processes might have different naming and different categorization based on the project, the organization, or even the market. However, the procedures, tasks, and activities done through these different categorizations are more or less the same in each market (Levin, 2016) and hence these processes could be divided into the following:

1) Claim Identification Process; recognizing the potential of a claim.
2) Claim Notification; notifying relevant parties of the claim events.
3) Claim Preparation and Examination; analysing the time and cost impacts of the events.
4) Documentation Process; systematically and accurately documenting the events.

5) Claim Submission and Presentation.

6) Claim Negotiation; negotiating claim impacts, consequences, and compensations.

7) Dispute Resolution Mechanisms; resolving disputes and settling claims

Figure 9: Claims Management Processes (Azmi, 2018)

Construction Claim Identification

The initial and arguably most crucial step in the claims management process is the identification of a claim situation. It is important to recognise these situations when they happen, which means timely and accurate identification of a construction claim is crucial to the process. After all, very good claims can be lost simply because they weren't timely claimed. So construction managers must learn to recognise all the ways of claims. This awareness not only assists in identification of potential claims but also sheds light on systemic problems in the management of contracts at all levels in the company. (Enshassi & El-Ghandour, 2009)

The author's analysis of existing studies shows that there are three most common problems in the identification of the claim, namely 'insufficient knowledge of a project contract by site staff', 'difficulty for pinpointing any problems on site', and 'ambiguous procedures for identifying a claim'. (Rostiyanti & Hansen, 2017).

Claim identification is most dramatically impeded when contract documents are not understood by site staff who hardly even know the lines of the contract. It is also essential that all the site's personnel comprehend what contractual terms were agreed by both parties, so they can refer to the clauses when problems occur. Additionally, the contract should clearly define procedures for claim identification to remove doubt. (Easton, 1989).

It is preferred that staff skills and awareness will also be identified as key issues in claims discovery. A site employee must read and understand the contract terms before a new project commences as well as keep a close watch for claims, variation orders and other instructions after a project has officially began. If site staff have poor awareness, lack the necessary skills and don't know their rights, non-negotiated task agreements will result in important claim-making activities being missed, with considerable costs involved. (Bakhary, 2013)

According to available studies, three primary issues complicate the claim identification process, which are "insufficient construction contract knowledge by project site staff", "difficulties in detecting any problems on site", and "ambiguous procedures related to claim identification". (Rostiyanti & Hansen, 2017).

Construction Claim Notification

Following the identification of claims, it is essential to provide a notification. Has the contractor has the will to submit a claim for an extended time or additional costs under the contract for a difference in the conditions of the work, the owner or his representative must be given written notice of the claim or the variation instruction. This alert allows them both to check conditions, fact-check, and sort things out, while the details remain relevant (Mitchell, 1998)

Notification of a claim refers to an activity when a person informs the other party about a possible issue in peaceful means. It is of course necessary to comply with any time limit obligations, and the standard clauses obliging the other to notify the occurrence of an event 'as soon as possible/practicable' with a particular time bar also apply. The initial claim notice letter has to be "brief, clear, straightforward, conciliatory, and cooperative. It should outline the problem and notify the other party of the potential for increased time or costs" (Sawyer & Gillot, 1990).

Claim Preparation and Examination Process

After this initial claim filing, a careful review is undertaken to determine the merits of the claim. This includes determining the potential amount of compensation sought. Professionals may interview project personnel to gather evidence. Project files, videos, and memos are primary sources to demonstrate time and cost for claims submitted. Established methods exist to calculate the impact of events on project timelines and expenses. These methods belong to one of two broad approaches: time/schedule impact analysis (also called the method of delay analysis) and cost impact analysis. Time impact analysis depends on the delay analysis skills by quantifying project completion delays to illustrate the relationship – cause and effect ties – between claimed events and project execution. (Enshassi & El-Ghandour, 2009)

The second sub-process is cost impact analysis and claim pricing; its goal is to provide the other party to the contract with a detailed explanation of the additional costs incurred or anticipated as a result of a contract modification. Every construction contract will have this exact detail about the cost of each item in order to have the capability to comprehend, negotiate and justify the additional amounts they will charge for the contract. Pricing claims can get further distinguished (Shaikh, et al., 2020):

(1) Fixed price/budget reimbursable: The price at which the work will be done is worked out in advance and the owner reimburses the contractor against the claim on the basis of the final cost incurred.
(2) Fixed price/costs-plus reimbursable: Again the price at which the work will be done is worked out in advance, but the customer pays to the contractor the costs incurred in addition to a predetermined percentage of these costs.
(3) Pre-negotiated hourly fee: The customer and the contractor have agreed on a forward pricing rate (known as target hourly rates) using a schedule of costs or an hourly budget (pre-priced labour and materials). The hourly claim value is negotiated in advance.
(4) Post Pricing: usually price is determined after risks have been incurred and additional costs are known.

The pre-pricing methods are usually the preferred methods as they reencourage the quick updating of the progress schedule, keeping an accurate record of the balance of work, the final contract price and the final completion date.

The challenge lies in identifying and isolating all the changes and their associated costs. Claimants need to maintain detailed cost records, with thorough descriptions of the work performed. This moves them to the second level of inspection, where they can calculate all the costs of the affected work since it was changed. The main problem throughout the claim assessment according to the available data is just the lack of record and documents required to do the assessment and estimate the amount of claim. This demonstrates that record and document level details are pivotal in the claim quantification process, and the availability of such records is crucial not only for claim quantification, but also for its end-to-end success in the claim submission process. An unfortunate outcome is the lack of written records, which ‘serve as our main source of learning’ about what went wrong and why, flagging the issue of poor documentation alongside poor communication, which Rostiyanti and Hansen (2017) found to be a major concern.

Claim Documentation Process

The hard facts that support the claim should be carefully put together to show the accurate history of the claim. Effective defence strategies can quickly dismantle unsupported evidence and claim costs. Proper documentation is crucial for both the owner and contractor to avoid unproductive confrontations. Keeping lines of communication open and problems dealt with quickly can help prevent disputes, and keeping good records which should encourage cooperation. The cheapest and most effective insurance against claims is to keep a detailed record of the work done (Hassanein 2008)

Parties can never have too much documentation to make or support a claim, a guided missile, consisting of all change orders affecting the subject of the contract work, including the dates of notice, best and worst case estimates of cost, invoice date, requested time and amounts, approved time and amounts, and approval dates as well. Claims should be recorded by contractors, with descriptions, dates they were submitted, amounts and times requested, amounts and times granted and the owner’s notes on decisions. (Kartam, 1999)

Great records help facilitate change negotiations and disputes; project progress schedules, daily and weekly reports, change order logs, photos, and minutes from meetings can all be cited as evidence to support the contractor's case. A Document Management System, also known as a DMS or repository, designed specifically to store and retrieve information in unstructured forms such as all electronic mail, electronic documents (for example, scanned images, word-processed documents, spreadsheet files, reports, letters, specifications, drawings) appears as very strong evidence of a claim submitted by the contractor. (Enshassi & El-Ghandour, 2009)

Claim Presentation and Submission Process

Presentation of a claim should be well-organized, well-constructed and factually supported. A claim needs to be submitted to a relevant entity with the necessity of being accepted. Therefore, it should be formatted to clearly highlight the breach of a contract requirement. The contractor must then demonstrate that the owner was in a way the cause of that damage. The presentation should be divided into two parts: entitlement and quantum. The entitlement section lists the facts and law upon which the entitlement to recovery is based, and the quantum section calculates the amount recoverable. (Kululanga & et al., 2001)

It is fundamental to show the client the claim documents ready for review, and this stage of documentation must be carefully managed; any errors in this stage might affect the entire claim process. The common issues highlighted in available studies were lack of access to documents, missing trained staff to help with claim filing and preparation of claims, and poor or unclear presentation to claims officials. additionally, research have revealed that lack of onsite documentation leads to troubles in presenting a good case with invalid details.

Effective presentation of a claim demands knowledgeable, skilled, and experienced personnel who understand the claim process and can effectively organize detailed submissions and defend them. You need to know how claims are supposed to work, and how to present detailed submissions in an effective way. Yet, it is difficult to employ experienced staff for claims preparation by contractors due to which the quality of claims representation might be impacted, and clients might result in rejecting these claims. The heavy workload further complicates efforts to focus adequately on claim preparation, underscoring the importance of hiring specialized

claim management professionals to address these issues effectively. (Enshassi & El-Ghandour, 2009)

Claim Negotiation Process

The contract administration process offers numerous opportunities for project stakeholders to discuss and settle construction issues prior to their escalatoin into formal claims. Key procedures such as the variation processes and structuring payment schedules are particularly effective in this regard (Bramble & Callahan, 1992).

Negotiation, involving communication and mutual decision-making between parties, often results in contract modifications (Ahuja et al., 1994). Effective negotiation plays a critical role in settling claims, avoiding disputes, and maintaining positive project relationships, although it is acknowledged as a time-intensive activity for project managers (Ren et al., 2003). Negotiation is widely considered the most efficient and straightforward method for resolving claims, as it involves both parties discussing the issue and seeking a compromise (Riad et al., 1991).

A well-prepared negotiation involves ensuring all the available data and records are existing, contemporary, and complete, narrowing the scope of discussion to avoid unnecessary conflicts, understanding one's own weaknesses to strategically concede, anticipating potential issues, and predicting the opposing party's responses. In construction disputes, effective negotiation skills are crucial, often more so than being strictly correct in legal terms, as thorough preparation significantly enhances negotiation outcomes. (Easton ,1989)

3. Dispute Resolution Mechanisms

It should be noted, as already stated in the previous chapter, that construction disputes commonly arise from disagreements, conflict, or controversy connected with planning, executing, and, sometimes, finishing construction projects. These may be between entities up and down the chain of construction and may pertain to the whole project, or to a single portion of it, arising from the different issues listed above, eg, delays in schedules, one party's failure to perform to contract, scope changes, payment disputes, and other reasons. As a consequence, construction disputes occur when either party alleges that the counterparty breached the agreement in some way. (Upcounsel, 2023)

If the construction disputes or claims between project parties cannot be resolved at the contract level, then they can turn into a claim of dissatisfaction, and if the matter continues, this claim can be escalated to a dispute. Disputes are common – almost inevitable – and further complicated in the construction industry with often badly stated technical issues, which non-technical decision-makers struggle to understand.

To reduce the chances of disputes, each party of a contract will take one or more alternatives of protecting themselves before any project kicks off. Another set of techniques for avoiding conflict include, but is not limited to:·

- Reading and understanding the terms of the contract·
- Mediating and negotiating ambiguous terms in the contract
- Proper pre-construction preparation such as taking, counting, punch list, estimate, concluding terms with subcontractors, scheduling, and procurement
- Reviewing the feasibility of all the schedules and preparing for delays in the schedule with implications.

In addition, at each interval you have to improve each phase of the construction process, where dispute resolution starts with the contract itself and the inclusion of dispute clauses. (Upcounsel, 2023)

Traditionally, disputes were resolved through negotiation, administrative appeals, mediation, or litigation. But having acknowledged those issues, the industry has developed a range of other processes – alternative dispute resolution (ADR) – that

emerged from the desire and necessity of public agencies and industry associations alike to provide a faster, more affordable, and more efficient way of resolving disputes that otherwise end up in litigation. This chapter will introduce an overview of a number of ADR mechanisms commonly used in construction, each mechanism is unique, and different, where one will be more beneficial and suitable than others for any particular parties ; each mechanism also presents features, benefits and drawbacks prior to the most appropriate suitable mechanisms is to be chosen. (Levin, 2016)

3.1 Negotiation

Negotiation is a type of dispute resolution procedure in which parties in dispute engage in discussion and communication attempting to reach mutually acceptable means through which to settle a dispute. In contrast with the more formal, adversarial processes that usually accompany formal legal processes such as litigation or arbitration, negotiation has the benefit for parties of being less formal, less adversarial, and also involving more flexibility and control over the outcome. It's a form of collective rationality in which a shared perception of interests is developed, in which different options are evaluated, and in which different parties can arrive at agreements to satisfy everyone. The parties may brainstorm options and proposals through the process, and determine what their 'joint gains' (ie, interests that can be and should be agreed to by the parties) are and where there are overlaps for their objectives. (Carvajal, 2023)

It can be done directly between the parties or with assistance from a neutral third party ('third-party neutral') – a sort of mediator or dispute resolution specialist. Because its goal is to settle the dispute on terms that satisfy the interests and concerns of both sides, negotiation is win-win, and therefore avoids the costly win-lose outcome of dispute settlement. Here are some reasons why negotiation is important. First, when negotiation works, you end up with cooperation, rather than as – adversaries. Relationship preservation is more likely with negotiation than with litigation, which typically concludes with a winner and a clear loser. Second, negotiation is cheaper. It takes less time, requires fewer resources and less money – and less emotion, for that matter – than litigation. So, it's better to negotiate – and

therefore avoid the parties having to put themselves through hard times or, worse, an expensive litigation.

Beyond that, brainstorming during negotiation encourages action, and challenging each other to come up with more creative, case-specific solutions than they might have had they been left out. Thus, negotiation empowers individual determination by allowing parties autonomous control over the outcome of disputes between them. Studies cite those negotiators ‘do not delegate to some bored judge or arbitrator the details of the case’ that settle the agreement apart. Negotiation as the most adaptable and informal dispute resolution is also voluntary, noncommittal, and mom binding. A negotiator represents a party to advocate from that side’s point of view.

The sooner you start negotiating, the cheaper your resolution will be, and the less there might be for you to disagree about. Even if you’ve started litigation, you should still negotiate. Negotiation often takes place ‘without prejudice’, meaning that judges cannot take what is discussed or agreed in bad faith at the end of litigation. That means parties to a negotiation can explore the full range of options, and unless the negotiations ‘break down’ (if legal proceedings are instigated, efforts to resolve the dispute through negotiation are deemed to have broken down) negotiations will not adversely affect parties’ legal rights. Because the process is private and confidential, negotiation can also help to preserve reputations and relationships. (Qadeer, 2020)

3.2 Mediation

Within the field of Alternative Dispute Resolution (ADR) as a whole, mediation stands apart because of its private, informal, and consensual nature. In the mediation process, a third-party neutral facilitates conversations between the parties with the aim of helping them to reach a voluntary, self-determined resolution. Acting as a mediator, the third party assists with negotiations between the parties, but does not make a binding decision. The parties have the flexibility to conduct the process as they see fit and to remain fully in charge of the result.

In most mediations, one mediator will be used, but often parties in dispute will question the use of a panel of mediators. Mediation has, if anything, only grown in importance in recent years as part of the toolkit of ADR. (LRC, 2010)

In a textbook, the parties jointly select a mediator who presides over the proceedings. However, the mediator is not a decisionmaker. The mediator's main role is to facilitate the parties to come to a mutually acceptable settlement, rather than pronouncing on right and wrong or applying legal principles, the mediator helps the parties weigh the risks of a dispute versus compromise. Each side agrees to whatever guidelines the parties draft for the mediation, and this is the first concrete step in finding a solution. (LRC, 2010)

Mediation works only if both sides are committed to working together rather than beating each other, and if both sides are committed to finding a joint outcome. It works only if both sides are committed to approaching the problem collaboratively and non-adversarially. A common mediation process usually includes the following stages:

(1) The exchange of written position papers in advance, as noted above, which are also shared with the mediator.
(2) Each party's facts and arguments presented in a joint session; usually without cross-examination but with the mediator asked to ask questions.
(3) Private sessions where the mediator meets with each party separately, and may talk through issues, find common ground for the parties, and explore risks and successes through this process.

The mediator is the collaborator, working in between the parties to help shape a resolution. Often, mediators deliver their own evaluations of the positions that are presented and may offer their own recommendations. The mediator will ideally help the parties to resolve their own issues, not make the decision for them.

Mediation typically starts with an initial joint session during which all the parties and their respective representatives are seated together, and the mediator explains the process, his or her role, and the procedure for how the day will likely unfold. After establishing a safe framework for the session, the mediator asks parties to take turns in making opening statements. Each session, the mediator meets privately with each of the parties to hear and discuss their concerns and input confidentially, separately.

This gives them the ability to see their cases objectively and to explore more options than they might have otherwise. Crucially, the parties control their mediation, and the process is driven by their empowerment and ability to settle their issues voluntarily.

The parties can end mediation at any time, no questions asked. Among the advantages of mediation are its cost-effectiveness, minimal time commitment, nonbinding nature, and confidentiality, and, in virtually all mediation agreements, strict confidentiality clauses. (Wissler & Hinshaw, 2021)

Mediation also is flexible and can be crafted to suit the needs and creativity of both the mediator and the parties. In general, mediators look for common interests among the parties. A limitation of mediation is that many mediators are trained to follow a 'get to yes' approach – to achieve some form of resolution no matter what regardless of the underlying issues faced by the parties. This is important to note because if the same mediator is presented with parties who are in discordant or incompatible positions, as commonly happens when they come before the court under court order to mediate, a 'pushy' mediator may become provoked by continued disputes or discussions and try to move to settlement negotiations by attempting to shift positions of evidence and contracts, to reach a settlement for settlement's sake. This leaves the parties frustrated and with nothing to show for the expense. The key to successful mediation is often finding a mediator with construction and litigation experience, able to create trust alongside his objectivity. (Colb, 2014)

Although a mandatory mediation that is legally required by a contract may lead to success, the best mediation is when the parties engage voluntarily, despite the contractual requirement, because they see the dispute as a shared business problem, and they are motivated to find a solution that respects the value of future commercial relationships. If the parties frame the dispute as a joint problem, focus their energies on seeking compromise, and give up the notion that one party must prevail over the other, often they can find outcomes. (Indovina, 2020)

Mediation can reach high rates of success because the process gives each party an opportunity to have their perspectives understood, and the parties themselves have a say in crafting the outcome. Mediation settlement agreements can therefore include provisions that may be broad enough to fairly address both personal and commercial interests, as well as other interests that would require decision-making far beyond the scope of an imposed court decision. (Bushe, 2015)

3.3 Litigation

Litigation is a formal and legal process used to settle legal disputes which may arise during and or after a construction project has been awarded. Construction litigation area of the law whereby disputes is being solved in a court of Law. The Parties may have disputes on arising issue which are relevant to the construction law. Construction litigation is deliberately a civil lawsuit rather than being a crime and motion of criminal prosecution which may also come in, depending on the scenario of what happened and what must be settled. Construction disputes differ from criminal prosecution, that is they are not within the same area neither do they share the same traits, but construction disputes are governed by Civil laws procedures and the rules of proving burden which are different from criminal prosecution, unlike criminal prosecution. (Ellison, 2020)

In construction disputes, a party or both parties decide to resolve their differences in the court of law, they present their cases and documents as evidence, the case is considered before a judge or a jury who in turn made their final ruling as final conclusion. The process is ordinarily procedural: a plaintiff initiates the dispute by filing a complaint against a defendant alleging what the complaint is; the defendant files an answer to admit or deny the allegations; the parties engage in discovery (the exchange of information and evidence between parties – documents, testimony of witnesses and reports of experts), and pre-trial motions to the judge can be made by either party and in cases that survive the pretrial motions, parties file their arguments and proofs before the judge and/or jury, and a decision is rendered. A party or parties unsatisfied with the decision of the trial court can appeal that decision to a higher court to determine whether there were legal or procedural errors. (Cotney, 2019)

Litigation offers several advantages, for example: It ensures adherence to legal standards and procedural rules, providing parties with a structured framework for resolving disputes. Moreover, judges are impartial decision-makers bound by legal precedent and regulations, ensuring fairness and consistency in dispute resolution and the court judgments are legally binding and enforceable, forcing parties to comply with court orders. Another advantage is that litigation outcomes establish legal precedents that assist future cases, contributing to the development of construction law. (Cotney, 2019)

On the other hand, litigation is time-consuming. A case can take even several months or years before resolution, all the while adding up costs. The legal fees and court costs alone huge amounts. In addition to discovery expenses, expert witness fees, trial preparation and related tasks, hence the costs of litigation can be extremely expensive for all involved. Second, the litigation process often further increases conflict between the parties. Litigation pulls the relationship between the parties into conflict, prohibiting them from working together after the litigation process is completed; also, parties lack control of the outcome to a judge or jury whose decision may not be what parties want or expect. (Scalisi, 2022)

In deciding whether or not to litigate, parties weigh costs and benefits against their available alternative dispute resolution mechanisms, timely preservation and documentation of evidence, retention of intelligent and experienced construction attorneys and otherwise improve their chances of success. For all the reasons above clearly given, the parties have been seeking alternatives to litigation in deciding how best to resolve issues through their negotiating and arbitrating the disputes in an efficient and economical manner, and to avoid the expensive time and energy spent in the litigation process. (Scalisi, 2022)

3.4 Arbitration

Arbitration serves as an alternative dispute resolution method enabling parties to conclusively settle their disagreements outside traditional court systems, offering a less formal alternative to litigation with relaxed rules of evidence and procedure, and reaching a binding resolution. The process entails the submission of a dispute to an impartial arbitrator or tribunal, often experts in construction, acting similarly to a court to resolve disputes, with their decision being final, binding, and enforceable by courts. (Bushe, 2015)

The agreement to arbitrate, whether standalone or part of a broader contract, dictates the parties' rights and obligations. Parties typically have the freedom to choose the arbitration venue and procedural rules, often incorporating institutional rules, where Standard Contract forms such as FIDIC for example include a standard contractual clause for the dispute resolution process and how it should be structured.

Arbitration proceedings are usually kept confidential, where the process starts with the initiating party, known as the claimant, bringing forth the dispute against the respondent, who is the subject of the claim, and the arbitrator or panel of arbitrators (often called the tribunal panel), determined by contractual terms or mutual agreement are appointed and preside over the dispute resolution process. (McConnell, 2022)

Typically, these arbitrators possess expertise in the subject matter at hand and have undergone formal arbitration training, with many being legal professionals or retired judges. The method of appointment of the arbitrator/tribunal is usually agreed upon before disputes arise, and arbitration clauses in contracts outline the process sometimes involving third-party providers like the American Arbitration Association (AAA) or the International Chamber of Commerce (ICC). (NASBP, 2017)

After the arbitrators' appointment, a preliminary meeting sets the procedural timetable based on party submissions and the parties are encouraged to agree on this procedure beforehand and a hearing follow, where parties present their cases through their legal representatives.The arbitrators cannot meet privately with parties unless agreed otherwise and they derive their authority from the arbitration agreement and focus on the presented factual and legal issues. They are bound by duties such as fairness, impartiality, sensible procedures, and avoiding unnecessary delays and expenses. The duration of the arbitration process varies based on complexity, discovery requirements, arbitrator availability, and arbitration dates typically determined by the parties and the arbitrator. Once the hearings and proceedings are conducted, and upon reaching a decision the arbitrator or panel issues a final, non-public arbitral award binding on the parties, barring exceptional circumstances. The decision may be a single award addressing all disputes or multiple awards for separate issues and the settlement terms, if agreed upon, may be included in an award for enforcement facilitation. With the parties' consent, arbitrators may issue provisional orders. Arbitral awards hold the same weight as court judgments and are enforceable accordingly. (Bushe, 2015)

Unlike litigation, arbitration awards are rarely subject to appeal, rendering them effectively final decisions. But the appeal process is still in place though rarely are arbitrators' decisions overturned, which requires proof of bias or fraud. While arbitration might have a commonality with litigation – settling legal disputes before a

third-party decision maker – and with the application of legal principles – it is more flexible in its constructed format to better suit particular dispute circumstances; it is especially suited to large-scale construction disputes and has several characteristics. Among these features is its flexibility of process, allowing parties to select rules of arbitration or to craft their process, including whether or not to provide for oral hearings, decision-making on the basis of written submissions only, or options allowing a site visit to inspect potential sources of contamination. This flexibility contrasts with the rigidity of litigation's procedural rules. Moreover, arbitration usually results in a faster decision-making process – the ICC, for instance, has a six-month rule for delivering a final award, in contrast with litigation which might often take much longer. (Ellison Watts, 2020)

Another benefit is the arbitrators who are chosen based upon their technical expertise of the issue in a dispute. Arbitrators can be chosen by parties with the requisite industry expertise. Because it is the dissenting arbitrator who is most likely to have a full appreciation of the complex issues in a construction dispute – as it is composed from a list of previously experienced professionals and retired judges – the use of this particular selection procedure is likely to minimise errors. Despite the filing and arbitrator fees that result from the former, arbitration is a much cheaper process than litigation. Despite this formality, arbitration is less rigid than negotiation or mediation, less expensive than litigation, with limited discovery and simplified rules of evidence. Moreover, arbitration is usually a very private form of dispute resolution, unlike public court proceedings. This fact in itself is an argument for arbitration. This confidentiality give parties a degree of privacy, keeping out commercially sensitive information from the public – and protecting business reputations that are crucial in the construction industry, where reputations can swing business fortunes. (Courtesy Strickland, 2018)

Arbitration is seen as preferable to litigation in construction disputes especially where the dispute is technical. Building on its flexibility, speed, expertise and confidentiality make it an attractive forum for parties; it’s unsurprising that it has become the preferred contractual method of dispute resolution in the construction industry. Thus, arbitration has become the chosen way to resolve conflicts in different construction markets, which indicates its importance and qualifies it as the most efficient way to resolve any construction conflict. (Cotney, 2019)

3.5 Dispute Review Boards (DRBs)

A Dispute Board (also referred to as a DRB, Dispute Review Board) is an on-site, damages limitation and dispute settlement institution, comprising one or three impartial and independent members, appointed by the contracting parties. What differentiates DRBs from other types of ADR is that members are actively involved prior to the emergence of formal disputes. Designated dispute board members are third-party stakeholders selected in recognition of their expert knowledge, judicial impartiality, and contractual independence relevant to the given project. They become functionally fully fledged members of the project management team tasked to resolve issues typically arising throughout the execution of a project and undertaking regular site visits exerting influence over the parties' conduct on a daily basis, as long as the contract is in force. Unlike other methods of ADR, real-time project implementation by DRB members increases their leverage and effectiveness as a dispute resolution tool. (Aceris, 2020)

Unlike litigation, arbitration and (in some countries) mediation, Dispute Review Boards and Adjudication differ in several important aspects. First, an adjudication is normally not formally governed by legislation or common law principles (unlike litigation). Second, it is not typically regulated by governmental authorities (unlike litigation). Third, adjudication rulings are not enforceable automatically (unlike arbitration). Fourth, contrary to arbitration, adjudication is normally not conducted under the safeguards of a specific law or under international instruments. Fifth, a Dispute Review Board or adjudicator is not normally permitted to assist or facilitate the parties' negotiation and settlement of disputes (as in mediation with mediators). If the disputes are not amicably resolved, if one of the parties request a recommendation or decision by the Dispute Review Board or the Adjudicator, its decision is binding until either party agrees or a court holds otherwise. (Cotney, 2019)

High-level organisations such as the ICC, FIDIC, the World Bank, the AAA, CIArb (The Chartered Institute of Arbitrators), DBF (The Dispute Board Federation) have also produced model procedural rules, codes of conduct and standard agreements, establishing a body of model tribal knowledge which disputing parties and dispute board members can adopt as their own, safe in the knowledge that tested and

proven rules are being followed. The rules generally contain an extensive list of stipulations dealing with the establishment and operation of DBs, which includes the method of appointing board members and the type of DB there is; the services it is going to provide and the extent of the rights it is being delegated; its procedures and how it is to be remunerated. (The similarity with arbitration rules is readily apparent upon observation, and has led to a general trend of dispute board procedures being subsumed into what is called ‘mini arbitrations’ (Chapman 1999)

A dispute board can be created either reactively when a dispute erupts (‘ad hoc’), or proactively at the commencement of the project and functioning as a permanent feature (‘standing’). Dispute boards can be grouped into three broad categories:

- a dispute review board (DRB), providing informal guidance and non-binding suggestions;
- a dispute adjudication board (DAB), delivering enforceable decisions; or
- a hybrid board that encompasses the two functions – for example, the FIDIC’s Dispute Adjudication/Avoidance Board (DAAB). (Brown and Martinez, 2021)

These tools were promoted in particular with the introduction of Dispute Adjudication Boards (DABs) in the FIDIC 1999 contract forms. Their use in practice proved hugely variable: in some cases, the parties omitted the DAB contractual clauses altogether; sometimes, the parties did not activate DABs even though the clauses were included in the contract terms; and sometimes they used them to deliver rulings on disputes that had arisen some years previously, in several cases not before referring the dispute on to arbitration or litigation for final determination.

However, later, this practice changed. In its 2017 contract forms, FIDIC introduces a Dispute Avoidance/Adjudication Board (DAAB), departing in one respect from the typical DAB. The DAAB, acting like a permanent dispute board, has the dual function of issuing determinations, the signature function of the DAB, and, more importantly, helping parties to prevent issues from evolving into formal disputes. It can work in this way only if there is a shift in practice, under which it plays the role not simply of an impartial arbitrator issuing a decision, but of an active stakeholder facilitating dispute avoidance and resolution. (Brown & Martinez, 2021)

Thus, the DRB panels themselves are composed early on in the Adjudication process. Adjudication panels are typically composed of three members and the

World Bank and the new FIDIC contract terms recommend this size, but for smaller contracts and where the contract itself is not large, a one-person DRB may be used. For large projects and contracts with many disciplines and sub-contracts, a larger pool from which a one-person, three-person or multi-member panel could be necessary. (Boucly, 2008)

Generally, each party appoints one member, and the third member (as 'third member' and chair of the DRB) is appointed jointly by the parties or by the first two members. It is advisable to include a provision in DRB rules that allows for 'reasonable objections' to the selection of the other party as a matter of course, as is reflected in each of the FIDIC forms. Each party may choose its own member, but once so selected, that member remains free of any obligation to represent the interests of his or her party or otherwise report back to their side. As a matter of policy, DRB members must be seen to act impartially and to act in the interests of both parties. A member who is perceived to be 'biased' against one party will exponentially undermine the credibility of the DRB and the acceptability of any of its decisions.

Hence, it is preferable, where possible, for the parties to participate in the selection process. The parties also may agree upon the chair's identity and allow him to help the parties make the other appointments. The DRB's design is therefore important, since the parties' confidence in the DRB's knowledge – especially that of the head of the DRB – is crucial to the success of the board, who must preside fairly and decisively over the regular meetings and hearings. In the case where the parties proceed on the basis of a neutral chair, it is better for that individual to be selected by the parties than for it to be arbitrarily assigned by a court. (Chapman, 1999)

Once the DRB has been selected, regular site visits become the focus of contact, stopping disputes from evolving into claims. Whether routine site visits are monthly, quarterly or semi-annually depends on the complexity of the project and the presence of special problems. Complex technical projects or those with unknown subsurface conditions demand more attention, perhaps every month. In addition to making site inspections, reviewing work progress and discussing potential problems, the DRB talks with parties, asking questions, fostering discussion and clarifying issues. Dispute hearings at the site may commence after routine visits. Routine progress reports are passed along with a copy of a report-out to the DRB after each visit

suggesting approaches to resolving concerns, working through them and so moving toward a resolution. Because DRB members are not bound by prior findings, they might propose different ways to work through the problem with sufficient recollection of the facts to show respect to all parties. DRB members should remain well-informed about construction progress and become thoroughly familiar with the work from routine progress reports. (Chapman 1999)

Members would have to be on call so that they can meet on short notice to hear testimony and deliberate. DRBs established under contracts between an owner and a general contractor could have rights to ‘decide’ disputes at different levels, and provisions would have to be put in place when retaining those who will do the work on lower tiers i.e. subcontractors.

When a dispute arises, either party, typically the Contractor, initiates an application to the Dispute Review Board (DRB). Hearings are often scheduled within a specific period, and the decision should be announced in a short period such as the 28-day requirement recommended by FIDIC forms as shown below in Fig. 10. Unlike arbitration or court proceedings, DRB hearings are less formal, resembling site meetings. Parties usually submit 'position papers' to the DRB and each other before the hearing, outlining their understanding of the disputed issues and reasons supporting their positions. These papers aim to clarify the issues without turning into confrontational routines. During the hearing, parties outline their positions, possibly agreeing on certain facts, and the DRB may pose initial questions. Witnesses may be called, but cross-examination typically occurs through the DRB. After initial presentations, the DRB adjourns for private discussions before issuing a written decision, emphasizing prompt resolution and decisions for confidence in the process. (Owen, 2003)

DRB proceedings emphasise rapid resolution through simpler, less adversarial hearings than would be found in arbitration or litigation. The parties make their cases through position papers and short hearings. The DRB’s reasoning is set out in a carefully written decision, which is normally issued promptly and, if possible, unanimously because there must be a perception of fairness in the process if the parties are to respect and follow the decision. The views of the different members of the DRB are fully accommodated, but the ideal is that all members should reach unanimity because the use of arbitration might be required where unanimity is

impossible. Decisions are always carefully written so that it is clear which party is succeeding or failing on each point. Both can succeed on the decision.

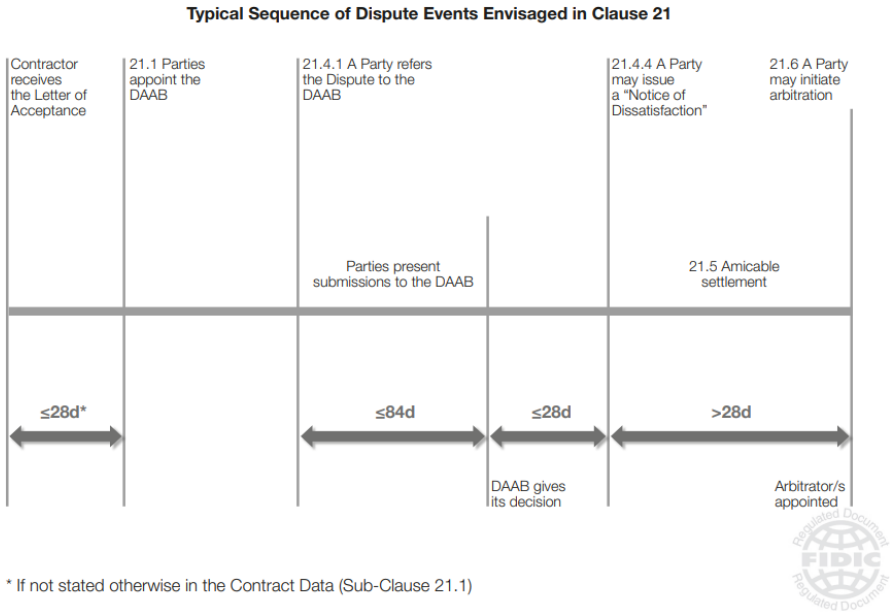

Figure 10: DAAB Process (FIDIC, 2017)

If any party is dissatisfied with a DRB decision, it might try negotiating a settlement notwithstanding the DRB process. Failing this, but presuming that it remained bound by reference to the DRB decision, the dissatisfied party might want to pursue any further alternate options as regards dispute resolution such as arbitration, as the FIDIC clauses and conditions encourage, or even litigation. The FIDIC 1999 conditions of contract stipulate that a DRB decision can be binding on the parties unless there is a specific provision in the contract to the contrary, or unless such a decision has been successfully challenged by means of a judicial review of the DRB process, for example in proving bias or evident procedural errors. With this in mind, it becomes mandatory for any party who wishes to overturn a DRB decision to show some signs of ‘good cause’ (or as we might expect in this context, ‘due cause’), and pursue what the legal processes demand. In order to maximise the efficiency of a DRB, procedures for dispute resolution ought to be easy, equitable and expeditious. Excessive review and negotiation steps before or during the DRB hearing create increased confrontation and decrease the possibility of success. Procedures should dictate quick referral of disputes to the DRB, and abandonment of strict rules of evidence usually followed in other proceedings. All documents relevant to the hearing

should be provided to the DRB and the opposing party earlier in time, in order to avoid the referral delay.

Whenever new evidence emerges during the hearing, a chance of response should be given to both parties – either by a recess or by a written response. The DRB must insist on fairness, being careful not to become a victim of the ambush tactic and to prevent submission of material that is inadmissible or irrelevant to the case, which might confuse the matter. Fairness and expedition have never been balanced fully in the DRB's operation. (Chapman, 1999)

According to the Dispute Resolution Board Foundation (DRBF), 60 percent of projects with a Dispute Board will experience no disputes, and 98 percent of disputes brought before a Board will be resolved without going to litigation or arbitration (LMAA, 2024). The value of Dispute Boards, therefore, lies not just in a quick and direct route to resolution, but also in the reduction of the amount of conflict in the first place, leading to a win-win outcome for all.

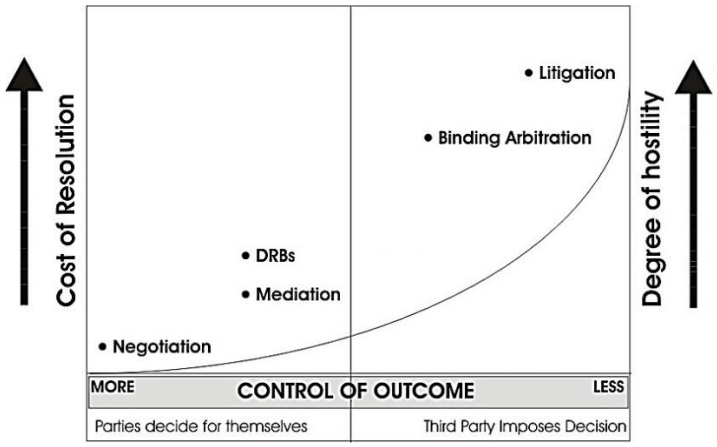

Figure 11: ADR Continuum (Saeb et al., 2018)

4. Egyptian Construction Claims Process Analysis

Egypt follows a civil law system, with its Civil Code No. 131 of 1948 rooted in French civil law but incorporating specific local variations. As per Article 89 of the Civil Code, a contract is formed when an offer is met with a corresponding acceptance from the other party. If the acceptance includes different or additional terms, it is considered a counteroffer, and the contract is established once this counteroffer is accepted without modifications. While a formal written contract is not required to form a construction contract, it serves as important evidence of the existence and terms of the agreement between the parties. Similarly, a signature is not necessary for a contract to be valid.

In the construction industry, a contractor's tender submission is regarded as an offer and any action, whether explicit or implied, that clearly indicates the employer's intention to accept the offer results in the formation of a construction contract. Documents such as a 'letter of intent' or 'letter of award' become contractually binding from the date they are received by the contractor, unless specified otherwise by a condition precedent.

A public contract involves performing specific tasks funded by government resources for the benefit of the community and is called in Egypt an “Administrative Contract”. Private companies and corporations typically adhere to stricter standards when dealing with the government compared to private transactions. Similarly, the government is obligated to treat its contractors fairly and equitably to ensure the successful execution of these projects. On the 3rd of October 2018, the Egyptian public authorities issued law no.182 of 2018, a new Egyptian public procurement law, to regulate projects realized by the public authorities. However, it is not a must that the law governing the contract in such case, where one of the contract parties is a governmental organization, to be the law no.182; as the organization may agree in some cases to enter contracts governed by FIDIC or Civil Law, especially with foreign contractors, to encourage them to bid in the projects, as these types of contracts gives the contractor much more authority than the administrative contracts.

On the other hand, in the private sector, parties have the freedom to agree on various aspects of their contract, including: the governing law; the law applicable to

the arbitration agreement; the location of the arbitration (seat); the arbitral rules to be applied; the selection of arbitrators; and the language used for the contract and the arbitration proceedings. However, any provisions that violate Egyptian public order or morals are unenforceable in Egypt. Additionally, if Egypt is chosen as the seat of arbitration, the selected institutional rules must comply with the mandatory provisions of the Egyptian Arbitration Law (EAL).

Although the agreement on terms of a construction contract in Egypt in the private sector is totally in the control of the parties involved, the commonly used standard contract forms for construction and design include those from the International Federation of Consulting Engineers (FIDIC) and the Egyptian Syndicate for Engineers, which also provides standard forms for design and supervision. Currently, most contractors in the Egyptian market prefer FIDIC contracts due to their flexibility and utility over the standard contracts. FIDIC contracts are available in several types, such as the FIDIC Rainbow series and the White Book. These forms with their different versions are predominantly utilized in the majority of construction and infrastructure projects across Egypt and include specific procedures for contractors to follow when submitting claims.

The most utilized form in the construction projects in Egypt is The Red Book, known as "The Construction Contract," with its different versions, which is also the most widely used FIDIC contract. It is ideal for construction projects whether residential, commercial, or administrative projects, where the employer primarily holds the responsibility for the design. While, the second most utilized form is The Yellow Book, titled "The Plant and Design-Build Contract," which is appropriate for construction projects where the contractor assumes most of the design responsibility. Other forms which are also used include The Silver Book, known as "The EPC/Turnkey Contract," which is designed for turnkey projects, and The Green Book which is suitable for projects with a small capital value.

The following table includes an overview of the explored Literature review showing the main critical topics that are always encountered and how they are handled in the Egyptian market.

Category	Analysis Points
Claim Types	Based on the research on construction claims in the Egyptian market, the most common types encountered are the following: • **Change Orders and Variations:** In Egypt, a frequent issue is a lack of clear communication and documentation surrounding change orders, leading to disputes about what was actually agreed upon and the associated costs. • **Delayed Instructions:** Delayed instructions caused by various factors, including unforeseen site conditions, slow decision-making by the client, or contractor performance issues. Egyptian construction projects often face with delays due to bureaucratic procedures and unclear contract terms regarding responsibility for delays. • **Productivity Losses:** Delays or disruptions can also lead to decreased productivity for the contractor. This results in claims for additional costs incurred due to inefficiencies caused by factors outside the contractor's control. • **Price and Currency Fluctuations:** Rising costs of materials or labour due to inflation and currency devaluation can significantly impact a contractor's budget. Egyptian construction contracts need to clearly address how price fluctuations will be handled, as some may not have provisions for cost adjustments. **Payment Issues:** Late or withheld payments by the client typically cause significant financial strain for contractors. Clear payment terms and mechanisms for resolving disputes over payments are crucial in Egyptian construction contracts.

Category	Analysis Points
Claim Management Process	The claim management process in the Egyptian construction market typically involves several steps, with some variations depending on the specific claim and the contractual agreements. Here's a breakdown of the typical stages found: • **Claim Identification and Notification:** The first step involves identifying a potential claim situation, this could be a delay, additional work due to changes, or a quality issue. Submitting notification of the potential claim to the other party (usually in writing) in the contractual time bar is crucial according to Egyptian regulations. • **Claim Preparation and Documentation:** Once a claim is identified, the contractor needs to gather all relevant documentation to support their case. This might include contracts, change orders, site diaries, photographs, and expert reports. Building a strong case with thorough documentation is essential for successful claims. • **Claim Submission:** After preparation, the claim is submitted by the project's team to the relevant party through the official/contractual means of communication, and through standard forms (if available). • **Claim Negotiation:** Often the preferred approach, negotiation involves both parties attempting to reach a mutually agreeable settlement. This can be facilitated by a mediator or claims consultant. Clear communication and a willingness to compromise are key during this stage. • **Dispute Resolution:** If negotiations fail, more formal dispute resolution mechanisms come into play. These will be further illustrated.

Category	Analysis Points
Processes Issues	Organizations in the Egyptian construction market face several challenges and issues during the claims management process. Here are some of the most typical errors, mistakes, and issues: • Poor Documentation • Untimely Claim Notification. • Inadequate Contract Management. • Communication Gaps. • Fear of Confrontation. • Lack of Expertise. However, this is just a short list which was observed from the available literature, the effect of each issue of these or the further issues that are encountered in the market were difficult to find. Hence the effect of these issues will be measured quantitatively through the study questionnaire.
Dispute Resolution Mechanisms	In the Egyptian construction market, there are several dispute resolution mechanisms available, these are listed as follow: • **Negotiation**: The simplest form of dispute resolution and the one widely used, due to its cost effectiveness This remains a preferred approach in many cases, especially for smaller claims or those where maintaining a good working relationship with the other party is important. Negotiation allows for a more flexible solution and can be faster than more formal methods. However, successful negotiation requires clear communication, willingness to compromise, and a strong understanding of the claim's merits. • **Mediation:** A neutral third-party mediates and ease contacting to assist both parties reach an a mutual agreement and a settlement. This option can be beneficial when negotiation seems difficult but both parties are open to compromise.

Category	Analysis Points
	• **Arbitration:** This is one of the most popular choices for resolving construction claims in Egypt, due to its speed and efficiency, where arbitration is generally faster and less time-consuming. This is crucial for keeping projects on track and minimizing financial strain. In addition, arbitration proceedings are typically confidential, which can be beneficial for both parties who may not want sensitive project details becoming public knowledge, and it is mainly dependent on an independent arbitrator with expertise in construction issues makes a binding decision, offering a neutral and supposedly fair outcome. • **Litigation:** While not the most popular choice due to its time and cost implications, litigation in the Egyptian courts remains an option, particularly for complex claims or when arbitration fails. The best dispute resolution mechanism for a specific claim in Egypt is dependent on various aspects, such as the value and the complexity of the project/claim, where complex claims might be better suited for arbitration due to the arbitrator's expertise, while negotiation might be more cost-effective for smaller claims. Also, the desired speed of resolution plays an important factor on the decision, for example when a quick resolution is crucial, arbitration is usually faster than litigation. Finally, the construction contract might specify the preferred dispute resolution method, and this contractual provision is usually agreed upon before entering the contract.

Table 1: Literature Review Analysis

5. Questionnaire

5.1 Questionnaire Aim

The author conducted a questionnaire to gather information and insights from experienced professionals in the Egyptian construction industry regarding various aspects of the claims management processes, including the timing of notices, particulars required for claims, types of claims encountered, difficulties encountered in the process and dispute resolution mechanisms used in construction contracts. The results will be studied and analysed to lay hands on the current deficiencies and difficulties that the experts encounter in the claim management process, in order to help identifying trends, best practices, and areas for improvement in managing claims effectively within construction contracts and avoiding potential conflicts. A copy of the conducted questionnaire is annexed at the end of this paper.

5.2 Questionnaire Sample & Distribution

The questionnaire targeted experts in the Egyptian construction market, specifically those involved in claims management. Respondents included a broad spectrum of stakeholders such as consultants, contractors, subcontractors, and owners, spanning career levels from engineering to management and upper administration. The study's population sample comprises various stakeholders within the construction industry, including contract engineers, contracts and claims managers, planning engineers, planning managers, delay analysts, contract administrators, procurement engineers, project engineers, and project managers. Participants possess diverse levels of experience from different backgrounds and organizations, which is a critical factor for ensuring accurate results, hence the sample was selected based on their areas of expertise, as claims preparation and practices demand significant technical knowledge, coordination, and communication skills to effectively interact with different project teams, subcontractors, and the counterparties.

The questionnaire was distributed via the author’s LinkedIn profile, and the data collection occurred through the questionnaire's introductory section over roughly one month. Participants were selected using purposive and snowball sampling

techniques, ensuring they were relevant and knowledgeable in the field. Given the unknown population size, the necessary sample size was determined using a calculated margin of error, following the guidelines of Bhardwaj (2019) and Islam (2018). The sufficiency of this sample size will be evaluated in the "Questionnaire Validation" section, with more detailed respondent profiles provided in the forthcoming "Results and Analysis" section.

This questionnaire focuses exclusively on Egypt, as the author aims to provide insights specific to the Egyptian construction market, and the relevance of the study's topic at the national level stems from the varying implementation factors of claims management roles and practices across different countries. Therefore, the author targeted the Egyptian construction sector, distributing the questionnaire to approximately 150 potential respondents in the market using the author's LinkedIn profile and the participants' data was gathered through the first section of the questionnaire and LinkedIn as mentioned.

5.3 Questionnaire Design

The questionnaire was conducted as an online questionnaire to make it easier for respondents to fill up and facilitate the data gathering and questionnaire analysis. The questionnaire was created using mainly structured questions and some unstructured questions to gather a mixture of quantitative and qualitative data, which will help in analysing the results and finding the best practices, suggestions, and improvement potentials. The questionnaire included the following type of questions:

- **Multiple-Choice Questions:** Multiple-choice questions are a type of close-ended question where respondents choose one (single-select) or multiple (multi-select) options from a provided list. These questions include an incomplete stem, close alternatives, and different options of correct answers.
- **Dichotomous Questions:** Dichotomous questions are close-ended and typically require a "yes/no" response. These questions are often used for essential validation purposes and are the simplest form of a questionnaire.
- **Scaling Questions:** Types of questions that use these scales include rank order questions and Likert scale questions.

- **Open-Ended Questions:** Open-ended questions are designed to gather qualitative data, allowing respondents to provide answers in their own words with minimal restrictions. (Bhat, 2024)

The questionnaire was split into nine different sections, where each section focused on a certain topic to gather different type of data and information, in order to consolidate and analyse them to support the aim of the questionnaire and eventually the study. The sections were sort into the following:

Section 1: Personal and demographic information, which allow the researcher to segment the respondents into different groups and knowing the demographic profile of respondents which helps in understanding who is participating in the questionnaire.

Section 2: Organization Information, which provides context for the responses. Understanding the type, size, and composition of an organization helps in interpreting the data more accurately and how different organizational characteristics correlate with specific outcomes, and this shows any biases in the sample to help in analysing responses more accurately and identifying patterns or trends within specific organizations/groups.

Section 3: Claim Identification Process, this section focused on gathering data relating to the issues encountered with claim identification and the awareness of the project team members to the process.

Section 4: Claim Notification Process, this section focused on the issues faced during notifying the relevant parties about claims, the technology and software used to manage the process, and identifying the contractual provisions for claims' notices that are common in the industry and aimed at collecting the sample's understanding to the importance of the notices, their time bars, their contractual provisions, and the components of a notice of claim.

Section 5: The Documentation Process, the section focused on measuring the questionnaire's sample's awareness of the documentation procedures and its importance to the claim process, the systems utilized to manage the documentation, the effectiveness of the current organizations tools and processes in the Egyptian market, the main issues encountered, and the improvements suggested.

Section 6: Claim Preparation Process, this section aimed at realizing the main challenges that Egyptian organizations face during their claim preparation processes, and the lacking resources and expertise in the estimation process. In addition to measuring the questionnaire's sample's understanding of the contractual provisions for claim submission, their opinions regarding the time barring of construction claims, the most challenging components and tasks during claims preparation, the most common type of claims encountered, the utilization of claims management software and their understanding and opinion about the different types of delay analysis techniques and evaluations.

Section 7: Claim Submission, this section focused on identifying the main difficulties encountered by companies in the submission of the claim.

Section 8: Claim Negotiation and Dispute Resolution Mechanisms, which focused on identifying the issues encountered in claims negotiations, the most commonly used methods for Dispute Resolution Mechanisms, and the sample's opinion about the most effective methods from their opinion.

Section 9: Additional Information, the section consisted of some open-ended questions to gather insights, previous experience, and recommendations from the sample, in order to facilitate identifying the possible issues in the whole claim management process and provide suggestions and recommendations for best practices.

5.4 Questionnaire Validity

Validity explains how well the collected data covers the actual area of investigation (Ghauri & Gronhaug, 2005). There are mainly four types of validity for questionnaires, namely; Face validity, Criterion Validity, Content Validity, and Construct Validity. The author performed a sufficiency test on the questionnaire data to determine if the sample size was adequate for representativeness. This test utilized a commonly used statistical method, such as the one established by Cochran (1977), which has been applied in various other construction-related studies (Pereira, 2018). To achieve this, equation (1) below was used to calculate the minimum number of questionnaire respondents needed to draw meaningful conclusions and

ensure valid findings. The computed minimum value was then compared to the total number of questionnaire respondents collected for this study.

$$n = \frac{\mathrm{t}^2 s^2}{e^2}$$

where:

- n is the minimum required number of questionnaire respondents,
- s represents the estimated variance deviation expected from the adopted scale point system, calculated as the fraction of the range of the scale, inclusive of all values, to the number of standard deviations that encompass almost all possible values within the range,
- t is the Z-statistic at a 95% confidence level,
- e is the scale points (5) multiplied by the acceptable error margin.

The author wanted to utilize a 95% confidence level which is widely used and that stands for α = 0.05 (Hewage, 2017), and t should be equal to 1.96. The questionnaire mainly utilized a Likert (5) point scale. Hence, s should be either equal to 5/4 or 5/6. e should have a value of (5x0.05) =0.25.

Based on the above calculations, the minimum number of required questionnaire respondents is 43 respondents which is less than the actual number of respondents to the questionnaire (46). By computing the 46 respondents in the above equation, it can be observed that the sample corresponds to a 4.8% margin of error, which is still an acceptable margin.

5.5 Questionnaire Reliability

Reliability indicates the consistency of the sample of the questionnaire, in another meaning that repeating the same questionnaire multiple times should yield the same results (Odom & Morrow, 2006). The Cronbach's alpha coefficient is used to measure the level of reliability, ranging from 0.0 to 1.0, and it assesses the internal consistency of the results. Acceptable alpha values range from 0.70 to 0.95 (Tavakol & Dennick, 2011).

S/N	Cronbach's alpha, α	Internal consistency
1	$\alpha \geq 0.8$	Excellent
2	$0.8 > \alpha \geq 0.7$	Good
3	$0.7 > \alpha \geq 0.5$	Satisfactory
4	$\alpha < 0.5$	Poor

Figure 12: Internal consistency of Cronbach's Alpha (Gliem, 2003)

In this study, the alpha coefficient will be determined for all matrix questions using a version of JASP software for statistical analysis. In general, the higher the Cronbach's alpha values the higher the indication that all questionnaire respondents have a consistent understanding of the questionnaire questions. In this study, the Cronbach's alpha value was calculated for all the claim process issues and challenges that the respondents encountered in the claim management process.

Unidimensional Reliability

Frequentist Scale Reliability Statistics

Estimate	Cronbach's α
Point estimate	0.944
95% CI lower bound	0.914
95% CI upper bound	0.965

Table 2: Reliability Statistics

Table 2 computed and exported from JASP shows a Cronbach's alpha of α = 0.94, which is a significantly high value, which elaborates that the respondent's answers for the questionnaire is consistent and valid. Hence, the values reckons that the questionnaire is valid and reliable.

5.6 Questionnaire Analysis

The questionnaire analysis will be conducted using the mean and standard deviation of the scale responses where the mean will provide an average value, indicating the central tendency of the responses for each question or variable, this will help in understanding the general perception or opinion of the respondents regarding specific issues or challenges in the construction claims management process.

While the standard deviation will measure the variability or dispersion of the responses around the mean, indicating how consistently the respondents answered each question, a low standard deviation signifies that the responses are closely clustered around the mean, suggesting agreement among the participants. On the other hand, a high standard deviation indicates a wide range of responses, reflecting diverse opinions or interpretations. This statistical analysis will enable a comprehensive understanding of the data, highlighting key trends and variations in the respondents' perspectives. The mean will be calculated by taking the sum of all the numerical values assigned to the responses and dividing it by the total number of responses. In this questionnaire, each response option is assigned a numerical value as follows:

- Strongly Disagree = 1
- Disagree = 2
- Neutral = 3
- Agree = 4
- Strongly Agree = 5

$$Mean = \frac{\text{Sum of Values}}{Number\ of\ Respondents}$$

This equation will be repeated for each question in the questionnaire to determine the average response and gain insights into the general tendencies and perspectives of the respondents.

5.7 Questionnaire Results

5.7.1 Demographics

The questionnaire received responses from 46 individuals with varying levels of experience. As shown in Fig. 13, the largest group of respondents had 5-10 years of experience with 47.8% (n=22). This was followed by individuals with more than 10 years of experience at 45.7% (n=21), followed by individuals who has 1-5 years of experience at 6.5%.

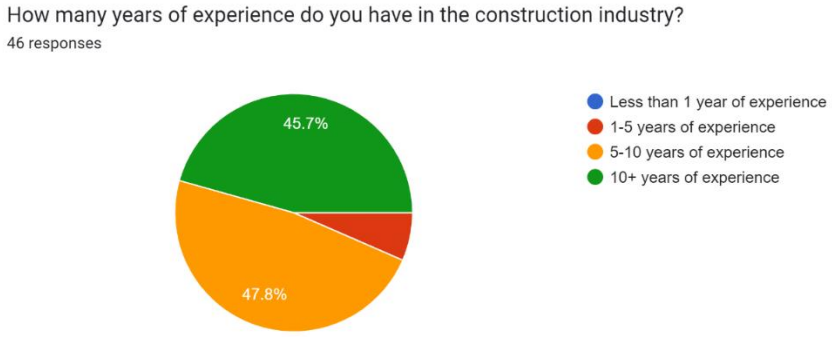

Figure 13: Respondents' Experience

These individuals consisted of Contracts Managers, Claims Managers, Planning Managers, Project Managers, Contracts and Claims Engineers, and Planning engineers who engage/should engage regularly in the claims management processes, as illustrated in the following Fig. 14.

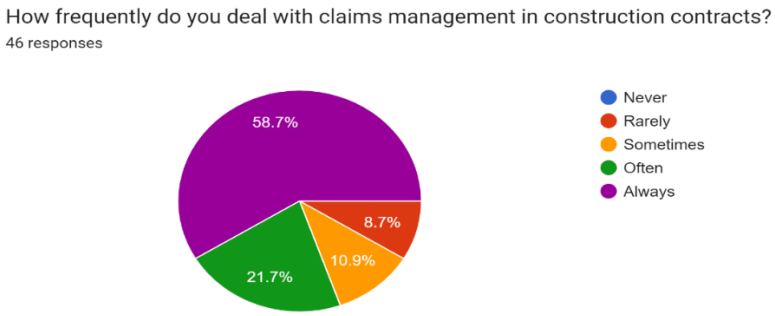

Figure 14: Respondents' Claims Engagement

5.7.2 Organization Information

Regarding the company size of the questionnaire participants, Fig. 15 shows that the majority, 60.9%, are employed in large companies. The second largest portion is at 26.1 percentage (n=12) work in relatively large companies with a total number of employees ranging from 250 to 1000. The remaining individuals are working in relatively small companies. Recognizing that company size significantly impacts the claim process and the organization system, the author targeted the questionnaire towards different companies, with a focus on large companies, to gain a clear picture on the level of understanding of the process.

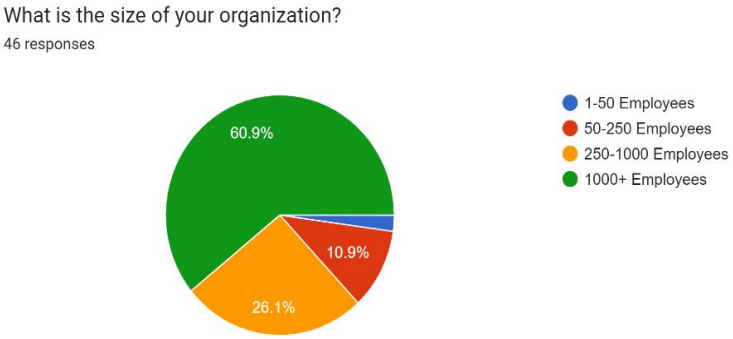

Figure 15: Organizations‘ Size

The author tried to diversify the organizations' roles in the construction industry in Egypt, to observe how the processes are implemented in each type of organization and how this affects the system and utilization of tools and software, however mostly construction claims are associated with contractors, the larger portion of the respondents were working in contracting companies with 56.5%, followed by Owners/Developers at 21.7%, Project Management Firms at 15.2%, followed by other various types of entities.

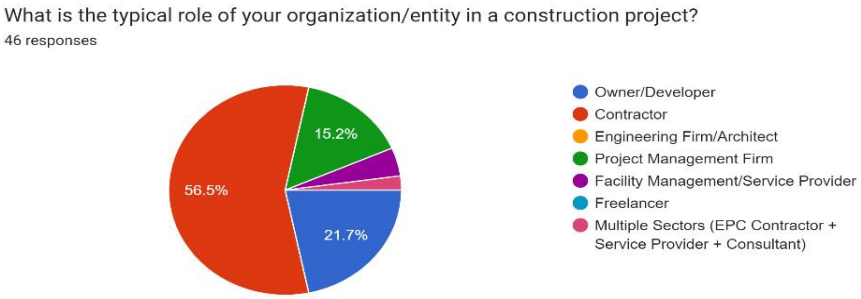

Figure 16: Organizations' Roles

5.7.3 Claim Identification Process

This section focused on the claim identification process in the organizations of the respondents and identified the real challenges encountered by the claims and project's teams in identifying claims and measured the awareness of the projects' teams in such cases.

Based on Fig. 17 below, approximately 52.2 % (n=24) have responded that they encounter issues in the claim identification process either "Always" or "Often". Moreover, 34.8% (n=16) have responded with "Sometimes". These percentages are

considered to be significantly high and illustrates that there is a real issue with the claim identification in the Egyptian Market, and thus is worth researching about, the author was able to get more insights about some of the reasons that may justify these major issues in the following questions.

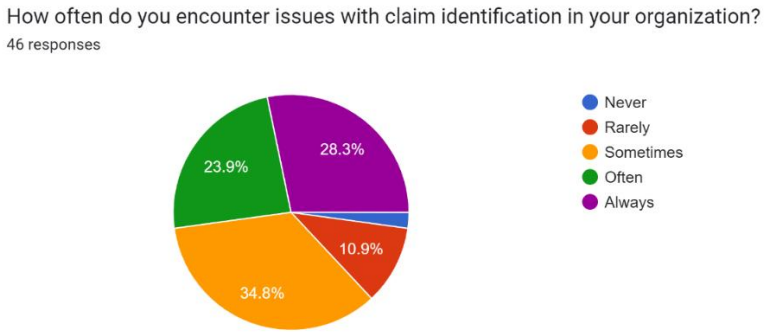

Figure 17: Claim Identification Issues Frequency

The author asked the respondents to rate the awareness of the project team members towards the claim identification process, and the major portion of the answers were “Neutral” with 47.8% (n=22). This basically indicates that there is likely a need for further investigation as it reflects that the organizations may not be placing a strong emphasis on ensuring that all team members are aware of their roles and responsibilities related to the claim identification process, whereas this might point to a need for enhanced efforts to improve awareness through better communication, training, or clarification of roles and responsibilities in the claim identification process within the organization.

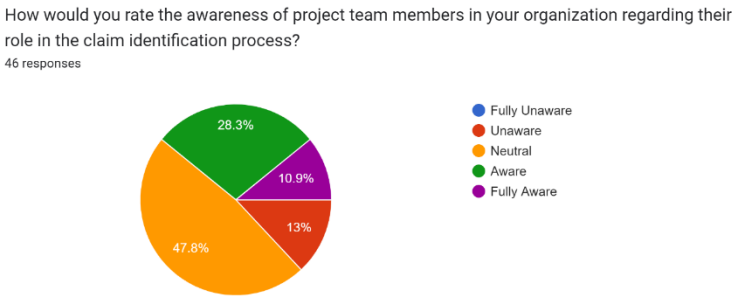

Figure 18: Claim Notification Awareness

The author then listed different issues and factors that might affect the claim identification process in the organization and asked the respondents to rate their relativity to their experience:

1) Inefficient site management: The majority of respondents (n=32) were on the higher side of the scale of “Agree” and “Strongly Agree”, which shows that there is a consensus that this could be an effective factor and the inefficiency of site management indeed affects the claim identification process.
2) Site/Claims team’s high workload: This factor had mainly a neutral scale with 19 respondents having a neutral answer for it, which illustrates that it is not a driving factor in this case.
3) Unclear roles/procedures for the claim identification project: The scale is mainly biased to the agreeing side, where 17 respondents responded with “Agree” and 14 respondents responded with “Strongly Agree”, showing the impact of the unclear roles and procedures in organizations which would need to be clarified and systemized for the employees.
4) Poor communication between site teams and claims teams: This issue had the highest portion of “Strongly Agree” response with 21 responses, in addition to 18 responses of “Agree”. This is nearly 85% of respondents agreeing that the poor communication between the site and claims teams is a major aspect which could result in lack of identification of many claims and mainly affecting the whole process.
5) Lack of awareness from site staff to send a contractual notice: Nearly 75% (n=35 between “Agree” and “Strongly Agree”) had also agreed that there is a lack of awareness from the site staff to send a contractual notice which leads to inefficiencies in claims identification and tracking.
6) Inadequate documentation of events: The scale is also biased towards the agreeing side with 43.4% (n=20) responding with “Strongly Agree” and 34.7% (n=16) responding with "Agree”. Illustrating that the documentation of events in the Egyptian market and especially in the initial phases of the events is lacking.
7) Lack of expertise from site staff in contractual matters: The scale is divided closely among “Neutral”, “Agree”, and “Strongly Agree” with 15, 13, and 14 respondents respectively.
8) Inaccessibility of documents to identify claims: The scale is normally distributed with a peak at “Neutral” with 19 respondents.

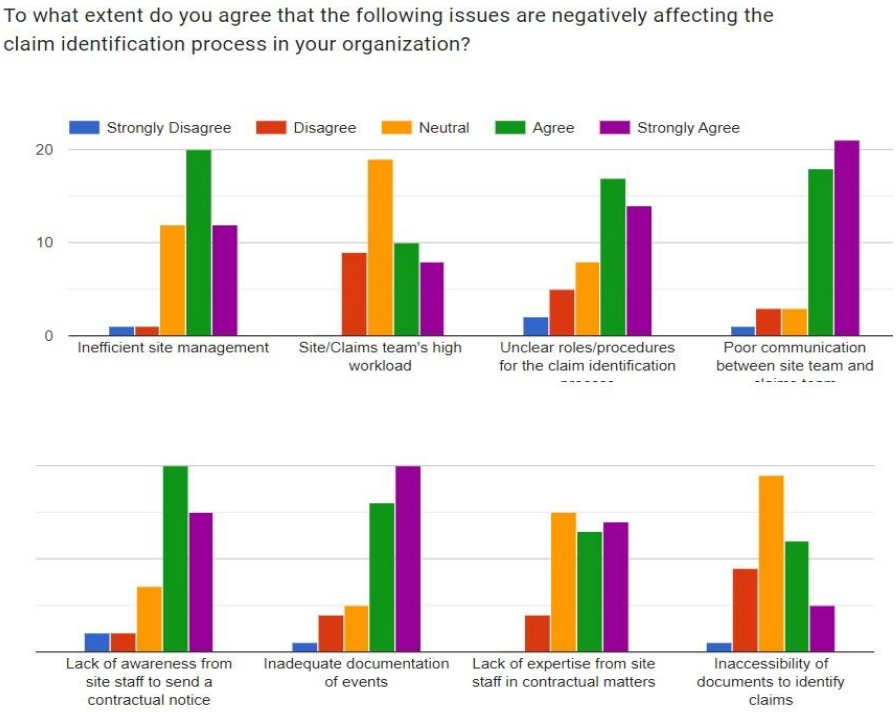

Figure 19: Claim Identification Process Factors

The author used JASP to rank the issues based on the respondent's answers by calculating the mean of each individual scale as mentioned above. The most common issue that negatively affect the claim identification process in the Egyptian market, based on the questionnaire, is the poor communication between the site team and the claims team with a mean of (4.24), this illustrates that there is a wide gap between the site team and the claiming team in the industry in Egypt, and this needs further research to put hands on the root cause of the problem and explore the different ways that we can implement to enhance the communication between the different teams. The second issue in the ranking is the inadequacy of the documentation of the events with a mean of (4.14), which could be a serious issue, and this might be further studied in the claim documentation process section. The next two issues in the list is the lack of expertise from the site staff in contractual matters, and the lack of awareness from site staff to send a contractual notice with arithmetic means of (4.05) and (4.02) respectively, this could be resolved by implementing training programs, workshops, on job trainings, and by developing clear deadlines to understand and raise awareness regarding the claim identification process. The next issues were inefficient site management, unclear roles/procedures for claim identification process, Site/Claims team's high workload, and inaccessibility

of documents to identify claims, in order, all with an arithmetic mean of (4.0) and less. The whole list is shown in Table 3 below.

Claim Identification Process

	Mean	Std. Dv.
Poor communication between site team and claims team	4.244	1.019
Inadequate documentation of events	4.146	1.038
Lack of expertise from site staff in contractual matters	4.049	1.048
Lack of awareness from site staff to send a contractual notice	4.024	1.060
Inefficient Site Management	4.000	0.837
Unclear roles/procedures for claim identification process	3.976	1.037
Site/Claims team's high workload	3.463	0.977
Inaccessibility of documents to identify claims	3.220	1.084

Table 3: Claim Identification Process Issues

Another interesting insight that was observed by the author is that the claim identification issues were found to be more significant with higher percentages in larger organizations (1000+ employees), than in small organizations (organizations with less than 1000 employees). This could be mainly because large organizations often have complex and hierarchical structures, leading to communication barriers and delays in identifying and reporting claims, this complexity can result in fragmented information and a lack of coordination among departments. In addition, large entities will often employ different systems and processes across divisions or regions, creating inconsistencies in claim identification, documentation, and processing – but with more resources, these resources gets distributed across hundreds of projects and initiatives – so it gets harder to ensure claim identification gets the attention it needs, and large organizations' formal decision-making processes can also be slower to identify claims, allow them to be explored, and authorise adjustments.

Furthermore, organizational politics and a blame-avoidance culture can prevent employees from making claims early on, and in larger organizations this culture is more likely to hinder timely identification and notification. There are all complicated and large organizations, so the whole scale and scope of these organizations adds another layer to the problem of claim identification which makes it larger than it would be for smaller organizations.

5.7.4 Claim Notification Process

In this section the author focused on identifying the main issues related to the notification of claims in the construction in the Egyptian market, in addition to the frequency of facing delays in notifying the relevant parties and the adequate contractual time bar to send notices for potential claims after the event giving rise to the claim.

Firstly, the author asked the respondents about their experience in facing delays in the notification process, based on Fig. 20 below, the majority of the sample answered the question with “Sometimes” with 43.5% of the sample (n=20), the next portion was 34.8% (n=16) answering “Often”, this illustrates that delays in notices in the Egyptian market is typical and that needs attention to find the key reasons and try to resolve them, as the notification of claim is a critical step in the whole process as it is the initial part of reserving the party‘s rights and ensuring the claim can be pursued. Where in so many cases the non-compliance with the contractual obligation of sending the notice in the timely manner, would lead to the loss of the claimant’s rights. Timely notifications also play a crucial role in documentation and evidence preservation, providing a documented record of the issue and helping to substantiate the claim with preserved evidence such as site conditions and communications.

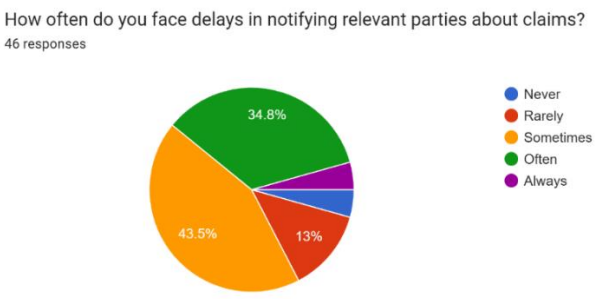

Figure 20: Notification Delays' Frequency

The second question was measuring the awareness of the projects' team members regarding their role in the claim notification process, 52.2% (n=24) believes that the awareness level among the projects' team is "Neutral", and 34.8% (n=16) have responded with "Aware", which could be considered a positive feedback as the awareness is the first step in realizing the importance of the whole process. "Unaware" and "Fully Aware" had the same number of answers with 3 responses for each, as shown in Fig. 21 below.

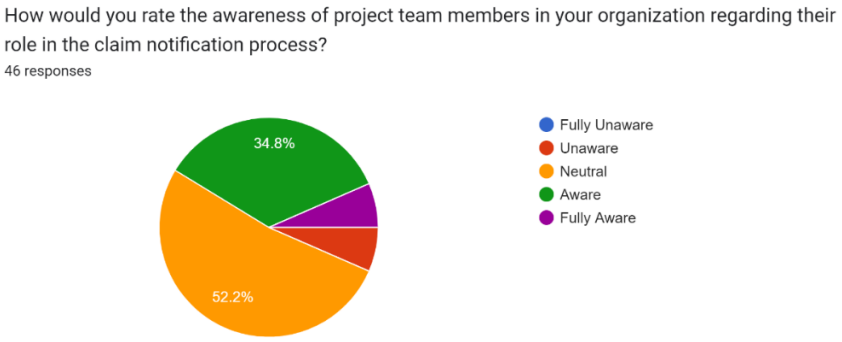

Figure 21: Claim Notification Awareness

The following question the author collected the software used by each respondent to manage the claim notification process, in order to measure the advancement of the technology in the Egyptian market and their awareness of the new modern techniques in the industry. The major portion of the questionnaire with 34.8 % (n=16) still used Email and communication tools as a method of managing notifications, which could be a bit outdated and unreliable. In addition, 9 respondents (19.6%) have stated that their organization does not use any system for managing the process, which could be considered a high percentage and a critical issue that needs awareness.

The author found out that most of these respondents worked in a Contracting company, showing that the awareness and the importance of using these software are still not spread among contractors in the Egyptian market, dictating a strong urge to spread the culture of using such tools to enhance the process. Not using any software to manage the claim notification process can lead to several significant issues, including inefficiencies, inaccuracies, and increased risks, as manual entry and tracking of notifications are prone to human errors, such as incorrect data entry,

missed deadlines, and misfiled documents, resulting in inconsistent documentation which will be further studied. These manual processes are also time-consuming, leading to slow response times and delays in the notification and resolution of claims. Additionally, the lack of centralized information and inefficient communication channels can cause miscommunication and poor coordination among stakeholders, which relates to the poor communication between teams as previously proven in the former section regarding the claim identification process.

The rest of the respondents mentioned that they used a Document Management System, a project management software, and a specialized claims management software with 28.3%, 15.2%, and 2.2%, respectively. These respondents mostly worked for Project management firms or owners/developers. This is still a decent portion, showing that the client sided firms in Egypt are beginning to adopt the new technologies in the world and to understand the importance of these software and systems in facilitating the whole management process, however, this culture still needs to be spread to the contracting companies.

Figure 22: Claim Notification Software

After the respondents emphasized the importance of using software and systems in tracking claims and the whole process, the author inquired about their position on the usage of these software and how it facilitates the whole project and claims management process. The results were significantly in the favour of using such systems, where 54.3% (n=25) of the respondents answered with “Agree” and 41.3% (n=19) answered with “Strongly Agree”, this only proves the importance of the implementation of these technologies and the ease they would produce for the system, the teams, and the whole organization.

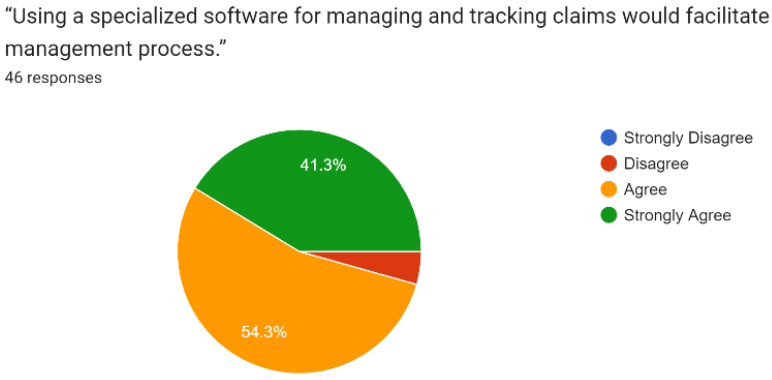

Figure 23: Using software for tracking claims

In the next matrix question the author listed the most typical issues that are encountered in the construction industry regarding the claim notification process and requested the respondents to rate their agreement with the effect of these issues on their work in the claims management, the results were as follows:

1) Contractual time bar for notification is inadequate: the responses of the sample has nearly taken the shape of a normal distribution curve with 15 respondents answering "Neutral", 14 and 12 respondents answering "Agree" and "Disagree" respectively, 4 respondents strongly agreed that the time bar is inadequate, and 1 respondent strongly disagreed. The author also observed that the disagreeing side was mainly concluded by project manager firms and owner/developers' organizations, which shows that there might be a conflict between both parties regarding this issue and contractors use it as an excuse for delays in notifications. Another interesting part is that most of the experienced individuals (10+ years of experience) were either on the disagreeing side, or neutral about this issue, which illustrates that this might be an issue that only younger professionals suffer from and would need enhancement as it gets better with professional experience.
2) Inaccessibility of supporting documents: Exactly fifty percent of the portion has answered "Agree" with 23 respondents, while 9 and 6 respondents were "Neutral" and "Strongly Agree" respectively, which indicates an alert in the accessibility of the documents in the market.

3) Unclear roles/procedures for the claim notification process: The responses demonstrated a beta distribution bell curve leaning towards the agreeing side, with 18 respondents agreeing with the significance of the issue, which might need to be raised. However, most of the disagreeing respondents were experts with more than 10+ years of experience, demonstrating that as you gain experience, you fully recognize your roles and the required procedures for the claim notification process. This mandates organizations to raise awareness to the younger professionals who seem to suffer from this issue.
4) Poor communication between site team and claims team: Once again the scale is leaning towards the agreeing side with the majority (nearly 80%) of the responses. Where 22 and 15 respondents respectively have agreed and strongly agreed that poor communication is negatively affecting the process. The agreeing side is again significantly high in the larger organizations with 1000+ employees, emphasizing on the problematic issues that are encountered in large organizations regarding the communication, which needs to be addressed.
5) Lack of standard form for notifications: The answers were uniformly distributed without a major deviation, where 13 respondents answered “Neutral”, other 13 answered “Agreed”, and 12 respondents with “Disagree”. In addition 4 respondents strongly disagreed that this is a factor affecting the process and just one respondent strongly agreed.
6) Team’s high workload: the highest answer was “Neutral” with 18 respondents, followed by “Disagree”, “Agree”, and “Strongly Agree” with 12, 12, and 4 respondents respectively. The 4 respondents worked for organizations with 1000+ employees which might justify their bias for this issue as they get a higher workload.
7) Inadequate understanding of notification requirements: Nearly 40% of respondents (n=19) agreed that the team might have difficulties in understanding the notification requirements which affects the process.

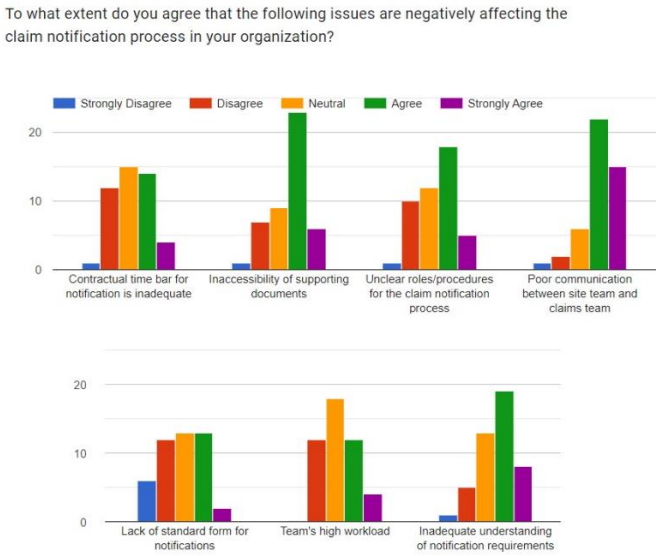

Figure 24: Claim Notification Issues

After using JASP to interpret the results of the questionnaire, the author calculated the mean and the standard deviation of each factor and listed them in table 4 below. The highest mean score (4.27) indicates that poor communication between the site team and claims team is perceived as the most significant issue affecting the claim notification process, and the relatively low standard deviation (0.95) suggests that this perception is consistent among respondents. This is consistent with the previous section of the questionnaire where the poor communication was also the major issue in the identification process. Hence, it is worth highlighting that the communication aspect needs to be enhanced in the Egyptian market. Moreover, the author observed that this issue had a distinctive inclination towards the agreeing side in the larger organizations with 1000+ employees, and especially in contractors organizations. This interestingly shows that the poor communication is usually a more critical issue in larger organizations, this could be due to the large hierarchy and the multiple communication lines, which should be adequately handled once the organization gets larger.

The inadequate understanding of notification requirements had the second highest mean with (3.9) indicating that many respondents find this to be a significant challenge as well. The understanding of the notification requirements can be addressed through training sessions which would enhance the overall process.

The issues of contractual time bar for notification being inadequate with mean score (3.56), the unclear roles/procedures for the claim notification process with a mean of

(3.54), and inaccessibility of supporting documents with a mean of (3.51) also have relatively high mean scores, highlighting them as notable concerns that might be worth noting. Whereas the Team's high workload (mean = 3.34) and the lack of a standard form for notifications (mean = 2.93) are also identified as issues but are perceived as slightly less significant compared to other factors. The higher standard deviation for the lack of standard form (1.1) suggests that opinions on this issue vary widely among respondents.

Claim Notification Process

	Mean	Std. Dv.
Poor communication between site team and claims team	4.268	0.949
Inadequate understanding of notification requirements	3.902	0.970
Contractual time bar for notification is inadequate	3.561	0.923
Unclear roles/procedures for the claim notification process	3.537	1.075
Inaccessibility of supporting documents	3.512	1.098
Team's High Workload	3.341	1.015
Lack of standard form for notifications	2.927	1.104

Table 4: Claim Notification Process

As the inadequate contractual time bars were one of the expected issues that could affect the notification process in the Egyptian market, and has been indeed proved to be a critical issue with a mean of (3.56), the author also asked the respondents about the what could be considered an adequate contractual time bar to send notices for potential claims after the event giving rise to the claim from their experience. Exactly 50% of the respondents (n=23) have responded that 28 Days is a sufficient time bar for contractual notices as shown in Fig. 25 below, whereas this duration also aligns with the FIDIC contract standards. Hence, a 28-day contractual time bar for notifications is advised for the construction contracts in Egypt, and a shorter duration might be a bit problematic and might increase the risk of contractual conflicts in the project.

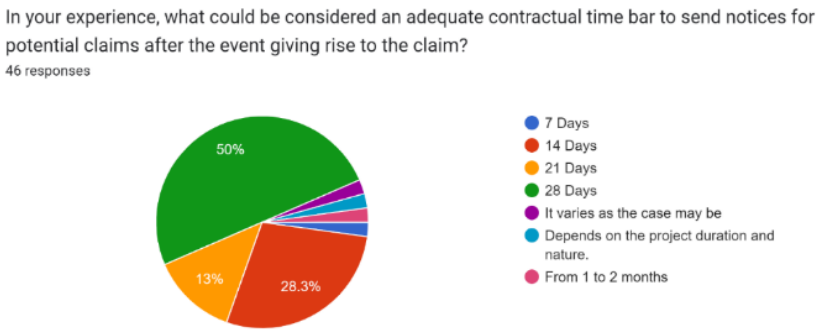

Figure 25: Notices Contractual Time Bar

The author also asked the respondents about their opinion for sufficient information that should be included in the initial notice of claim to preserve the claimant's rights under the contract. This question mainly wanted to test how the notification process works in the Egyptian market and how this complies with the international standards. Whereas a huge majority of 91.3% agreed that the initial notice should at least contain the description of the event or the issue that occurred to preserve their rights under the contract, with a total of 42 out of the 46 respondents. Also, more than half of respondents, with 56.5%, added that the basis of the claim should also be included in the notice for claim to save the party's rights. Therefore, it is always advisable when working in the Egyptian construction industry to at least include these two aspects, which are the description of the event or the issue, and the contractual basis of your claim, in your initial notice; in order to avoid any future conflicts and contractually save your rights to claim the consequences of any suffered delays or incurred costs.

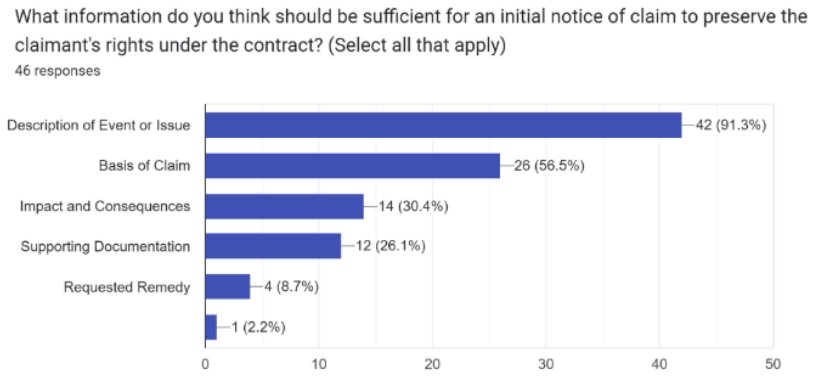

Figure 26: Notice requirements

5.7.5 Documentation Process

In the fifth section of the questionnaire, the author focused on the documentation process in the construction projects in Egypt, including the tools and systems used, the awareness of the project team members, the challenges encountered in the project documentation process, the effectiveness of the processes in the different organizations, and the required measures for improving and enhancing the documentation processes.

In the first question in this section, the author asked the respondents about the frequency of encountering challenges in the project documentation process in their organization. The highest number of respondents (n=20), with a percentage of 43.5 responded with “Often”, and the next highest answer was “Sometimes” with a percentage of 39.1% (n=18), while 2 responded with “Always”. However, the interesting fact is that the majority of respondents who responded with “Often” had less than 10 years of experience, in addition to the 2 respondents with “Always”, illustrating that the documentation challenges are mostly encountered by young professionals who are not experienced enough yet to handle the documentation process. This demonstrates that the documentation process in the Egyptian market is facing issues which could affect the whole management of the project, influencing its schedule, costs, quality, performance, and realization. The issue could be handled by training the young professionals on the different documentation tools and techniques and hiring more experienced individuals to manage documentation in order to reduce the severity of the issue.

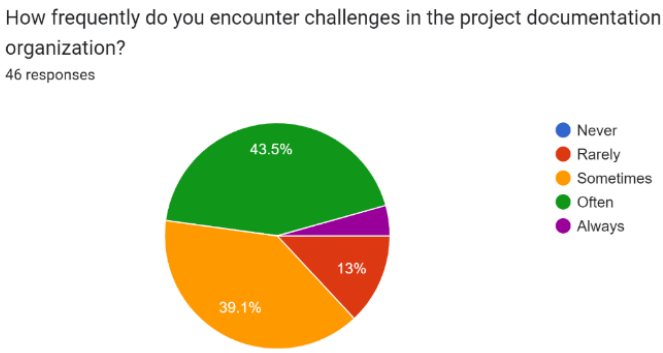

Figure 27: Documentation challenges frequency

The author then asked the sample to rate the awareness of the project team members regarding the importance of proper documentation. “Aware” and “Neutral” had the same percentage of 39.1%, each with 18 responses. This can be considered to be a decent portion which indicates that the documentation issues in the projects is not a matter of awareness, where the projects’ teams seem to be aware of the importance of the process and its implications, but rather it is a matter of implementation and execution. The root issues should be identified and find different means to resolve the issue. Moreover, “Unaware”, “Fully Aware”, and “Fully Unaware” came next with 5, 4, and 1 response respectively as shown in Fig. 28 below.

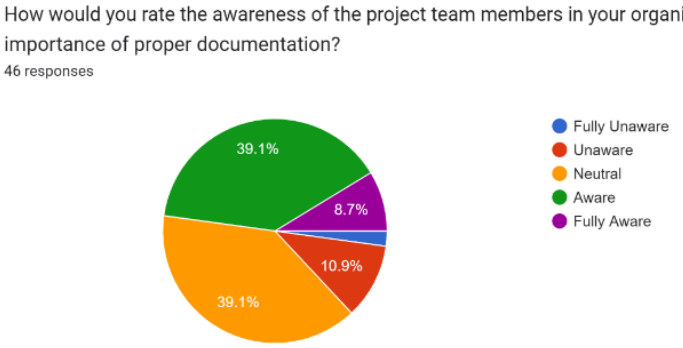

Figure 28: Documentation process awareness

The next question addressed the tools and systems used by different organizations to manage the documentation process. Most respondents used document management systems with a 54.3%, (n=25), this portion could be considered to be a reasonable percentage, showing that the utilization of technologies and systematic processes started to take part in the Egyptian market and this is a good sign on the progress of such issues. However, the next two portions were using “Paper-based filing systems” and “Spreadsheets” with 19.6% (n=9), and 13% (n=6) percentages respectively as shown in Fig. 29 below. This illustrates that there are still organizations that depends on traditional and outdated techniques to store their documents and this could significantly affect the efficiency, accuracy, and overall management performance. These methods are highly inefficient and time-consuming, requiring significant manual effort for data entry, filing, and retrieval. Locating specific documents can be slow and time-consuming, especially as the

volume of documents grows. The risk of human error is also substantial, with manual data entry leading to frequent mistakes, such as typos and miscalculations.

Inconsistencies in spreadsheet formats further complicate data interpretation, where accessibility and collaboration are also hindered as paper documents are tied to physical locations, making them inaccessible to remote team members and difficult for multiple users to work on simultaneously without risking version control issues.

In addition, Security and loss risks increases, as paper documents are vulnerable to physical damage or loss, and spreadsheets may lack robust security features, making sensitive information susceptible to unauthorized access. Additionally, paper-based systems and spreadsheets lack automated tracking and reporting capabilities, making it difficult to monitor document status and generate reports efficiently. The process of manually compiling data from multiple spreadsheets for analysis is both labour-intensive and error prone. Transitioning to digital document management systems can address these issues by improving efficiency, accuracy, accessibility, and security, while also reducing the environmental footprint.

Figure 29: Documentation tools

In the following matrix question, the author listed the most common issues that are faced during the documentation process, and requested the respondents to rate to what extent they agree on the negative effect of each of the issues. The responses captured in Fig. 30 below, were as follows:

1) Lack of digitalized systems: 17 respondents agreed that that this issue affects the whole process, while 11 responses were “Strongly Agree”, this huge portion proves the findings of the last question, where it is essential to digitalize the process and evade the manual data entry techniques. Furthermore, 10 respondents were “Neutral”, and “Disagree” and “Strongly

Disagree” got 6 and 2 responses respectively, noting that all the disagreeing responses were from individuals working in large organizations with 1000+ employees, illustrating that larger organizations tend to digitalize documentation to facilitate the process, and proves the necessity for such process, especially when the organization and the data gets huger, and more difficult to track and control.

2) Inaccurate recorded data: The results has taken a beta bell shaped distribution, shifted to the agreeing side, where “Agree” got the most responses with 18 answers, followed by “Strongly Agree” with 13 Answers. 10 respondents were “Neutral”, and the rest disagreed with 4 responses “Disagree” and 1 “Strongly Disagree” response.
3) Ineffective recording techniques: The most two answers were between “Agree” and “Neutral”, with 19 and 17 responses respectively, while 6 responses were “Strongly Agree” and 4 “Disagree”.
4) Lack of documenting verbal instructions: More than 85% of the sample agreed on the effect of this issue, with 22 responses on “Strongly Agree” and 18 “Agree”. This percentage is an obvious red flag that there is a critical issue in the documentation of verbal instructions in the Egyptian market that needs more attention.
5) Inaccessibility of documents: The highest response was “Neutral” with 19 responses, followed by 15 answers “Agree”, “Strongly Agree” and “Disagree” got the same number of responses with 5 each. And lastly 2 respondents responded with “Disagree”. The author observed that the agreeing side was the dominant size for the younger professionals with less than 10 years of experience, showing that this issue usually needs to be adapted by experts and this is consistent with the first question in the section regarding the frequency of encountering documentation issues.
6) Lack of standard forms to record construction data: 19 respondents of the sample responded with “Agree”, while 13 were “Neutral” the rest of the sample’s answers were close with 6 “Disagree” responses, and 4 responses for each of “Strongly Agree” and “Strongly Disagree”.

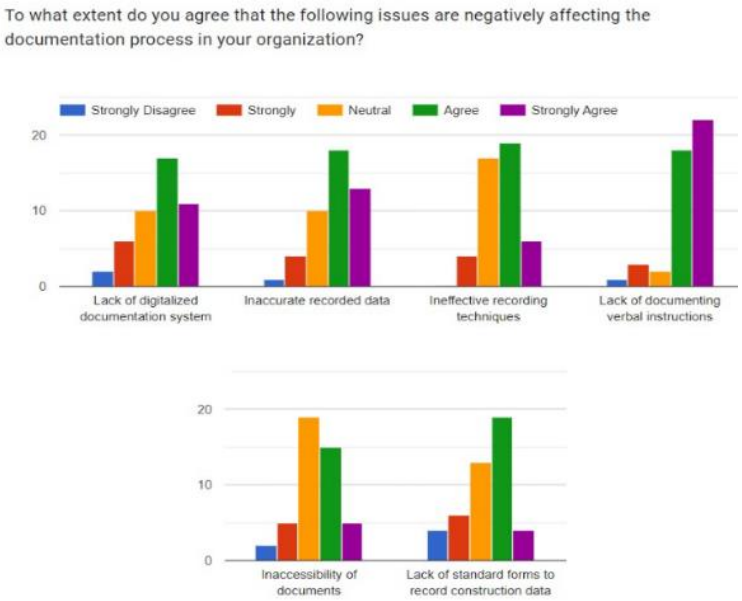

Figure 30: Documentation Process Issues

After exporting the results and analysing them using JASP, the top issue on the list was lack of documenting verbal instructions with the highest mean of (4.34), the relatively low standard deviation (0.88) also suggests a strong consensus among respondents about this problem's severity. This indicates that the lack of documenting verbal instructions is one of the most significant issues in the documentation process in the Egyptian market. The lack of documenting verbal instructions in construction projects leads to significant issues impacting efficiency, accuracy, and accountability. Verbal instructions are often misheard or misinterpreted, causing confusion and resulting in unclear directives and incomplete task execution.

Without documentation, accountability becomes problematic as there is no record of who gave the instruction or what was communicated, making it difficult to resolve disputes and prevent conflicts among stakeholders. This lack of written evidence also leads to inconsistent implementation, as team members may interpret verbal instructions differently, resulting in variations in work quality and non-standardized procedures, in addition to errors and omissions, necessitating rework and causing project delays.

From a legal and contractual standpoint, verbal instructions are often not recognized, leading to non-compliance with contract terms and weakening the position in claims and disputes. The overall project quality suffers as verbal instructions lack the

precision needed for effective quality control, and tracking progress becomes challenging without written records. Implementing documentation practices for verbal instructions is essential, is essential to mitigate these problems and maintain project integrity and efficiency, this could be done by using standard forms such as a Confirmation of Verbal Instructions (CVI), which are widely used in projects, in addition to applying the FIDIC provisions which dictates the contractor to send a notice to confirm any verbal instruction, and in case the other party does not respond to such notice within a certain period (typically 48 hours), the verbal instructions are deemed to be confirmed. (FIDIC, 2017).

The second highest mean (3.83) relates to inaccurate recorded data, highlighting that many respondents consider this a major issue, with a standard deviation of 1.138 indicating some variability in the responses. This could be resolved by raising some awareness regarding the importance of focusing on the accuracy in recording data as this data could be used at any time to preserve the organization's rights and enhance the performance/status of the whole project.

Ineffective recording techniques followed closely with a mean of (3.73) and a lower standard deviation of (0.77), showing that this issue is also significant but with more consistent agreement among respondents. This issue could be addressed through introducing new effective and efficient techniques and/or technologies to the documentation process among different organizations and implementing training sessions to educate the individuals on the means of utilization of such techniques to improve the process.

The lack of a digitalized documentation system has a mean of (3.63) and a higher standard deviation of (1.2), suggesting that while it is a notable issue, but opinions vary widely on its impact, and as previously mentioned that reckons on the results from the last question indicating the importance of digitalizing the process and getting rid of the manual techniques. Inaccessibility of documents with a mean of (3.42) and a standard deviation of (0.97) and the lack of standard forms to record construction data with a mean of (3.17) and a standard deviation of (1.16) are also identified as problems but are perceived as slightly less critical compared to the other factors, whereas the higher standard deviation for the lack of standard forms indicates diverse opinions on this issue, hence it is not that essential to implement.

Documentation Process Issues

	Mean	Std. Dv.
Lack of documenting verbal instructions	4.341	0.883
Inaccurate recorded data	3.829	1.138
Ineffective recording techniques	3.732	0.775
Lack of digitalized documentation system	3.634	1.199
Inaccessibility of documents	3.415	0.974
Lack of standard forms to record construction data	3.171	1.160

Table 5: Documentation Process Issues

In the final question in this section, the author wanted to collect the respondents' insights regarding the improvements that could be introduced to the documentation process in the Egyptian market in order to enhance the process and minimize the faulty procedures.

Thirty two respondents with a percentage of 69.6% (n=32), have suggested raising the team awareness towards the importance of documentation and its role in the claim management procedures and the whole project management scope. The second highest suggestion was related to improving the communication channels with 54.3% (n=25), whereas as proven in the previous sections, the industry is suffering from a critical condition regarding communication. Hence, improving the communication channels will definitely enhance the whole performance of the organization.

The next on the list was standardized procedures with 52.2% (n=24), where standardized procedures with identified and clear guidelines, would facilitate for the different projects' teams the whole process of the documentation and ease the communication between the teams and each other's. This standardization is essential for every organization by all means as it also facilitates cross functional understanding of the system as a whole.

“Better documentation practices” was chosen by 22 of the respondents with a percentage of 47.8%, and as discussed before introducing modern tools and techniques to the process would facilitate the work for the team and save a lot of time, effort, and cost, affecting the performance of the whole project, and facilitating the data analysis , the recovery of information, and the formation of reports and dashboards to document the project’s status.

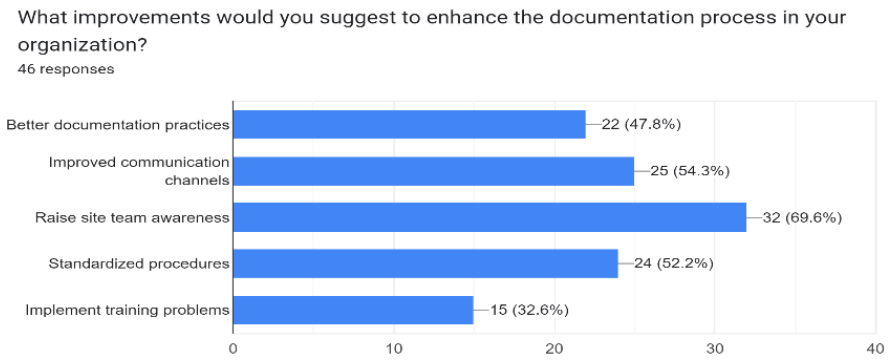

Figure 31: Documentation Process Improvements

5.7.6 Claim Preparation Process

The sixth section of the questionnaire focused on the claim preparation process, its challenges, the lacking resources and expertise in claim preparation and estimation, the adequate contractual time bar for a claim submission, and the used software for managing and tracking claims. This will help the author in highlighting the main issues affecting the process in the Egyptian market and finding possible solutions to get rid of the errors in the processes.

First of all, the author wanted to know the frequency by which the respondents encounter challenges in the claim preparation process, the first and highest two segments were “Sometimes” and “Often”, with 52.2% (n=24) and 32.6% (n=15) respectively. This shows that encountering challenges in the process is a typical case which occurs and would need attention. Whereas 8.7% (n=4) answered with “Rarely”, 2 responses were “Always” and only one response was “Never”.

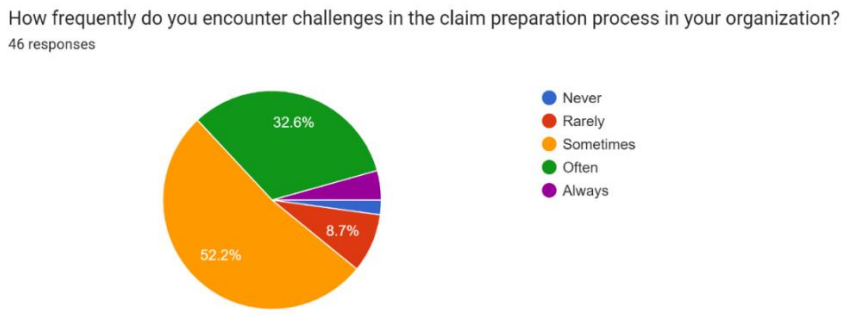

Figure 32: Claim Preparation Issues Frequency

The second question focused on capturing the most challenging tasks that the industry encounters when trying to provide detailed claim particulars, the task with the highest percentage and the most challenging was “Documentation” with 41.3% of the responses (n=19). This percentage substantiates the findings from the last section regarding the frequency, issues, and lack of documentation that was observed. As the faulty processes in the documentation and the lack of documenting verbal instructions, definitely affects and hinders the claim preparation process, as it is always difficult to proof and defend your contractual rights when the documentation and available evidence are insufficient. The next two highest percentages were the “Quantification of Costs Implications” with 23.9% (n=11) and “Delay analysis” with 19.6% (n=9), this also illustrates that there could be a lack in the expertise, tools, or standards that should be used in the quantification of implications for construction claims in the Egyptian market either on the time or cost aspects. The following percentiles were “Technical Issues” and “Compliance with Contractual Requirements” with 6.5% each (n=3). While “Legal Considerations” only got 1 response with 2.2%, as illustrated in the following Fig. 33.

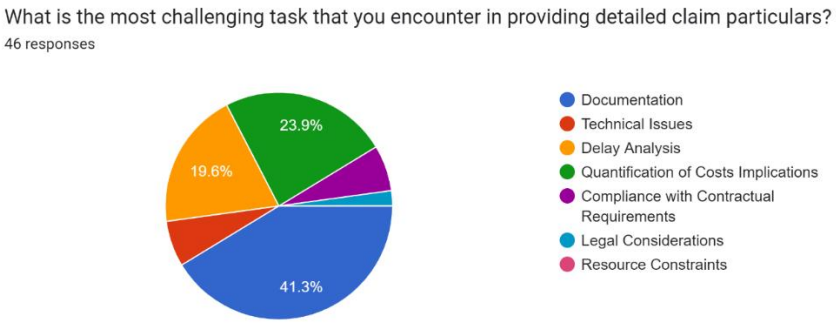

Figure 33: Claim Preparation Challenging Tasks

The author then asked about the most effective delay analysis technique that could be used in analysing and evaluating delays from the perspective of the respondents. The highest two techniques were “Time Impact Analysis” and “Window Analysis” with 43.5% (n=20) and 41.3% (n=19) percentages respectively as shown in the following Fig. 34. This illustrates that these should always be the most used techniques in the Egyptian market as they are the most effective and efficient from the expert’s perspectives. The type of delay analysis technique used when a claim is submitted is always a controversial topic and opens a lot of questions, so the choice of the appropriate technique to use should be always taken into consideration, as this will avoid further conflicts and give strong grounds to the claimant’s case and the negotiation phase. The choice of the delay analysis technique could be agreed on between the parties prior to the submission of the claims, this would solve and avoid a lot of hassle and conflicts. Another way is also adding a contractual provision with the required technique for any delay claim, the choice of such technique would depend on the type, size, scope, complexity, location, and the status of the project.

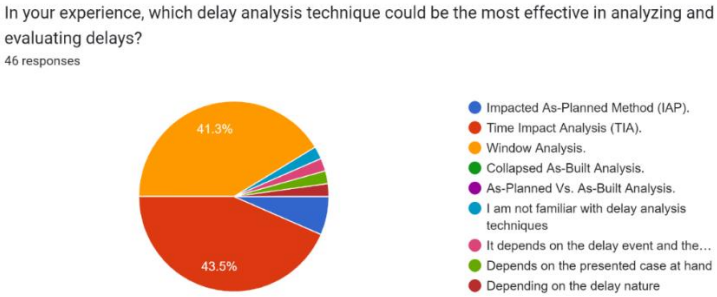

Figure 34: Effective Delay Analysis Techniques

The next question listed the most common issues that could negatively affect the claim preparation process in an organization, the respondents then were requested to rate their agreement or disagreement that such issues affect the process, in order to observe the critical factors and study their influence. The responses were as follows:

1) Claims team’s high workload: The highest response was “Neutral” with 22 respondents, followed by 13 respondents agreeing and 7 respondents disagreeing, this illustrates that there is a wide variety in the opinion on this matter, hence it could be with little significance. The following responses were 3 “Strongly Agree” and only 1 respondent “Strongly Disagree”. However, 11

out of the 13 agreeing respondents were younger professionals with less than 10 years of experience, demonstrating that either the workload is indeed higher on the lower positions and they need extra resources, or that the assigned tasks for the claim preparation process needs to be reassigned to more experienced people who can bear such workload.

2) Unclear roles/procedures for the claim evaluation process: More than half the sample responses (n=24) agreed that this is an issue that affects the process in their organization. And 12 respondents thought it was “Neutral”, the following responses were 4 for “Disagree” and 3 responses for each of “Strongly Agree” and “Strongly Disagree”.
3) Poor communication to gather the required information: The majority of the responses agreed that the communication is a critical issue that always affect the process with more than half (n=27) with “Agree” as an answer, and 9 responses for “Strongly Agree”. This proves that construction projects in Egypt always suffer from poor communication which was previously proved in the claim notification section and verified now by this majority.
4) Lack of standard formulas to evaluate impacts: Again, a majority of the responses agreed that this is a critical issue that needs attention, where 28 respondents answered “Agree”, this reckons the most challenging tasks question where it is proven that the experts always suffer in the quantification of the impacts whether in time or cost complications. The rest of the answers had close counts with 6 responses for each of “Strongly Agree” and “Disagree”, and 3 responses for “Neutral” and “Strongly Disagree”.
5) Lack of software/tools to facilitate evaluation: 16 respondents believed that the issue was “Neutral” and does not have a significant impact. While 15 respondents had answered with “Agree”, “Strongly Agree” and “Disagree” both had 6 responses each, and only one respondent strongly disagreed. This wide range between the responses demonstrates that this issue’s impact could be debatable. However, the author observed that all of the disagreeing respondents worked for organizations with more than 1000 employees, showing that this issue has a higher tendency to occur in smaller organizations that do not tend to use software and tools to evaluate claims.
6) Inaccurate/Unavailable recorded data: The responses were leaning to the agreeing side, where 16 responses were “Agree” and 14 responses “Strongly

Agree", in addition to 11 responses finding it "Neutral". The rest of the responses were "Disagree" and "Strongly Disagree" with 3 and 2 responses respectively.

7) Ambiguity of Contract Provisions: The responses received regarding this issue were relatively close, where "Agree", "Neutral", and "Disagree" had 15, 12, and 10 responses respectively. With 7 "Strongly Agree" answers, and 2 "Strongly Disagree". The author noticed that 75% of the disagreeing respondents were the experienced professionals with 10+ years of experience, demonstrating that the ambiguity of contracts is mainly encountered by younger employees and its needs knowledge and experience to overcome the issue.
8) Multiple Stakeholders involvement: The agreeing side also had an advantage regarding the issue, where 20 respondents responded with "Agree" and 16 responded with "Neutral".

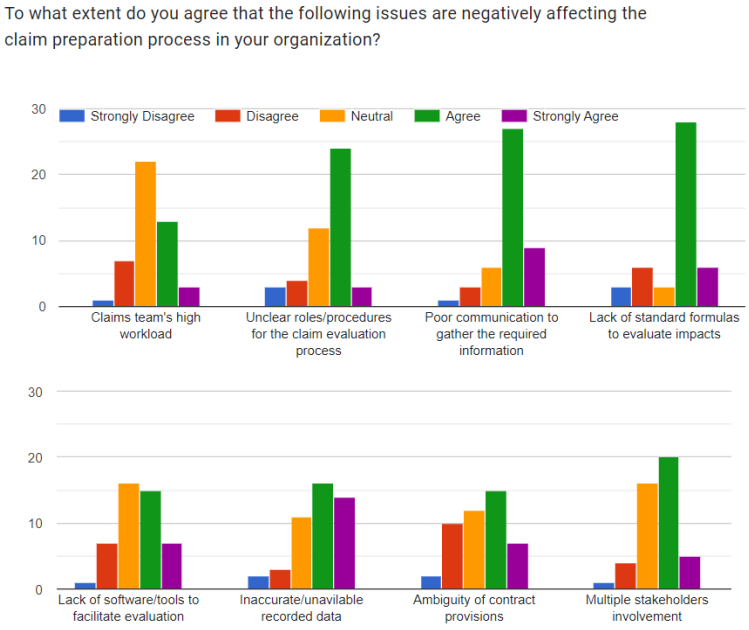

Figure 35: Claim Preparation Issues

The author then used JASP to interpret the results and create the list in table 6 below, based on the means and the standard deviations for the received responses.

The poor communication to gather the required information had the highest mean score (4.05) which indicates that it is perceived as the most significant issue that the experts encounter during the claim preparation process, also the relatively low standard deviation (0.81) suggests a strong consensus among respondents about

this problem's severity. The issue is proven to be encountered consistently in different processes among the whole management process, which indicates that it needs to be looked at to try to enhance the communication among different teams which would improve the overall performance of the projects. The author observed that the issue is predominant in larger organizations with 1000+ employees, which could be due to the large, sophisticated hierarchies which could lead to a huge gap between the different teams.

The second highest mean was (3.93), which pertains to inaccurate or unavailable recorded data, indicating that many respondents also found this to be a major challenge. This issue was also touched on in the previous section of the documentation process, so raising the awareness of accurate recording of data would enhance the procedures across different processes. However, the higher standard deviation (1.08) suggests more variability in opinions on this issue.

Multiple stakeholders' involvement, with a mean of (3.68) and a standard deviation of (0.82), is also seen as a significant issue, though opinions are slightly more varied compared to communication problems. This is mainly a concern when different teams are included in the preparation process without proper coordination or clear roles between the teams which often leads to errors affecting the whole process.

Issues such as the lack of standard formulas to evaluate impacts with a mean of (3.61), and a standard deviation of (1.06), the unclear roles and procedures for the claim evaluation process with a mean of (3.54) and a standard deviation of (0.9), and the ambiguity of contract provisions with a mean of (3.49), standard deviation of (1.05) have slightly lower mean scores but still represent notable concerns, and could easily be related to the previous issues as the lack of standard formulas to evaluate impacts is connected to the claims teams challenges in the quantification of claim implications, the unclear roles/procedures, and the ambiguity of contract provisions are directly connected to the poor communication and the multiple stakeholders involvement, so these issues are mainly interconnected.

Lastly, the lack of software or tools to facilitate evaluation has a mean score of (3.44) and a standard deviation of (0.95), and the claims team's high workload, with a mean of (3.39) and a standard deviation of (0.89), are perceived as the least significant

issues among the ones listed which are dealt with adequately in the Egyptian market, but they still pose considerable challenges.

Claim Preparation Issues

	Mean	Std. Dv.
Poor communication to gather the required information	4.049	0.805
Inaccurate/unavailable recorded data	3.927	1.081
Multiple stakeholders involvement	3.683	0.820
Lack of standard formulas to evaluate impacts	3.609	1.064
Unclear roles/procedures for the claim evaluation process	3.537	0.897
Ambiguity of contract provisions	3.488	1.052
Lack of software/tools to facilitate evaluation	3.439	0.950
Claims team's high workload	3.390	0.891

Table 6: Claim Preparation Issues

5.7.7 Claim Submission Process

In the seventh section of the questionnaire, the author focused on the claim submission process, the issues that are faced during such processes, the frequency of delays in the submissions, the availability of standard forms, the effectiveness of the process in the organizations, and the adequate timings for the claim submission.

In the first question, the author wanted to know the frequency of experiencing delays in submitting the claims to the relevant parties. The highest percentage was “Sometimes” with 43.5% (n=20), this shows that it is quite common for parties to delay the claim submission which should not be the case. Moreover, “Always” and “Sometimes” had also significant percentages with 19.6% (n=9) and 17.4% (n=8) respectively, which further proves that it is a crucial issue and would need more attention. However, “Rarely” had 9 respondents with 19.6%, as shown in Fig. 36.

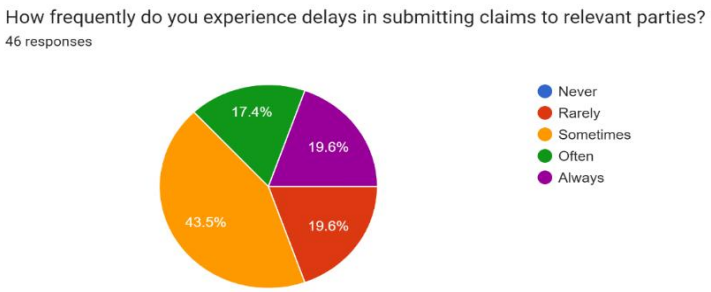

Figure 36: Claim Submission Delays

The next question was regarding the respondents' opinion on their organization's performance in the claim submission process and its effectiveness. 50% (n=23) of the respondents were "Neutral" about the effectiveness of the process in the organization, which might need more enhancement. Also, 39.1% (n=18) see that the process is in the organization is effective and hence, this shows that the effectiveness of the claim submission process is not considered to be an issue within the Egyptian market. 4 Respondents believe that the process is "Ineffective" and needs improvements with 8.7%, while only one respondent has chosen "Very Effective".

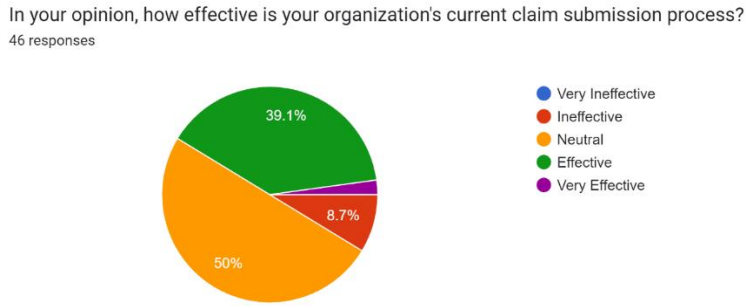

Figure 37: Claim Submission Effectiveness

The author then asked the respondents about the adequate contractual time bar that could be considered in the claim submission process to give the parties the opportunity to appropriately prepare and substantiate their claim's particulars and build the case. While this duration and the time bar could be subjective, as it would definitely depend on the project's size, complexity, price, and duration, the responses will give insights on a range of the adequate duration that would be helpful as a reference and might be adjusted then to align with the project's conditions and requirements.

The results showed that 21 respondents, which is 45.7% of the sample, have responded that “42 days” should be an adequate contractual duration that should be considered. Whereas “28 Days” and “56 Days” have also had a decent number of responses with 12 and 9 responses respectively, corresponding to 26.1% and 19.6% of the total sample. The other responses were distributed over other segments with 1 respondent for each of them, while one of them also mentioned a duration of “42 Days if the event has no continual effect”, this supports the case that the 42 Days is the most common duration which would be suitable for all the parties. So, it is always recommended to abide by a minimum of this duration when preparing the contract in order to facilitate the process for all the parties. This alignment is usually done in the tendering/negotiation phase of the contract by both parties involved, and the agreement/alignment on conditions like these in the contract would definitely facilitate the disputes resolution processes future in the project realization phase, and might even avoid potential conflicts between the parties, all as a result of alignment done before the commencement of the project. The results are shown in Fig. 38 below.

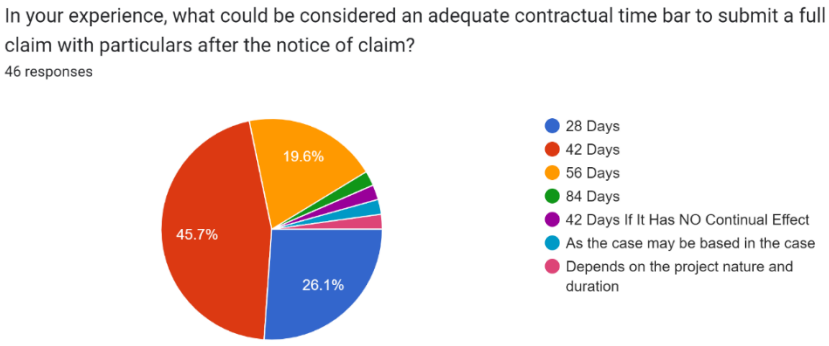

Figure 38: Claim Contractual Time Bar

The next question listed the most common issues that could negatively affect the claim submission process in an organization. Respondents were then requested to rate their agreement or disagreement that such issues affect the process to observe the critical factors and study their influence. The responses were as follows:

1) Inaccessibility of documents: The highest response was "Agree" with 18 respondents, followed by "Strongly Agree" with 7 respondents. This indicates that document accessibility is a significant issue with the consensus. However, "Disagree" was the response of 12 respondents, while 8 were "Neutral" and

only 1 respondent "Strongly Disagreed". Though there is some variability in the opinions, it should need more attention.

2) Lack of standard form for claims: The most common response was "Neutral" with 16 respondents, indicating a moderate level of concern. "Agree" was selected by 15 respondents, "Disagree" by 9 respondents, and both "Strongly Agree" and "Strongly Disagree" were chosen by 3 respondents each. This shows mixed perceptions about the impact of lacking standard forms.
3) Unclear roles/procedures for the claim preparation and submission: The majority of respondents (19) agreed that unclear roles and procedures are a problem, and 16 were "Neutral". Moreover, "Strongly Agree" was selected by 2 respondents. While around 70% of the agreeing respondents had less than 10 years of experience, this highlights the need for clarity in roles and procedures in the claim submission process, as the projects' teams, and specially the non-experienced individuals, face difficulty in understanding their roles in the process which would eventually disfunction the whole process. However, 6 respondents disagreed, and 3 strongly disagreed.
4) Lack of competent staff in preparing a claim submission: Most respondents agreed that this is significant issue with a total of 18 responses, Whereas 11 were "Neutral" about it. "Strongly Agree" was chosen by 7 respondents, while "Disagree" and "Strongly Disagree" were chosen by 7 and 3 respondents, respectively. The predominant agreeing portion were from individuals with less than 10 years of experience, indicating a general consensus on the need for competent and experienced staff for the whole claim submission process, as individuals without enough years of experience struggle a lot with the preparation process and eventually need assistance from experts.
5) Poor communication between teams in claim submission: The huge majority of 27 respondents agreed that poor communication is a critical issue, and 9 respondents strongly agreed. Moreover, "Neutral" was selected by 8 respondents, this proves that poor communication is widely recognized as a problem in the claim submission process as previously indicated in the previous sections of the questionnaire, indicating it as a crucial issue in the whole Egyptian market especially in larger organizations with more than 1000 employees.

6) Contractual time bar for claim submission is inadequate: The responses were more varied with 16 respondents being "Neutral", 14 respondents agreeing, and 11 respondents disagreeing. "Strongly Agree" was chosen by 5 respondents, indicating mixed opinions about the adequacy of the contractual time bar, however this issue was observed to be encountered more by less experienced individuals, where most of the agreeing answers were from the less than 10 years of experience individuals who would need more time and experience to adapt to the contractual time bars. This issue was also discussed in the previous question with the recommendation of the adequate contractual time bar for the claim submission to avoid potential conflicts.
7) Fear of relationship damage with the owner: The highest response was "Strongly Agree" with 19 respondents, followed by 17 who agreed. This shows that fear of damaging relationships with the owner is a significant concern for many respondents, where in many cases the project team decide not to submit a claim in order to preserve the friendly relationship with the owner, this eventually affects the whole performance of the project. "Neutral" was selected by 6 respondents, with "Disagree" and "Strongly Disagree" chosen by 1 and 3 respondents, respectively.

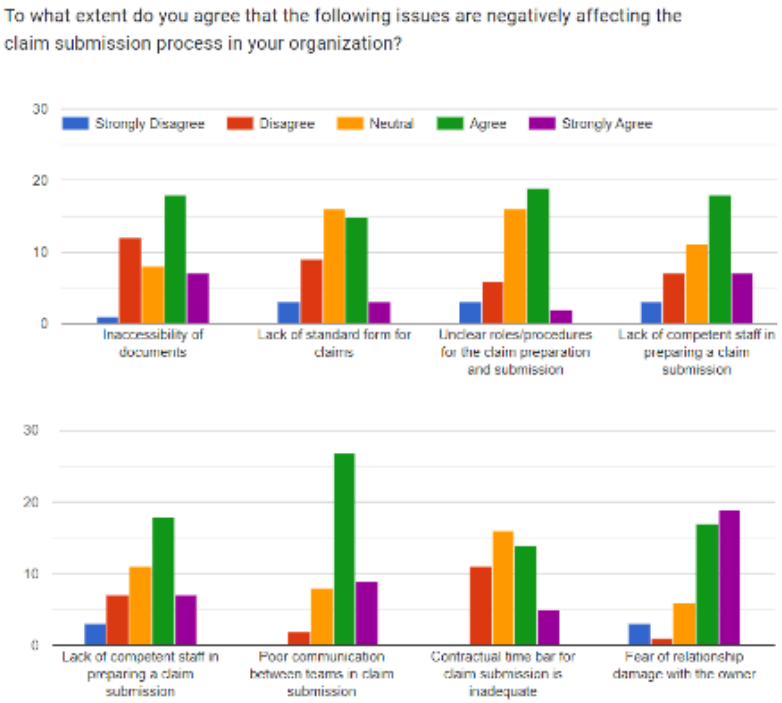

Figure 39: Claim Submission Process Issues

JASP was then used to analyse the date and formulated the table 7 below. The table outlines several critical issues affecting the claim submission process within organizations, as rated by respondents on a Likert scale. The mean and standard deviation values for each issue provide valuable insights into their perceived significance and variability.

The fear of relationship damage with the owner emerged as the most significant issue, with a mean score of (4.2), this high mean indicates that respondents strongly agree that this fear substantially impacts the claim submission process. The relatively high standard deviation of (1.08) suggests some variability in responses, but there is an overall strong consensus on its importance. As previously mentioned, the project's team often decides not to submit a claim to preserve the relationships, this impacts the cost and time pf the project and the whole performance of the organization. This highlights the delicate balance project teams must maintain in their interactions with owners to avoid jeopardizing relationships while ensuring that claims are submitted appropriately to preserve the company's rights.

However, poor communication between teams in the claim submission process is another critical issue, with a mean score of (4.07), this high score reflects broad agreement on its negative impact, and the lower standard deviation of (0.69) indicates less variability in responses. This suggests a strong, consistent perception of this issue among respondents among different processes, underscoring the criticality of the issue in the whole project and the need for improved communication channels and protocols to enhance the efficiency and accuracy of the claim submission process, the project management process, and the whole organization performance.

Inaccessibility of documents is perceived as a moderately significant issue, with a mean score of (3.63) and a standard deviation of (1.02), The mean score above average indicates that many respondents see it as a problem, although experiences may differ. This is also consistent with the inaccessibility of documents for the claim identification process; hence the same issue affects different processes. The results highlight the importance of ensuring that all relevant documents are easily accessible to streamline the claim identification, notification, preparation and submission process.

The lack of competent staff in preparing claim submissions also stands out as a concern, with a mean score of (3.61) and a standard deviation of (1.05), the mean score suggests general agreement on its impact, while the variability in responses indicates differences in experiences and perceptions among respondents. Addressing this issue through targeted training, development programs, and attracting new experts/calibres can enhance the competence of staff involved in claim preparation.

Unclear roles and procedures for claim preparation and submission have a mean score of (3.46) and a standard deviation of (0.93), this indicates a slightly significant issue, with some respondents seeing it as a problem while others do not find it as significant. Clarifying roles and standardizing procedures can help mitigate confusion and improve the efficiency of the claim submission process.

Lastly, the inadequacy of the contractual time bar for claim submission and the lack of a standard form for claims with the lowest mean scores of (3.39) and (3.07) respectively and standard deviations of (0.92) and (1.08), indicates that they are seen as the least significant issues among those listed. The mixed feelings and variability in responses suggest that while some respondents see them as a challenge, others may not perceive it as critically. However, the definite thing is that these issues could some time affect the process and the quality of the submission, the adequate contractual time bar and the availability of standard forms would facilitate the process to the project team and result in a high-quality result with avoiding potential conflicts. Reviewing and adjusting contractual time bars before contract initiation and standardizing the submission forms could help address this concern.

In summary, the data highlights that the fear of relationship damage with the owner and poor communication between teams are the most critical issues affecting the claim submission process, with high mean scores and relatively lower variability. Inaccessibility of documents, lack of competent staff, and unclear roles/procedures are also significant concerns but to a slightly lesser extent. The inadequacy of the contractual time bar and lack of standard forms for claims are seen as less significant, though they still pose challenges. Addressing these issues, particularly the top concerns, is essential for improving the claim submission process and maintaining an effective process.

Claim Submission Issues

	Mean	Std. Dv.
Fear of relationship damage with the owner	4.195	1.077
Poor communication between teams in claim submission	4.073	0.685
Inaccessibility of documents	3.634	1.019
Lack of competent staff in preparing a claim submission	3.610	1.046
Unclear roles/procedures for the claim preparation and submission	3.463	0.925
Contractual time bar for claim submission is inadequate	3.390	0.919
Lack of standard form for claims	3.073	1.081

Table 7: Claim Submission Issues

5.7.8 Claim Negotiation and Dispute Resolution Mechanisms

The eighth section of the questionnaire focused on the issues affecting the claims negotiation process, the most common dispute resolution mechanisms, and the most effective mechanisms from the respondents' experience.

In the first question, the author asked the respondents how they think their organization is successful in the claims negotiation process, both "Neutral" and "Successful" had the highest percentages with 39.1% (n=18) each, the next one was "Very Successful" with 13% (n=6). This demonstrates the relatively high rate of success of the negotiations part in the Egyptian market, or at least from the organization's point of view, this might be further discovered in the next questions. "Unsuccessful" and "Very Unsuccessful" had the least responses with 3 and 1 respectively, as demonstrated in Fig. 40 below.

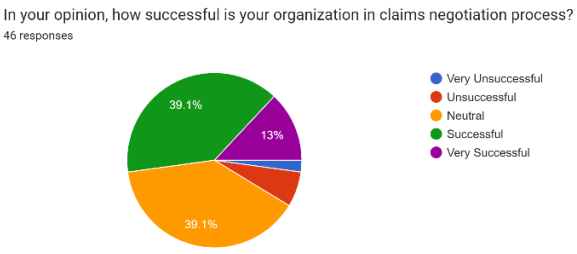

Figure 40: Claims Negotiations Success

The author listed the various issues that could negatively impact the claim negotiation process within organizations and the respondents rated their agreement to the degree that these issues affect the process. The analysis of these responses provides insights into the critical factors influencing the negotiation phase of claims, the results were as follows:

1) Poor negotiation skills: 15 respondents answered with “Agree” and 8 “Strongly Agree”, while 10 respondents were “Neutral”, this shows that the majority either agreed or were neutral about this being a critical issue, indicating a need for negotiation training and development in the needed organizations. However, disagreement was noted by 10 respondents, and 3 strongly disagreed. This distribution suggests that a considerable number of respondents acknowledge poor negotiation skills as an issue, especially individuals with less than 10 years of experience, which could be justified by the lack of experience or of negotiating situations and skills which could be acquired at the later stages of the career.
2) Disagreement arising during negotiation: It is widely recognized as a problem, with a majority of 27 respondents responding with “Agree” and 3 respondents “Strongly Agree”. Only a small number of respondents disagreed with 4 respondents and 1 respondent strongly disagreed, while 11 were “Neutral”. This strong consensus highlights the frequent occurrence of disagreements during negotiations, where the dominant side was the Contractor organizations which face this issue more, emphasizing the need for better conflict resolution strategies and clearer communication channels to mitigate this issue from all parties of the project.
3) Unsatisfactory supporting documents: A large number of 20 respondents have responded with “Agree”, and 11 “Strongly Agree”, while 10 respondents were “Neutral”. This proves that the quality of supporting documents is often inadequate and indicates a general consensus on the importance of high-quality documentation in facilitating successful negotiations and suggests that improving documentation standards could positively impact the negotiation process. However, a small number of respondents disagreed 3 and 2 strongly disagreed.

4) Insufficiency of negotiation duration: The results were more varied and took thr shape of a normal distribution with 20 respondents being “Neutral”. Whereas 11 respondents responded with “Agree” and 3 responses “Strongly Agree” On the other end, “Disagree” and “Strongly Disagree” responses were 9 and 3 respectively. This mixed response indicates that while some see the negotiation duration as a constraint, others do not view it as critically. This suggests that negotiation timelines may need to be more flexible to accommodate the complexity of different cases.
5) Compromising to avoid relationship damage: The results were significantly leaning towards the agreeing side with 16 responses as “Agree” and a huge number of 18 “Strongly Agree” while 8 respondents were “Neutral”. This strong consensus highlights the delicate balance between negotiating assertively and maintaining positive relationships, indicating a need for strategies that allow for effective negotiation without compromising relationships. Only a few respondents disagreed with 2 respondents for each of “Disagree” and “Strongly Disagree” illustrating how crucial this issue is.
6) Insufficient preparation: The results also leaned a bit towards the agreeing side, but with the highest number of respondents being “Neutral” with 16 responses. Moreover 15 respondents answered with “Agree” and 8 responses “Strongly Agree”. Fewer respondents disagreed with 4 “Disagree” responses and 3 “Strongly Disagree”. This distribution suggests that while preparation is recognized as crucial, there is variability in how well it is executed, pointing to a need for attention for an improved preparation processes to facilitate the negotiation phase and increase the success rate of the processes.
7) Rigid and inflexible positions: More than half the sample have responded to this issue with “Agree” with 24 respondents which shows a need of notable attention. 5 responses were “Strongly Agree” and 11 were “Neutral” that illustrates how the inflexibility in the negotiation processes could be problematic. A small number of responses disagreed with 3 responses for each of “Disagree” and “Strongly Disagree”. This suggests that fostering a more flexible negotiation approach could lead to more successful outcomes.
8) Lack of transparency: Once again, the scale leaned towards the agreeing side. Whereas 19 respondents agreed, and 8 strongly agreed that transparency is often lacking, while 14 were neutral. Few respondents

disagreed with a total number of 2 responses and 3 “Strongly Disagreed. The author also observed a trend that the agreement was dominant in Contractor organizations, showing that the issue could be faced from contractors more often, and that the owner/project management side could sometime lack the transparency aspect, which leads to signs of doubt and reliability, affecting the whole process and eventually leading to more conflicts. This indicates a consensus on the importance of transparency in negotiations and shows that the parties might sometime lack transparency during the processes. This suggests that enhancing transparency could improve trust and effectiveness in the negotiation process.

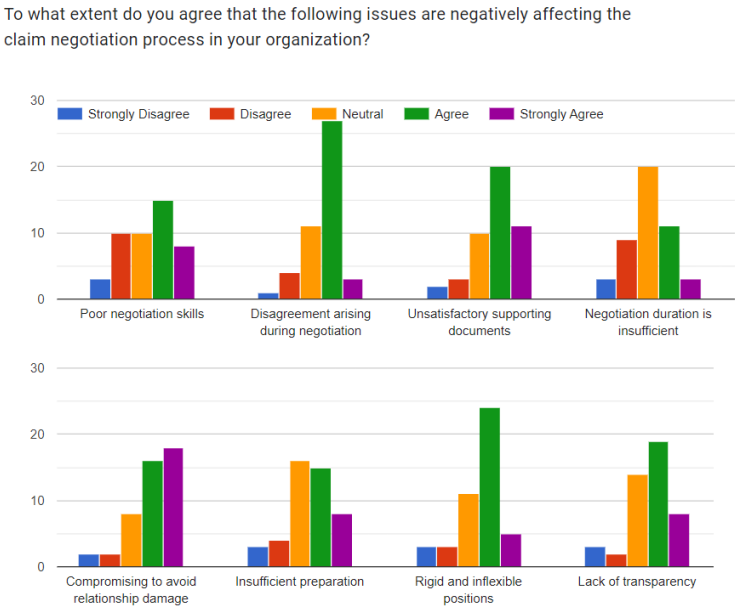

Figure 41: Claim Negotiation Issues

The author exported table 8 below with the list of issues to analyse the data, the table provides a detailed statistical analysis of the various issues that could negatively impact the claim negotiation process within organizations. Each issue was rated by respondents, and the mean scores along with standard deviations offer insights into their perceived severity and variability in responses.

Compromising to avoid relationship damage emerged as the most significant issue, with the highest mean score of (4.12) and a standard deviation of (0.98), this high mean indicates that many respondents strongly agree that this is a prevalent issue. The relatively low standard deviation suggests there is some consensus among respondents, this is totally consistent with the fear of damaging relationships with

owners, which was faced in the claim submission process. The issue should be resolved by raising awareness to the project's teams about the rights of their organization and how to preserve these rights without affecting the relationship with the required balance.

Next on the list was the Unsatisfactory supporting documents which also scored high with a mean of (3.81) and a standard deviation of (1.05), indicating that the quality of documentation is often deemed inadequate, affecting the negotiation process. The slightly higher standard deviation reflects a moderate variation in responses, suggesting that while many see it as a critical issue, opinions on its severity vary, however as it is still considered to be a crucial issue, it relates to the claim documentation issues and the resolving of documentation issues would eventually lead to satisfactory and adequate supporting documents.

The lack of transparency is another significant issue, with a mean score of (3.78) and a standard deviation of (0.91), suggesting that many respondents agree that transparency is often lacking in negotiations especially from the sides opposing the contractors, which can hinder trust and effectiveness, whereas the lower standard deviation indicates a relatively consistent view among respondents on the importance of transparency, and how it could affect the whole process. Hence, this should be addressed by owners, by entering the negotiation process with complete transparency and openness to try to reach a mutual agreement benefiting all parties.

Moreover, disagreements arising during negotiations scored a mean of (3.63) with the lowest standard deviation of (0.8), highlighting the agreement among respondents about the prevalence of this issue and that conflicts and disagreements are common issues that can derail negotiations. The parties should initially set common goals and prioritize the claimed issues in order to avoid such types of disagreements in the negotiations, which leads to more complex conflicts and eventually to Arbitration (or any other dispute resolution mechanism).

Both, "Rigid and inflexible positions during negotiations" and "Poor negotiation skills" had a mean score of (3.59), but the former with a standard deviation of (0.97), and the latter with (1.16). This reflects the fact that inflexibility and lack of negotiation experts are to be considered as a notable concern, as they affect the ability to reach mutually beneficial agreements. The variation in responses indicates that while many

see them as problematic, some respondents might experience it differently especially on the negotiation skills issue where there is variation in how respondents perceive its severity, possibly reflecting differing levels of negotiation expertise within organizations.

Insufficient preparation for negotiations had a relatively lower mean score of (3.56) and a standard deviation of (1.07), which points to preparation as a factor that is sometimes lacking, affecting the quality of negotiations. Whereas Negotiation duration being insufficient had the lowest mean score of (3.37) with a standard deviation of (0.92), indicating that time constraints could be an issue, but they are considered less critical compared to other factors and the moderate standard deviation shows that the respondents view the negotiation time for claims are usually sufficient.

Claim Negotiations Issues

	Mean	Std. Dv.
Compromising to avoid relationship damage	4.122	0.980
Unsatisfactory supporting documents	3.805	1.054
Lack of transparency	3.780	0.909
Disagreements arising during negotiations	3.634	0.799
Rigid and inflexible positions	3.585	0.974
Poor negotiation skills	3.585	1.161
Insufficient preparation	3.561	1.074
Negotiation duration is insufficient	3.366	0.915

Table 8: Claim Negotiation Issues

The author then asked the respondents on the dispute resolution mechanisms that they have commonly experienced in construction contracts in the Egyptian market to resolve claims. A massive majority with a total of 44 out of the 46 respondents (95.7%) commonly experienced negotiation as the dispute resolution mechanism, illustrating the complete overspreading of Negotiation as the most commonly used

dispute resolution mechanism in the Egyptian market. Where this overspreading shows its success in the market as organizations tend to use it to resolve their conflicts and continue in doing so due to its effectiveness and relatively low cost. The next on the list was Arbitration with 13 respondents and a percentage of 28.3%, showing that parties would depend on Arbitration to resolve their conflicts if the amicable negotiation between the parties failed and that parties would often prefer Arbitration on Litigation, due to its shorter processing times and effectiveness. Also Mediation had a reasonable result with 10 respondents (21.7%), showing that parties tend to utilize friendlier approaches for dispute resolution, to avoid legal cases, lengthy procedures, costly efforts, and damaging their relationship. The rest of the dispute resolution mechanisms were insignificant with 1 respondent for each as shown in Fig. 42 below, illustrating their negligence and underuse in the Egyptian market.

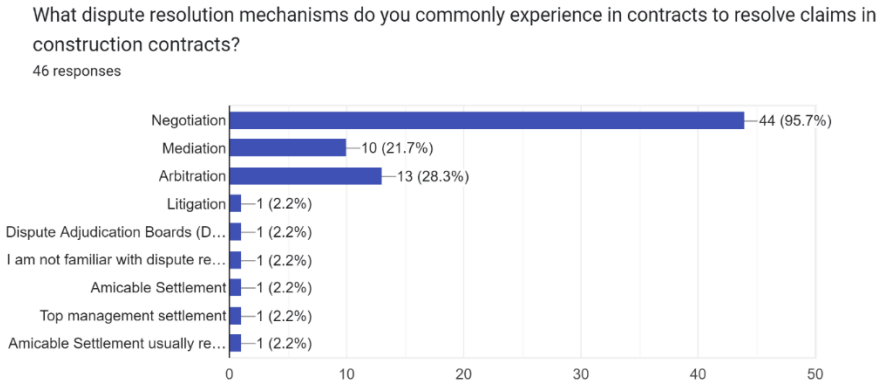

Figure 42: Common ADRs

After understanding and recognizing the commonly used Dispute Resolution Mechanisms in the Egyptian market, the author asked the respondents about the most effective ADR method that could be considered and used in resolving construction conflicts from their experience. Nearly half of the sample, with a percentage of 47.8% (n=22) perceives Negotiation as the most effective dispute resolution mechanism and would prefer to utilize it in resolving conflicts. This could be because of many aspects, such as their familiarity with the mechanism, being the most commonly used, it could also be as a result of its low costs and the avoidance of involving any third party in the negotiation phase. The second highest segment was the Dispute Adjudication Boards (DAB), with a total of 26.1% as 12 respondents

considered it to be an effective method. Based on the precious questions DABs are still not widely used in Egyptian projects, and this illustrates that the market needs awareness to its methodologies, advantages, and effectiveness, in order to start operating with DABs in Egyptian construction projects, which primarily provides a mechanism for early and continuous resolution of disputes. This proactive approach helps to minimize conflicts and prevent disputes from escalating, thereby saving time and reducing costs associated with prolonged negotiations or arbitration which parties often would like to avoid.

Mediation was next on the list with 13% (n=6), again showing the inclination towards the friendly ADR, without the need of involving external parties to save cost, effort, and preserve relationships among parties. The rest of the ADRs had secondary insignificant portions with Arbitration (n=3) and Litigation (n=1), and this is consistent with the market's preference on avoiding legal and formal procedures.

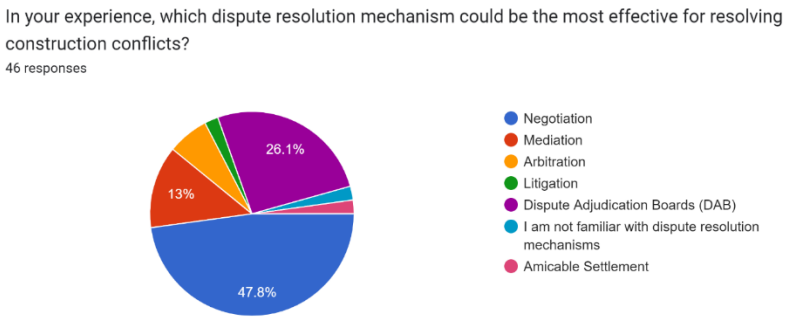

Figure 43: Most effective ADRs

5.7.9 Questionnaire Additional Information

In the final section of the questionnaire, the author asked the respondents some open-ended questions to gain insights about their experiences, thoughts, suggestions, and recommendations regarding the implementation of measures, strategies, and best practices to overcome the challenges for the claims management procedures and the dispute resolution mechanisms, to enhance the overall process.

The author first asked about the measures that can be implemented to improve the claims management processes in construction projects and make them evolve into efficient and effective processes, there were different opinions and insights for the

measures that can be followed, some respondents suggested that the owners shall clarify the claim procedures in the contracts and shall give sufficient time for the contractor in order to be able to notice the event and to analyse it's consequences, that is a way of improving the process, others recommended educating the site team on causes of claims, how to deal with claims once they arise, and how to document and record effects, this is to facilitate the contract administrator's role of linking cause and effect and substantiating claims.

Also, some people suggested to start leveraging from technology and automation, by making use of AI tools and data driven decision making. However, the most common answer which was gathered and significantly affected most of the respondents was the documentation process, the respondents emphasized on the necessity of proper documentation and data management, several respondents also wanted to start the utilization of advanced technologies and specialized claims management software to handle the whole process by documenting the history of the project starting from the Kick off meeting until the handover of the project.

These answers are aligned with the previous sections of the questionnaire which highlighted the lack of software usage in organizations and the poor documentation process, which is a major issue in the Egyptian industry. Here are two responses from the respondents, which the author thinks summarizes a lot about the documentation process in the Egyptian construction industry: One respondent mentioned “A software responsible for claims management and tracking where all parties in a project can access and communicate through would help improve and facilitate claims resolution together with setting clear and approved procedures for claims submissions to be strictly followed when an event giving rise for a claim occurs. In addition to educating all concerned parties in any given project about the details of such procedures and how to effectively comply with each one of them”.

Another respondent also mentioned the following “Claim management process requires improvement in 3 main segments including documents management and ease of access for team members, the second is the clear and approved procedures to be followed by all relevant parties especially the communication procedures and to ensure that all team members in each party are well trained and fully capable to commit to these procedures, finally, the quantification process and claim resolution techniques which have to be clearly reflected in the contract and discussed in detail

between all the involved parties". These answers underscore the need for proper documentation management, clear roles and procedures for project teams, and a standardized quantification process that would facilitate the whole process for all the parties.

The second question was regarding the respondents' experience with dispute resolution mechanisms, where the author asked the respondents to share their experiences with (ADR) methods to resolve construction claims. Most respondents have not had any previous experience with ADR or dispute resolution, however some respondents mentioned that they have tried arbitration, but it was costly and time consuming, so as DAB which was not successful in their case.

Also, some respondents mentioned that they tend to lean towards mediation or negotiation over arbitration as they think that it is cost consuming. This proves that there is still till now issues and misconceptions about the means of using and dealing with different ADR mechanisms, where individuals could be unaware of the procedures of the process, or just utilize the process for monetary benefits without considering the actual purpose of the process. Hence, the different ADR techniques need a process of raising awareness to their actual procedures and purposes in Egypt in order to serve their purpose and facilitate the conflict resolution process.

However, one of the responses summarized the whole ADR process in Egypt where they answered "I have experienced a sophisticated negotiation process between a contractor and a subcontractor that became so intense that the performance guarantee was about to be liquidated. Things were resolved later on with a settlement agreement. What I have learned through this encounter and others is that business relationship matters the most. Companies always value the continuity of their businesses more than anything else, accordingly, how they approach claims and to what extent they are willing to go in terms of dispute resolution depends on the market that they are engaged in. In Egypt for example, ADR techniques are not so popular and are not implemented extensively due to the reason state above. Unfortunately, employers consider the application of ADRs as a hostile approach, and this may jeopardize the contractor's chances of getting future projects."

6. Findings and Recommendations

This chapter presents the findings from the questionnaire and questionnaire conducted with construction and claims experts in the Egyptian construction industry. The results are analysed in relation to the research objectives outlined in the introduction, highlighting key issues and providing insights into the current state of claim management processes and dispute resolution mechanisms in the Egyptian market and comparing them to the international market.

Evaluation of the issues impacting the Claim Management Process in the Egyptian Construction Industry

The questionnaire results reveal several critical issues affecting claim management practices in the Egyptian construction industry.

- One of the most significant challenges identified is poor communication between site teams and claims teams, particularly in larger organizations, this issue has been consistent and significant through all the stages of the claim management processes throughout the project timeline. Especially Larger organizations (with over 1000 employees) often have complex hierarchical structures that create communication barriers and delays in identifying and reporting claims. This fragmentation of information and lack of coordination among departments make it difficult to manage claims effectively and promptly.
- The documentation process in the Egyptian construction industry has also been proven as a major issue throughout the questionnaire and in the different stages of the claiming process. Where, Inadequate documentation of events was highlighted as a critical issue, as effective claim identification and management require accurate documentation and record-keeping, which can be challenging to maintain at scale. The questionnaire showed that a significant portion of respondents still rely on outdated methods such as email for managing notifications, and others do not use any system at all. This lack of digitalized systems leads to inefficiencies, inaccuracies, and increased risks, emphasizing the need for adopting specialized claims management software, as manual data entry techniques are prone to errors, and traditional

methods of storing documents are inefficient and time-consuming. The questionnaire indicated that larger organizations are more likely to have digitalized documentation processes, but smaller organizations still face significant challenges.

- In addition, the lack of documenting verbal instructions and inaccuracies in recorded data were significant problems, leading to major conflicts affecting efficiency, accuracy, and accountability, verbal instructions are often misheard or misinterpreted, causing confusion and resulting in unclear directives and incomplete task execution. This lack of documentation hinders accountability, complicates conflicts, and results in inconsistent implementation, errors, omissions, and project delays. From a legal and contractual standpoint, verbal instructions are often not recognized, leading to non-compliance with contract terms and weakening the position in claims and disputes. To mitigate these problems, implementing documentation practices for verbal instructions is essential, such as using standard forms like Confirmation of Verbal Instructions (CVI) and applying FIDIC standard provisions that require written confirmation of verbal instructions within a specified period to ensure clarity and compliance.
- Fear of damaging relationships with project owners was expressed as a concern from many respondents. This fear often leads to a reluctance to notify or submit claims, resulting in compromised project performance. A significant number of respondents indicated that preserving a friendly relationship with the owner was a priority, even at the cost of submitting necessary claims. This even often affected the claim negotiation process as compromising to avoid relationship damage was indicated as an issue by many respondents, this would be in order to maintain business relationships which is a common practice and can undermine the effectiveness of dispute resolution processes.
- The study responses also showed a need for clearer roles and procedures for the claim management processes, where less experienced professionals particularly struggle with understanding their roles, highlighting the need for better training and awareness and the standardization of roles and procedures to facilitate the whole project management process.
- The responses regarding the adequacy of contractual time bars for notification were mixed, suggesting a conflict between contractors and project managers

or owners, which indicates the necessity for clearer contractual provisions that are mutually agreed upon and understood by all parties.

- Lack of transparency and unsatisfactory supporting documents were noted as critical issues affecting the negotiation and resolution of claims, parties should communicate at the initiation phase of the dispute resolution and share their thoughts and goal in order to set common grounds for negotiations and facilitate the whole process by full transparency and visibility to avoid additional conflicts. Whereas the unsatisfactory supporting documents is again a direct result of the absence of robust documentation systems which makes it difficult to support claims adequately and emphasizes the criticality of the issue.
- There is a general reluctance to adopt alternative dispute resolution (ADR) methods with preference for traditional methods over ADR such as arbitration and DAB, with many respondents perceiving these methods as costly and time-consuming. This highlights a need for greater awareness and education about the benefits and processes of ADR.

When compared to international practices, the Egyptian construction industry shows a significant lag in adopting some modern claim management and dispute resolution techniques. The reliance on manual processes, poor communication, and inadequate documentation are issues that have been largely addressed in more developed markets through digitalization and more sophisticated management practices which should be tackled in the Egyptian construction industry in order to align with the international norms, standards, and practices.

Recommendations for Improvement

Based on the findings, several recommendations can be made to improve claim management processes and dispute resolution mechanisms in the Egyptian construction industry:

1. Enhancing Communication: Implementing better communication tools and protocols, this should be mainly adopted by contractors as they are the most impacted based on the questionnaire, and especially in larger organizations, this can help bridge the gap between site teams and claims teams, the enhancement could be done by establishing clear communication channels

for different types of instructions and updates. For instance, using emails or official letters for formal instructions, project management software for task updates, and meetings for complex discussions and ensuring that all important verbal instructions are followed up with written documentation.

2. Implementing the Confirmation of Verbal Instructions (CVI): Contractors should start adopting the use of standard forms such as the Confirmation of Verbal Instructions (CVI) by following standard provisions (Such as FIDIC or any other international standard) to ensure all verbal instructions are documented immediately. These forms should include details of the instruction, the person giving and receiving the instruction, the date and time, and the specific action required.
3. Utilizing Technology and Software Solutions: Organizations and especially Contractors should start transitioning to digital document management systems and project management software that includes features for documenting instructions, tracking progress, and managing communication. These tools can facilitate documentation processes and ensure that all instructions are recorded and accessible to relevant stakeholders by improving efficiency, accuracy, and accessibility of information, which eventually reduces the risks associated with manual processes.
4. Training and Awareness: Organizations and especially Contractors should provide regular training sessions for project team members on effective communication practices and the importance of documenting verbal instructions and providing trainings for less experienced professionals on contractual matters, claim management processes, and the use of specialized documentation tools and software to ensure the improvement of the overall performance.
5. Improving Contractual Provisions: Organizations such as Owners, Developers, and Project management firms should consider improving and developing clearer and more specific and advanced contractual provisions regarding notification time bars, notices requirements, claims processes, and dispute resolution processes which can help in reducing conflicts and misunderstandings.

6. Promoting ADR Techniques: Organizations such as the Cairo Regional Centre for International Commercial Arbitration (CRCICA), the International Chamber of Commerce (ICC) in Cairo, and The Egyptian Centre for Arbitration and Settlement (ECAS) should start raising awareness about the benefits and procedures of ADR methods which would encourage their adoption and improve the resolution of disputes in a cost-effective and timely manner.

By addressing these issues and implementing the recommended improvements, the Egyptian construction industry can significantly improve and align its practices with international standards, leading to better communication, fewer disputes, and more efficient and effective claim management and dispute resolution processes.

7. Future Research

The complex nature of construction projects in Egypt presents numerous opportunities for future research, particularly in the field of claims management and dispute resolution. One critical area for investigation is enhancing communication to bridge gaps between project teams and identifying suitable technology and software for claims and documentation management in the Egyptian construction market, Future studies could explore the implementation of advanced communication strategies and project management software, examining the resulting effects on claims processes, documentation accuracy, project efficiency and overall success. Understanding how improved communication and software implementation will influence project outcomes can provide valuable insights into promoting better collaboration, reducing misunderstandings, and possible improvements in managing claims and disputes.

The effectiveness of training programs on documentation practices among construction professionals is another promising research area where studies could measure changes in documentation quality and frequency before and after targeted training initiatives, highlighting the importance of professional development. Such research could provide evidence-based recommendations for designing effective training programs that enhance the documentation skills of construction personnel.

Finally, raising awareness about the benefits and procedures of Alternative Dispute Resolution (ADR) methods is also crucial for improving the resolution of disputes in the Egyptian construction industry. Future research could focus on strategies to promote the adoption of ADR methods, evaluating their impact on resolving conflicts in a cost-effective and timely manner. Understanding the barriers to ADR adoption and developing educational programs to overcome these challenges could significantly enhance dispute resolution processes.

By pursuing these future research directions, researchers and practitioners can contribute to a deeper understanding of effective claims management and dispute resolution in the Egyptian construction industry. These studies will help identify best practices, promote the adoption of innovative solutions, and ultimately improve project outcomes in terms of cost, time, quality, and stakeholder satisfaction.

8. Conclusion

One of the interesting areas in construction management is construction claims, which deals with claims management at every stage of the construction project, from the point of identification of a claim to negotiation and the resolution of disputes where, broadly put, a construction claim is a demand for an additional cost, compensation, or an extension of time by a contractor due to unforeseen circumstances or changes. With effective claims management processes in place, such claims are dealt with to minimize impacts on project operations and schedules. The claims management involves the following steps: Identification, Notification, Documentation, Preparation, Submission, Negotiation and Resolution.

The importance of claims management process in construction cannot be overstated since a claims process properly managed will discourage project delays and cost overruns, enable the works to complete on time and within budget and, more likely decreases the risk of project disputes rising to costly and time-consuming litigation.

The thesis examined the international practices of claim management processes in construction field from the macro level by referring to international standards for claim management, which are constructed by international authorities, towards the micro level of claim management which has been adopted and constantly renewed according to the Egyptian experts' point of view in the market. It addressed the first research objective by reviewing international standards and methodologies, the study identifies the best practices in claim management, highlighting the mechanisms that various countries and companies use to address construction claims effectively. It also explores the adoption of these practices by investigating different studies, industry reports, and expert opinions, illustrating how successful claim management systems are tailored to meet specific project needs and cultural contexts.

The study then examines the challenges faced by contractors in the Egyptian construction industry and tackles the remaining research objectives by conducting a questionnaire among claims experts in the Egyptian market and compares these with global practices to identify gaps and areas for improvement, it also emphasizes that international recognised practices need to be tailored locally for the whole process of claim management to be efficient, fair and conducive to project success.

The findings demonstrated compelling shortcomings within the claims management processes of the Egyptian construction industry, illustrating the need for immediate improvement. The effect of poor communication is a major issue in the Egyptian market, especially in large companies, which leads to delays and mismanagement of claims. Due to this lacking, many claims could be unidentified, not notified, or even not submitted which eventually results in additional costs on the contractor and affects the project performance. It is therefore essential to have strong communication and management tools that optimise project management to ensure better coordination among project teams.

Moreover, lack of documentation was confirmed as a critical challenge across the project lifecycle, including outdated practices and not recording verbal instructions which was also identified as a contributing factor to inefficiency and errors. Therefore, implementing digital documentation systems and standard forms like Confirmation of Verbal Instructions (CVI) is essential to enhance accuracy and accountability.

The mutual agreement on clearer contractual provisions regarding notification time bars, claiming procedures, and dispute resolution processes can reduce conflicts and misunderstandings, whereas promoting the benefits and procedures of alternative dispute resolution (ADR) methods by organizations specialized in those methods is also essential to encourage their use, providing more cost-effective and timely dispute resolution options.

The author finally gave recommendations based on the findings of the study which should be implemented by different types of organizations to enhance the overall performance of the Claims management processes in the Egyptian market, these recommendations address the final research objective for the study and they include implementing digital documentation systems, standard forms like CVI, and specialized software for claims and documentation management. By addressing these issues and implementing the recommended improvements, the Egyptian construction industry can better align with international standards.

Through this comprehensive analysis, the thesis provides valuable insights and recommendations for enhancing claim management processes in the construction industry especially in Egypt, contributing to more effective dispute resolution and improved project outcomes.

Declaration of Authorship

I hereby declare that the attached Master's thesis was completed independently and without the prohibited assistance of third parties, and that no sources or assistance were used other than those listed. All passages whose content or wording originates from another publication have been marked as such. Neither this thesis nor any variant of it has previously been submitted to an examining authority or published.

Berlin, 5/7/2024

Location, Date

Fady Hatem

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Appendix

Study Questionnaire

Construction Claims Management Processes Challenges: A study on the Egyptian Market

This survey is a part of Fady Fakhereldin's master thesis in Construction Claims Management Practices in the Egyptian Construction Industry. The survey aims to gather information from experienced individuals in the construction industry regarding various processes of claims management, including the identification, notification, documentation, preparation, and submission of construction claims in the Egyptian Market.
Your responses will help identify trends, best practices, and areas for improvement in managing claims effectively within construction contracts.

The survey should take approximately 6 minutes to complete. Your responses will remain confidential and will be used solely for research purposes.

Thank you in advance for your participation. Your input is essential and highly appreciated.

* Indicates required question

Personal Information

1. Name:

2. Position/Role: *

3. How many years of experience do you have in the construction industry? *

Mark only one oval.

- ◯ Less than 1 year of experience
- ◯ 1-5 years of experience
- ◯ 5-10 years of experience
- ◯ 10+ years of experience

4. How frequently do you deal with claims management in construction contracts? *

Mark only one oval.

- ◯ Never
- ◯ Rarely
- ◯ Sometimes
- ◯ Often
- ◯ Always

Organization Information

5. Company/Organization Name (Optional):

_____

6. What is the size of your organization? *

Mark only one oval.

- ◯ 1-50 Employees
- ◯ 50-250 Employees
- ◯ 250-1000 Employees
- ◯ 1000+ Employees

7. What is the typical role of your organization/entity in a construction project? *

Mark only one oval.

- ◯ Owner/Developer
- ◯ Contractor
- ◯ Engineering Firm/Architect
- ◯ Project Management Firm
- ◯ Facility Management/Service Provider
- ◯ Freelancer
- ◯ Other: _____

Claim Identification Process

8. How often do you encounter issues with claim identification in your organization? *

Mark only one oval.

- ◯ Never
- ◯ Rarely
- ◯ Sometimes
- ◯ Often
- ◯ Always

9. How would you rate the awareness of project team members in your organization regarding their role in the claim identification process? *

Mark only one oval.

- Fully Unaware
- Unaware
- Neutral
- Aware
- Fully Aware

10. To what extent do you agree that the following issues are negatively affecting the claim identification process in your organization? *

Mark only one oval per row.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Inefficient site management					
Site/Claims team's high workload					
Unclear roles/procedures for the claim identification process					
Poor communication between site team and claims team					
Lack of awareness from site staff to send a contractual notice					
Inadequate documentation of events					
Lack of expertise from site staff in contractual matters					
Inaccessibility of documents to identify claims					

identify claims
identify claims

Claim Notification Process

11. How often do you face delays in notifying relevant parties about claims? *

Mark only one oval.

- Never
- Rarely
- Sometimes
- Often
- Always

12. How would you rate the awareness of project team members in your organization regarding their role in the claim notification process? *

Mark only one oval.

- Fully Unaware
- Unaware
- Neutral
- Aware
- Fully Aware

13. What technology or software does your organization use to manage the claim notification process? *

Mark only one oval.

- ◯ None
- ◯ Project management software
- ◯ Document management systems
- ◯ Specialized claims management software
- ◯ Email and communication tools
- ◯ Other: _____

14. To what extent do you agree that the following issues are negatively affecting the claim notification process in your organization? *

Mark only one oval per row.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Contractual time bar for notification is inadequate	◯	◯	◯	◯	◯
Inaccessibility of supporting documents	◯	◯	◯	◯	◯
Unclear roles/procedures for the claim notification process	◯	◯	◯	◯	◯
Poor communication between site team and claims team	◯	◯	◯	◯	◯
Lack of standard form for notifications	◯	◯	◯	◯	◯
Team's high workload	◯	◯	◯	◯	◯
Inadequate understanding of notification requirements	◯	◯	◯	◯	◯

Documentation Process

15. How frequently do you encounter challenges in the project documentation process in your organization? *

Mark only one oval.

- ◯ Never
- ◯ Rarely
- ◯ Sometimes
- ◯ Often
- ◯ Always

16. How would you rate the awareness of the project team members in your organization regarding the importance of proper documentation? *

Mark only one oval.

- ◯ Fully Unaware
- ◯ Unaware
- ◯ Neutral
- ◯ Aware
- ◯ Fully Aware

17. What tools or systems does your organization use to manage claim documentation? *

Mark only one oval.

- ◯ Paper-based filing systems
- ◯ Project management software
- ◯ Document management systems
- ◯ Spreadsheets
- ◯ Specialized claims management software
- ◯ Other: _____

18. In your opinion, how effective are your organization's current tools and processes for managing claim documentation? *

Mark only one oval.

- ◯ Very Ineffective
- ◯ Inneffective
- ◯ Neutral
- ◯ Effective
- ◯ Very Effective

19. To what extent do you agree that the following issues are negatively affecting the documentation process in your organization? *

Mark only one oval per row.

	Strongly Disagree	Strongly	Neutral	Agree	Strongly Agree
Lack of digitalized documentation system	◯	◯	◯	◯	◯
Inaccurate recorded data	◯	◯	◯	◯	◯
Ineffective recording techniques	◯	◯	◯	◯	◯
Lack of documenting verbal instructions	◯	◯	◯	◯	◯
Inaccessibility of documents	◯	◯	◯	◯	◯
Lack of standard forms to record construction data	◯	◯	◯	◯	◯

20. What improvements would you suggest to enhance the documentation process in your organization? *

Check all that apply.

- [ ] Better documentation practices
- [ ] Improved communication channels
- [ ] Raise site team awareness
- [ ] Standardized procedures
- [ ] Implement training problems
- [ ] Other: _____

Claim Preparation Process

21. How frequently do you encounter challenges in the claim preparation process in your organization? *

Mark only one oval.

- ◯ Never
- ◯ Rarely
- ◯ Sometimes
- ◯ Often
- ◯ Always

22. What resources or expertise do you find most lacking in your organization for claim preparation and estimation? *

Mark only one oval.

- ◯ Legal expertise
- ◯ Financial expertise
- ◯ Technical expertise
- ◯ Data analysis skills
- ◯ None
- ◯ Other: _____

23. To what extent do you agree that the following issues are negatively affecting the claim preparation process in your organization? *

Mark only one oval per row.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Claims team's high workload	◯	◯	◯	◯	◯
Unclear roles/procedures for the claim evaluation process	◯	◯	◯	◯	◯
Poor communication to gather the required information	◯	◯	◯	◯	◯
Lack of standard formulas to evaluate impacts	◯	◯	◯	◯	◯
Lack of software/tools to facilitate evaluation	◯	◯	◯	◯	◯
Inaccurate/unavilable recorded data	◯	◯	◯	◯	◯
Ambiguity of contract provisions	◯	◯	◯	◯	◯
Multiple stakeholders involvement	◯	◯	◯	◯	◯

Claim Submission

24. How frequently do you experience delays in submitting claims to relevant parties? *

Mark only one oval.

- Never
- Rarely
- Sometimes
- Often
- Always

25. In your opinion, how effective is your organization's current claim submission process? *

Mark only one oval.

- Very Ineffective
- Ineffective
- Neutral
- Effective
- Very Effective

26. To what extent do you agree that the following issues are negatively affecting the claim submission process in your organization? *

Mark only one oval per row.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Inaccessibility of documents					
Lack of standard form for claims					
Unclear roles/procedures for the claim preparation and submission					
Lack of competent staff in preparing a claim submission					
Poor communication between teams in claim submission					
Contractual time bar for claim submission is inadequate					
Fear of relationship damage with the owner					

Claim Negotiation Process

27. In your opinion, how successful is your organization in claims negotiation process? *

Mark only one oval.

- Very Unsuccessful
- Unsuccessful
- Neutral
- Successful
- Very Successful

28. To what extent do you agree that the following issues are negatively affecting the claim negotiation process in your organization? *

Mark only one oval per row.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Poor negotiation skills					
Disagreement arising during negotiation					
Unsatisfactory supporting documents					
Negotiation duration is insufficient					
Compromising to avoid relationship damage					
Insufficient preparation					
Rigid and inflexible positions					
Lack of transparency					

General Feedback

29. Are there any other information you would like to share regarding any strategies or best practices that can be implemented to overcome challenges in the claim management process?

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