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**INVESTIGATION ON REASONS OF LATE
COMPLETION OF CONSTRUCTION PROJECTS**

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Master's Thesis

Supervisor

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ABSTRACT

INVESTIGATION ON REASONS OF LATE COMPLETION OF CONSTRUCTION PROJECTS

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Unanticipated construction delays are inevitable, as is the case with most things. Confusion and a lack of communication are the most frequent causes of this delay. The majority of contractors anticipate the additional time they'll lose and include it into their overall schedule to prevent this from occurring. Consequently, the first step in managing time effectively is determining how well each part of the project should be controlled. In construction projects, project objectives are based on a succession of resource-constrained operations. Stakeholders and financial resources will always be bound by the scope, cost, timeline, and quality objectives of a project. Identify the fundamental reason of any delays before beginning a project so that you may make informed decisions or generate new options. When construction projects are delayed, time and money are wasted, which has a detrimental impact on both the project participants and the economy. A delay should be addressed immediately in order to determine who is at fault. There are four levels of conflict, ranging from arbitration to an appeal to a claim to a dispute that spirals out of control and may put the project on hold.

Keywords: Investigation, Late Completion, Construction Projects, Reasons, Project Management.

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ABBREVIATIONS

CAD	:	Construction Activity Delays
CCD	:	Change Order Delays
CSD	:	Construction Schedule Delays
CTD	:	Contractor Time Delays
DLD	:	Design Late Delivery
DND	:	Design Not Delivered
ESD	:	Environmental Delays
HSD	:	Human Resources Shortage Delays
LCCP	:	Late Completion of Construction Projects
MSD	:	Machinery and Equipment Shortage Delays
OAD	:	Owner Approval Delays
PBD	:	Poor Bid Documents
PMS	:	Project Management Slippages
PRD	:	Project Resource Delays
RLC	:	Reasons for Late Completion
SCD	:	Site Condition Delays
SMD	:	Supply Material Delays
SPD	:	Subcontractor Performance Delays
TPD	:	Technical Problems Delays
UWD	:	Unforeseen Weather Delays

1. INTRODUCTION

1.1 INTRODUCTION

As is the case with most things, an unplanned delay on a construction area is unavoidable. Numerous causes contribute to this delay, but the two most prevalent are confusion and a lack of communication. To avoid this, most contractors assess the additional time that will be wasted and incorporate it into the overall time schedule prepared. Thus, one must first determine how well each part of the work should be handled to maintain control over time. In construction projects, the set of objectives to be fulfilled is dependent on the execution of a sequence of operations that are resource constrained.

There are always potential conflicts between stated objectives about scope, cost, time, and quality and the limits imposed on people and financial resources. After determining which element is causing the delay, these problems can be accurately assessed and resolved prior to the start of a project to make appropriate choices or developing new alternatives.

1.2 RESEARCH PROBLEM

Delays in construction projects result in significant time and expense losses, which affect not only the project participants but also the country's economy. As a result, once a delay arises, it should be addressed very early to discover who is to blame. There are four degrees of conflict that occur, starting with arbitration, which may lead to an appeal, which may lead to a claim, and finishing in a dispute that could spiral out of control, potentially halting the entire project.

1.3 IMPORTANCE OF RESEARCH

Delays are unavoidable in the construction industry. This has an impact on the project's objectives, which has a detrimental impact on all project participants in terms of cost, quality, and timeliness. There are several elements that influence this industry, based on the conditions and circumstances in each location, as well as those that have an economic impact on the country and hence result in money and effort losses.

Finding the common elements in Iraq that cause these delays in marked is essential if we are to discover a solution that minimizes time and money loss while also adopting a method to be used in building projects. As a result, construction project management functions typically involve the following:

- a. Define project goals and plans, such as scope, budgeting, scheduling, and performance requirements, as well as project participants.
- b. Creating exchange partners and dispute procedures among the numerous players.
- c. Multiple operations, including as planning, design, budgeting, contracting, and construction, are coordinated and controlled throughout the process.
- d. Acquisition of labor, resources, and equipment in accordance with a predefined schedule and plan to improve resource efficiency.

1.4 RESEARCH QUESTIONS & HYPOTHESIS

This study focuses solely on three questions. What are the advantages and disadvantages of the Iraqi construction management style? Are they held to a set of criteria and tested using scientific methods? How can we close the gaps in Iraq's construction industry? These are the study's three primary questions, upon which researcher will focus to find answers, as well as throw light on some past studies in addition to data gathered through the disseminated questionnaires.

Hypothesis Project management is focused on eight main variables that every project manager must be aware of and pay attention to:

- a. Project integration management, which ensures that all project parts are well-coordinated. Is it possible to work as a contractor in Iraq's building industry?
- b. Scope of work and records control to ensure that all required work (and only required work) is specified in the agreement from the start.
- c. Project managing time to ensure that the project is completed on time. Are the schedules realistic in terms of resource availability? Is there an adequate and regular update?

- d. Cost planning to identify required resources and keep a tight grip on the budget. Is there enough money in the bank? Is it true that payments are made on time?
- e. Human resource management for project staff development and effective employment. Are they as effective as they should be in their jobs?
- f. Quality assurance for the project to guarantee that all functional and technical needs are fulfilled. Which of the main resource types is of higher quality
- g. Management of project communications is number seven. Is it to ensure that externally and internally communications are effective?
- h. Evaluate and prevent threats via project risk management. Is the choice part of the scientific risk analysis method?

All eight possibilities should be thoroughly investigated in order to identify the flaws in Iraq's management system.

1.5 SCOPE AND OBJECTIVES

The purpose of this study is to provide methods that will aid in the timely and cost-effective completion of construction projects. As a result, the goal will be broken into four parts:

- a. Goal 1: To advertise and implement the advantages of the existing knowledge triangle adjustments (contractor, owner, and consultant). The disagreement between these three parties should be resolved from the beginning of a project by making the required choices or developing new alternatives to identify who is to blame for the delay.
- b. Goal 2: Using an opinion survey and prior studies, identify the key causes of time in building construction projects in Iraq.
- c. Goal 3: Determine the three key stakeholders' opinions of the time overrun and propose solutions for eliminating or reducing them.
- d. Goal 4: To thoroughly understand the instruments of time management and to improve them to be more effective.

1.6 THEORETICAL BACKGROUND

The construction activity entails several processes. From the beginning until the end of the event, it contains a varied variety of experiences and participants. To ensure effective completion of a construction project, the activities necessary, as well as the roles and duties of the project manager, architectural engineers, constructors, builders, and subcontractor, can be arranged in a variety of ways. Despite the numerous options, completing a major construction program task without encountering schedule and cost overruns is more often the exception than the rule. While a multitude of factors might contribute to weak results, there are two key success factors to remember. Effectively and efficiently providers to manage, resources, and change.

Each participant in the construction phase, from the lender through the owner, architect, engineer, contractor, and subcontract, as well as those that can provide funding and health insurance, values time, and its associated costs. By effectively managing and administering contract require new clauses, significant time and expense overruns can be prevented and managed. To maximize the possibility of a particular project conclusion, members in the construction procedure must have a fundamental understanding of the following:

- a. It is important to understand critical path scheduling methodologies as well as the accompanying planning demands, and software employed.
- b. The frequency with which delays occur and the process through which they occur.
- c. The advantages and disadvantages of several timeline and delay management approaches utilized by project team members and professionals, as well as their application.
- d. The concepts that serve as the foundation for any constructive strategy to scheduled and delay analysis, including

Time management may be costly, time consuming, and fraught with uncertainty. Excessively complex scheduling specifications, the contractor's construction brokering, errors and omissions, shifting site conditions, user modifications, and insufficient time extensions are all elements that could hinder project delivery. Reserved of rights for delays, cumulative consequences, and failure to consider realistic completion date waivers can all worsen these problems.

Consequently, there is a significant lot of ambiguity and miscommunication regarding what constitutes and does not constitute appropriate proof requirements for excusable and sanctionable offenses. While computing and computer programs greatly increased the likelihood of better in case skills, they also contributed to several user quality difficulties. The problem is usually compounded by both the Owner and the Contractor's failure to recognize the critical role of rapid delay management and the need of keeping a current schedule by accurately representing genuine findings and delays as they occur.

1.7 EXPLAINING AND SHOWING A DELAY

Whenever a particular delay happens or is asserted by the contractor, the client or its agent (PM, CM, or A/E) must pay close attention and respond quickly. The owner must swiftly identify who is to blame for the suspension (A/E, Owner, or Contractor) and establish and apply a remedial action plan as soon as possible. This necessitates the development of an effective technique of investigation for providing a timely and impartial evaluation of modifications and delays, as well as the formulation of a clear, brief, and convincing position on each. The contract's specific terms must be followed. Furthermore, the owner should demand that its representative implement basic delay analysis concepts utilizing sound methodology, such as Time Impact Analysis (TIA) processes. A basic working knowledge and comprehension of applicable legal precedent for timetable and delay, and also addressing any concerns with the completion of the project, is also required of the owner or its representative. It is also necessary to create field processes that necessitate the isolation, identification, and recording of real information relevant to the delay and impact costs.

1.8 CREATING THE REQUIRED PROCESSES AND CONTROLS

- a. Establish contract terms and project procedures that clearly define the requirements for project planning, implementation, and control.
- b. A claims prevention and reduction system was designed and aimed toward risk management to assist in the prevention, mitigation, and prompt resolution of potential disputes, especially those involving schedule and expense overruns. A good claim avoidance and mitigation strategy should include the following elements:

- i. A evaluation of the contractual agreements to find possible types of concern and how to best manage and resolve them, as well as to ensure that important claims prevention clauses and processes are included in the contract terms.
 - ii. Educating employees on the procedures in place and the areas where claims are most likely to occur, as well as developing early warning systems, developing consistency in replying to prospective claim impacts, and recommending techniques for preventing, recognizing, analyzing, mitigating, and successfully resolving claims.
 - iii. A complaints surveillance program to evaluate the effectiveness of the avoiding and dispute settlement process on a regular basis.
 - iv. A regular reporting mechanism to keep the development team and leadership informed, as well as to guarantee that all stakeholders are on the same page about the approach, activities, timeline, and outcomes.
 - v. On a case-by-case basis, a periodic leadership briefing sought to address the most pressing concerns.
- c. Understand the project delivery system's strengths and shortcomings, as well as the obligations, roles, and responsibilities adopted or ignored by involved parties.
 - d. Become familiar with the important contract conditions that could lead to conflicts, schedule delays, and cost overruns.
 - e. Create and update a real-time summary entitlement analysis.

1.9 ORGANIZING AND MANAGING THE TIMING

Scheduling approaches have made it much easier to demonstrate the delay impact that can arise as a result of difficulties and unanticipated project events with acceptable certainty. Concurrent delays can be reliably separated by identifying, isolating, and quantifying delays. This capability has greatly aided the legal significance of the project timetable. While scheduling approaches do not in and of themselves constitute proof, their use can be useful in demonstrating culpability and causation. They can also provide a reasonable and

supportable foundation for distributing or apportioning damages, which is preferable to guesswork or other methods.

It's also crucial to comprehend the basic rights that both the owner as well as the contractor have as a result of the contractual relationship. For examples, the operator has the authority to set the time limit for performance. He even has the right to anticipate prompt delivery and to contract for monetary damages if delivery is delayed. He may even reach agreements that limit the remedies available to contractors.

Certain rights are also granted to the contractor. He has the right to fair accessibility to workplaces, timely approvals, timely delivery of owner-supplied tools and components, and rapid payment, for example. He does have the right to finish early and to demand extra time and money for delays created by the owner, depending on the conditions. As construction professionals, we must grasp not just scheduling methodologies and how to put them into practice, but also how a project schedule can be used to define the legal responsibilities, obligations, and warranties arising from the schedule.

1.10 USE TIME IMPACT PROCESSES TO BE PREVENTATIVE

Plans, estimates, and timetables will all be affected by inaccuracies, owner changes, unforeseen subsurface conditions, and strikes, among other things. These are just a few of the reasons why you might want to rearrange your schedule. It is for these reasons that the timetable needs to be reviewed and revised on a frequent basis, as well as the contractor's most up-to-date plans and objectives.

In time estimate, Time Impact Analysis (TIA) is a tactic that makes use of networking techniques (dragnets) in order to highlight the impact of specific delays on the project timeline as they happen. A dragnet is a sequence of additional activities or network revisions that are meant to be added to the existing schedule in order to demonstrate the repercussions of delays and the strategy for dealing with them as they occur. It is necessary to identify, isolate, and quantify the time effect of a single issue on previous or current delays. Time Impact Analysis can be applied to a project either prospectively or retroactively, depending on the circumstances.

For the Apollo Space Program, the Time Impact Analysis (TIA) method was created in the 1960s (Launch Complex 39). In this way, both the owner and the contractor can quickly see which processes and critical paths are hampered. When conducting a TIA, keep the following factors in mind: the timeliness of the delay; the source and effect of any concurrent delays on project completion; and the impact of any concurrent delays on the project completion date (if any). Processes such as TIA allow two contractual parties to independently assess the effects of an occurrence or issue that results in a delay. The use of a shared framework to compare allows parties to discuss and come to an agreement on the degree of delay and time effect that will be experienced. By utilizing TIA techniques, each party can demonstrate its understanding of a certain delay as well as the scheduling proofs that have been provided vs. However, even in the event of a failure to reach an agreement, attempts can offer a clear record of any arguments that are documented by meeting or negotiation records. A TIA can be used both throughout the project and as a post-project analysis tool if issues remain unresolved at the conclusion of the project. Building construction is a significant company, both in terms of goods and in terms of money, issues, and claims, according to Hank Kaiser, the creator of Federal Publications. Essentially, construction workers must be well-versed in their field in order to avoid making costly mistakes and to empower themselves with defensive knowledge. This is especially true when it comes to dealing with time and change issues for any type of delivery.

1.11 THE RESPONSIBILITIES OF MANAGERS

Managers have a variety of specialized responsibilities that they have either studied or practiced, and they must be well-versed in these roles in order to control construction project delays.

- a. Receive early notification of delays caused by the client, the main contractor, or your employees. Client delays occur when clients change their minds, deliver their instructions late, or take a long time to approve drawings, among other things. They frequently disregard the reality that these delays push the start date for "E&M" contractors, and that the contractor has little control over the situation. The most common cause of main contractor delays is incomplete construction work that prevents later installations, such as heavy equipment installation, from moving forward. Bad management and a lack of cooperation can cause delays in some circumstances. Last but

not least, the "E&M" contractor may cause delays some under the project in the early stages or failing to complete and acquire authorized design drawings on time.

- b. Ascertain that the client is aware of the reason for the delay. Clients remember just what they want to remember. They must recognize that there is a knock-on effect when they make design changes, deliver late instructions, or take a long time to approve designs. Time is money, and it is usually the contractor's money until the customer understands the impact of their actions on the project's stages and critical route completion. Use terms like "Mr. Client, I am pleased to execute these modifications, but I must emphasize that we will need to reorder equipment and obtain approvals, both of which will take time," and then get it in writing.
- c. Set a time limit on design changes to account for supplier lead times, approvals, and other factors. When a deadline is set, such as when a sports complex must open by a certain date. There is a "No More Changes Point." Too often, the subcontractor is held responsible as "very Last Man Standing"; don't fall into this trap.
- d. Carefully monitor the work of the previous contractor or contractors, and ensure that delays outside your management are identified and documented. Delays that are beyond your control and have a financial impact must be documented and dealt with either the appropriate accountable person. Remember, you shouldn't have to pay for other people's delays, and you shouldn't be held responsible for them.
- e. Stay updated on what the team is doing that could cause delays, such as starting late, submitting drawings late, or making errors in your drawings. That we're at fault, we must accept the consequences and work to rectify the delays and recoup the costs. Remember that if we are honest regarding our mistakes, people are more likely to believe our assertions when they are not our fault.
- f. "Mitigate" the delays by speeding up work, using up your "float," and redefining the Critical Path. Whatever the source of the delay, we must endeavor to reclaim our position; after all, if a vital deadline is missed, the client may not care who is to blame.

1.12 PROBLEMS TO BE RESOLVED PRIOR TO THE START OF CONSTRUCTION

- a. Recognize the extent of each party's duties and relationships with the other parties. Permit authorities and utility services, for example, bear a significant share of the blame for project delays despite the fact that they have no direct contractual relationship with the project's participants. One of the most important risk management steps is to map out those connections and connect their scope to critical project milestones. An often-overlooked mitigation method is engaging in active communication with the entities under consideration. Depending on the agreement, there may have been provisions for compensating for delays imposed by third parties.
- b. Realize the importance of the transaction. Notification needs should be clearly established, with visible consequences for non-compliance, such like payment withholding, because of non-compliance. Change management approaches make it possible to manage range expansion while also resolving schedule and cost issues. According to the lessons learned from numerous project failures, poor development management was a primary cause of unresolved arguments, which resulted in a protracted and expensive resolution process that was ultimately unsuccessful.
- c. Analyze the most important path. Scheduling assessment tools can highlight areas where task durations are unreasonable or disconnected (due to a lack of exact rationale) from other activities. A reliable timetable is vital for keeping project timelines under management throughout construction and, if necessary, rigorously in the event of a dispute. As a result, early examination of a Level 1 schedule may result in adjustments to procurement processes or the timing of critical tasks in order to decrease risk and develop cost-effective mitigation measures.
- d. To provide as little more than a monitoring system, set up safety indicators. Without precise action plans for major project planning risks, conducting a successful risk assessment and identification process is impossible. The most implementation and control plans are those that are connected to project controls that are already under the project team's oversight and hence most effective. After constructing a threat project control measure, it can be analyzed for risk triggers, which indicate when a risk is about

to manifest itself and have an influence on the project. As a result of active monitoring and communication of these risk triggers through dashboard reporting, the entire project team can be made aware of the risk status before it manifests itself. In contrast with damage control, proactive mitigation is possible with this method.

- e. Concurrent documentation should be written up in order to analyze how much time has passed and how much productivity has been lost. Another benefit of connecting risk action plans to project controls is that it allows you to detect and quantify delays and productivity loss in real time, which is quite beneficial. As a result, rather than filing a claim, unplanned delays and disruptions can be remedied with a change. This can be performed in the case of contractors by giving notice of an effect and establishing the costs or scale of the effect using current information. Owners must have a realistic method for analyzing the agreement limit and even the contractor's possible losses because of this (or at least claims). Credible actual papers will, at the very least, assist in reducing the argument to those concerns that are within the scope of the claim when it comes to showing the harm or loss.

A construction risk management. Threat handling requires the participation of all project stakeholders. This involves proactive risk management for delays and interruptions, which is addressed in part by the solutions under consideration. While the precautions listed above may not be sufficient to completely prevent delays and interruption claims, they can often aid in the speeding up of the settlement process in many situations.

1.13 SYSTEM FOR MANAGING DELAYS

a. Techniques for Retrospective Delay Analysis

Four retrospective delay analysis approaches are used to in the Society of Building Law Delay and Disturbance Protocol to compute the extra time for the delay, as follows:

- i. As-Built vs. As-Planned : This method evaluates the time of an As-planned activity (or all As-planned operations) on the original system to the duration of the same action (or those operations) on the As-built program.
- ii. Impacted As-Planned: This system utilizes an identified explainable delay event (or occurrences) into the As-planned program, whether as a separate process (or activities)

or as an addition to the time of a respect to the operation (or activities). The time of the activity is obtained (to the extent possible) from the As-planned program's resource allowances.

- iii. Collapsed As-Built: This process includes subtracting specified excusable delays from of the As-built program to determine what the Target Date would be if certain delay events still hadn't occurred.
- iv. Analyze the Impact of Time: Window overview (also relative time Slice study) and Snapshot analysis are two different types of time impact analysis. We will not discuss Snapshot Analysis in this article because it is only employed in the scenario of concurrent Extension of Time grants. Instead, we will discuss the Window Analysis approach.

b. Tools and methodologies for dealing with delays

There are various tools and procedures established to manage construction projects and avoid delays as much as possible. Contractor Scheduling uses the following tools and techniques to identify the upcoming points:

- i. How does the Owner/Contractor know how a delay affects time if there isn't a schedule?
- ii. Initial Schedule
- iii. Updates to the Schedule
- iv. Float
- v. Contractor's scheduled end date
- vi. Substantial completion
- vii. Contract end date

1.14 METHODOLOGY

The subjective data was gathered through a literature review to assess the project's success, while the quantitative data was gathered using a questionnaire survey. The latter was

examined using the average index method, and the results will be presented in chapter four. This questionnaire was issued to thirty multiple companies in the Khartoum sector, including contractors and consultants, and this analysis was applied to both at the same time.

This study was based on references that discussed how building project delays should be addressed. The Net also was a valuable resource in this study, providing a wealth of material. The purpose of the questionnaire was to collect vital information and details that would aid in the development of a strong conclusion. In addition, interviewing and collecting the thoughts of industry experts was extremely valuable to this project. All of these techniques will be collected and examined using choice study to analyze where the delay will be placed, after which their values will be evaluated in the proposal delay module. At the conclusion of this study, optimal solutions are selected as suggestions.

The investigation was conducted using a questionnaire. The survey was broken down into seven sections. The first section contains fundamental inquiries and background information about the project, while the next sections go over each aspect that contributes to the delay, which are divided into categories including such engineering, material, and so on. Project engineers, mid-level staff, and contractors were interviewed by the researcher. It came up with a quick outline of the delay factors in order to identify the primary culprits in Iraq, and afterwards began focusing on each and every factor of delay independently.

1.15 THESIS OVERVIEW

Chapter one: Introduction

Chapter Two: Literature Review for the Thesis

Chapter Three: Methodology

Chapter Four: Result

Chapter Five: Discussion of the Thesis and Future Research

2. LITERATURE REVIEW

2.1 OVERVIEW

The process of building is very complicated. It includes a lot of different things and people from the start of planning to the end of the project. The owner, the architect, the engineer, the construction manager, the contractors, and the subcontractors can work together in many ways to complete a construction project. Even though there are so many ways to build a big project these days, it's very rare that it doesn't have to be delayed or cost more than expected. These poor results could be caused by a lot of different things. Two of the most important are effectively managing time and resources, as well as changing things up.

Meaning: A delay is a time when a project is late that is agreed to in a contract and something that is slower than that of the date that contractor and the client agreed on for the project to be done. It is a project that runs late and is well-planned, which is a common thing in the building projects. The project holder sees a delay as a loss of money because there aren't enough manufacturing services or rentable space, or because the project is still relying on the same services that were used before. Another example: Delays cost more money for the project manager or contractor due to the obvious longer work period and the late submission of the project, higher costs for materials because of rising prices, and more costs for people because they took longer than they were supposed to.

Construction Projects: Projects in the construction field who have a set time frame, a set number of resources, and a set goal are called construction projects. Three rules have been followed in needed to finalize construction works.:

- a. The construction project's cost should be efficient.
- b. The construction projects should be completed on time.
- c. Project quality (Quality) is required: Effectiveness must satisfy all of the requirements and specs. Are the parts of a research work.:
 - i. Finance and investment are necessary to complete the project.
 - ii. Quality: the desired level of quality and its breadth, as well as clear requirements.

- iii. Quantities: the project's scope.
- iv. Time: how long and when the construction will be completed.

Many studies and research initiatives have been completed to investigate the reasons for building project delays; both local and global research has been analyzed.

2.2 CONCEPTUAL BASE

They need to know how long and how much money it will take them to finish their project. This means that everyone who is part of the design process should be aware of this information. To avoid and reduce long-term overruns in time and money, it's important to make sure that the contract time and change provisions are being properly managed and enforced. The more people who are involved in the construction process know about these things, the better their chances of having a successful project are.

- a. Techniques for critical route scheduling, as well as the associated scheduling standards and software, are also covered.
- b. Delay and the way it happens.
- c. The benefits and drawbacks of different ways stakeholders and specialists have been starting to plan and delaying work are talked about.
- d. This section contains the fundamental concepts of any successful schedule and schedule analysis approach.

Time management may be costly, tense, and prone to a lot of uncertainty. Key issues influencing effective project delivery include extremely complex planning requirements, construction trying to negotiate by the contractor, omissions, varying site circumstances and user modifications, and inadequate project extensions. Complicating things are reservations of privileges for wait time, likely repercussions, and not paying attention to possible closure date exclusions.

A lot of things are still ambiguous or mistaken about how to show that a delay or even an impact was caused by a legitimate reason. Many scheduling issues have arisen because of greater use of computers and scheduling software. If both the contracting parties don't realize

this early on, it can make it much more difficult for them to keep their schedules up-to-date and resolve delays as soon as they occur.

Rumane (2010), defined the inspection as “a specific examination, testing, and formal evaluation exercise and overall appraisal of a process, product, or service to ascertain if it conforms to established requirements”. This stage started in the 1910s when the Ford Motor Company employed teams of inspectors to check the quality of its T-model car. The purpose of the inspection was the detection of poor quality products and separate them from the acceptable quality product.

Deming (1986) stated that “inspection with the aim of finding bad product and throwing them out is too late, ineffective and costly” because the inspection resulted in wastages that add costs which are reflected in the price paid by the customer.

2.3 DEMONSTRATING AND JUSTIFYING A DELAYED

If there is a specific delay that the contractor is mostly to blame for, the owner, or their representative (such as a CM, PM, or A/E) must pay special attention as well as quickly respond. It is imperative that the owner ascertain who is to blame for the delays (Contractor, Owner, or A/E) and devise and implement a solution as soon as possible.

An effective way to ask questions must be set up so that changes and delays can be assessed quickly and objectively, and a clear, concise, and convincing position can be taken for each. The terms of the contract must be obeyed. In order for the owner to make sure that its representative is following the basic principles of delay analysis, he or she should use a strong method, like the Time Impact Analysis (TIA) procedures. It's important for the project's owners and their representatives to know how the law works when it comes to timetables and delays, as well as any issues with the project's date of completion. In furthermore, field processes that involve the identification, separation, and collection of real data about delays and their costs should start now.

2.4 MAKING THE REQUIRED PROCESSES AND CONTROLS

- a. Provide contract terms and project procedures that clearly define the criteria for planning, implementing, and controlling the project, and that are consistent with the project's overall objectives.
- b. Establishing a claims control and prevention system that considers risk management is recommended. This includes everyone who deal to project cost and schedule overruns, as well as those who negotiate with claims. A good claims alleviation and avoidance scheme has the following parts:
 - i. To look over the service contracts to see where there might be risks and how to deal with them; to make sure that important measures and processes for preventing claims are in the contract terms.
 - ii. Employees need to be taught how to set up early warning systems, react consistently to possible claim consequences, and suggest ways to prevent, recognize, analyze, mitigate, and successfully resolve claims.
 - iii. To monitor the effectiveness of the avoidance and conflict settlement procedure, a claims surveillance apparatus
 - iv. Establishing a system of regular reporting to ensure that everyone involved in the project is aware of the progress being made and that everyone is on the same page regarding the strategy, activities, timeline, and outcomes that have been reached.
 - v. On an as-needed basis, a briefing for senior management to discuss the most pressing concerns.
- c. Know the benefits and drawbacks of the develop - construct method being used, and even the duties, roles, and responsibility that the parties involved in the process have adopted or avoided.
- d. Develop a working knowledge of contract terms that potentially result in disagreements, delays, and budget overruns.
- e. Establish and sustain a real-time authorization analysis.

2.5 MANAGING AND ADMINISTERING TIME

It is now possible to demonstrate with fair confidence the impact of project delays that can happen because of difficulties and unanticipated project events thanks to the advancement of scheduling tools. Delays may be discovered, isolated, and measured, and concurrent delays can be correctly separated from one another using this method. As a result of this potential, the project timetable has gained major legal significance in recent years. However, while scheduling approaches may not usually constitute evidence themselves, their use can be of significant help in demonstrating culpability and causation in a legal proceeding. Furthermore, they can serve as a genuine and maintainable basis for assigning or apportioning damages, which is preferable to relying on guesswork or other improbable methods of determining damages.

As a result, it is important to understand the basic rights that each party has as a result of their contract with each other. Ownership, for example, has the power to set the time frame in which the efficiency must be done. Other rights he has include the reason to assume timely productivity and ability to set up a payment strategy in place of late achievement. Even if he doesn't, he might enter negotiations that limit the contractors' rights.

Besides that, the contractor has a few more rights. In addition, he has the right to be able to get to work areas in a reasonable amount of time, get approvals quickly, get materials and equipment from the owner on time, and get paid quickly. He does have the right to finish early and to ask for more time and money, if the property owner delays the work. As people who construct buildings, we need to know more than just how to use scheduling methods as well as how to try to implement. We also need to know how a planning process can help us figure out who has what rights, obligations, and warranty coverage because of the scheduling system.

Naidu et al., 2008. Deming is regarded as the father of the quality movement and he was the first American who transferred the principles of quality management to Japanese through his seminars that were organized by (JUSE) in 1946 and taught Japanese the concepts and techniques of quality.

Goh, 2000. Deming's philosophy focused on the quality improvement through statistical control and reduction in variation. He classified the causes of variability into 'special' which

are the usual, historical, quantifiable variation in a system and ‘common’ causes which are unusual, not previously observed, non-quantifiable variation. Deming also stated that operational people could eliminate special causes while the elimination of the common causes is relying on the responsibility of management.

In their website article, NEC Contract, 2016, the ‘New Engineering Contract’ explain document deliverables in a contractual context. Employers will normally set submission times for design and construction document deliverables in whichever form of contract is used for Design and Build Contracts. The Contractor will normally develop its design and construction program to show the employer how it will achieve overall completion by the required date. The program would include its planned dates for submission of particulars of design and the period for the Project Manager’s review and acceptance. Deliverable dates should be set by first establishing the objective, then working backwards to the beginning. The Contractor would then set up its subcontracts for its designers to get the deliverables from them in good time to meet its overall design and construction program. There are different ways of setting dates for the submission of deliverables, but normally the scope could simply require each delivery within an indicated number of weeks from the start date of the contract, which could be subject to any compensation events. The possible problem with this is that there isn’t a clear remedy for the designer not to achieve these dates. This may result in the employer suing the designer for ‘breach of contract’ if a designer’s late submissions cause the employer problems.

In their journal article Acıkaraa, et al., 2017, they found that questionnaire results revealed that only almost half of the construction employees attended quality related training and that this was insufficient awareness of the quality requirements for the project. The questions therein were about construction employees’ awareness of quality requirements and procedures, and if not it was it due to lack of training being offered, or due to them not being willing to learn. So, this project will look for these perceived reasons.

This project was used LinkedIn, 2021, as the forum source for data collection by sending an questionnaire form containing the questions to be completed by the recipients, who for the purpose of this study shall be known as ‘respondents’. LinkedIn can be used to strengthen professional relationships and they state that their mission is to ‘connect the world’s professionals to make them more productive and successful’.

2.6 MAKE USE OF TIME IMPACT TECHNIQUES

Plans, projections, and timelines will always vary due to disparities, owner modifications, unknown subsurface conditions, strikes, and actual results. There are a plethora of reasons for reworking the schedule, and these are just a few. When this is the case, the schedule must be regularly updated and amended to reflect current performance and the best intentions of the contractor.

If you want to figure out how much a delay costs, you can use dragnets to show how a specific delay affects the project's schedule as it happens. Dragnets are extra tasks and network changes that are added to the existing schedule in order to show (in both a graphical and statistical form) the consequences and how to deal with delays when they happen. The goal of this process is to figure out and measure the time impact of a certain problem. All on the same project, Time Impact Assessment methodologies can be used both in the future and in the past.

To start with, TIA was used on Apollo Space Program in the 1960s as a contract requirement because it was important for the project to work (Launch Complex 39). Using this method, both the owner and the contractor can see right away which activities and channels of criticality have been affected. The following advice can help you do a TIA well: It is important to think about a delay's cause, duration, impact on the project's completion date, and how to account for it, as well as any lag time that may be available.

This means that two people who are both part of a contract can independently figure out how a delay or other problem will affect them if they both use TIA methods. The parties will be able to negotiate and come to an agreement more easily if they use the same framework for comparing and analyzing the amount of time that has passed and the effect that this has had. There are ways to show that everyone involved is aware of the delays, as well as what evidence they have and what proof they need. A record of meetings or talks can be used to keep track of any disagreements if there isn't a way to agree. TIAs are useful both during the project as a standard guideline and if problems aren't dealt with and there are delays.

Then he said: "Construction is a big business. It makes a lot of money, has a lot of problems, and has a lot of room for lawsuits. It is a very big business." As a result of the high stakes, construction workers must take steps to avoid costly mistakes, learn how to protect

themselves, and become experts in their fields. If you use any delivery method, you can't be more precise about how time and change are managed.

Kondo, (1997), defined quality as a source of employee's empowerment. To him, a major aim of a company is to make itself attractive to its employees and customers while making profits for its shareholders.

George Bernard cited in Stebbing, (1992) noted that two forms of qualities exist in the world, efficiency and inefficiency. To him, efficiency is what every senior manager should strive to achieve and efficiency in service is what the customers expect to get. He explained that organizations are inefficient because of the inadequate trainings given to employees by the employers or the assignment of task to unqualified workers. Which ever way quality is defined, it is viewed as part of an organisational culture; this should be inclusive of all different facets of production.

According to Mohammed (2006), TQM is an effective system for integrating the quality development, quality maintenance and quality improvement efforts of various aspects of a system so as to enable services at most economical level and derive full satisfaction. TQM is aimed at the satisfaction of customers needs in an efficient, reliable and profitable way. It involves a radical direction through which an organisation perform her day to day operations in other to ensure that quality is put at the top of mind of every employee and departments in which they operate. Vorley and Tickle (2001), defined TQM as the synthesis of the organisational, technical and cultural elements of a company. They opined that TQM is a heart and mind philosophy which recognises that company culture affects behaviour which in turn affects quality

Oakland (1989), describes TQM as an approach to improve competitiveness efficiently and flexibility for the whole organisation. According to Hellsten and Klefsjö (2000), TQM can be defined as a management system which consist of interdependent unit namely core values, techniques such as process management, benchmarking customer focused planning or improvement teams and tools such as control charts. Dahlgaurd, Kristensen and Kanji (1999) saw TQM as a corporate culture that is characterised by increased customer satisfaction through continuous improvement involving all employees in the organisation. Oakland (1989), noted that 'for an organization to be truly effective each part of it must work properly

together towards the same goal, recognizing that each person and each activity affects and in turn is affected by each other – the methods and techniques used in TQM can be applied throughout any organization.

2.7 RESPONSIBILITIES OF MANAGEMENT

Building project managers have numerous specialized tasks that they have either studied or obtained via actual experience, and they should know these jobs thoroughly in addition to controlling delays in the construction project. For example, they must:

- a. Make sure you're aware of any delays that could be caused by the client, the primary contractor, or even your own employees. Client delays are caused by the client changing their mind, giving instructions late, or taking too long to approve designs, among other reasons, they tend to miss the reality that "E&M" contractors' start times are pushed back as a result of these delays, and the contractor has no control over them.
- b. A lot of the time, the main contractor's delays are caused by incomplete building work, like not installing heavy machinery. Mismanagement and a poor coordination can lead to long delays in many different situations. If the "E&M" contractor doesn't finish design documents on time, for example, the project could be slowed down in the early stages of the project.
- c. Find out if the client is to blame for a delay and tell them. Clients pick and choose what they remember. When they create design changes, give late directions, or are late in approving designs, there is a chain reaction. Until the client realizes that their actions have an impact on how long it takes to finish the phases of the project as well as the most important path, time is money. Let your customers know that you can make the changes they want if they give you the time to get the resources you need, like reordering equipment and getting approvals, which both take time.
- d. Allow for procurement lead times, permissions, etc. by halting design changes at a specific point. When there is a set deadline, such as the opening of a sports facility on a specific day, it is important to plan beforehand. As time goes on, there is a "Point of No Return." You don't want to be "the Last Man Standing," which happens all too often with subcontractors.

- e. It's important to keep a close eye on the work done by the previous contractor or contractors, and to document any delays that are beyond your control. It's important to keep track of any delays that are beyond of your control and have the financial impact dealt with by the right person. As a reminder, you should not shoulder the burden or be held responsible for other people's delays!
- f. Inspect your team's work for potential delays, such as starting late or submitting designs late or making mistakes in your work. We have to bear the charges and strive to make up for the delays and recoup the fees we incur when we are at fault. Remember that people are more likely to accept our assertions if we are honest about our mistakes.
- g. Mitigate the consequences of delays by speeding up work, exhausting your "float," and redefining your Critical Path. It doesn't matter who is at fault if a vital deadline is missed; the client may not care. We must work hard to regain our position.

2.8 PROBLEMS THAT MUST BE ADDRESSED PRIOR TO THE START OF CONSTRUCTION

- a. Be aware of all the parties involved and their relationships. Non-contractual parties, including such licensing authorities and utility services, are responsible for many project delays since they set schedule objectives and have no contractual arrangement with the construction stakeholders. Key project milestones should be used as a guide when mapping these linkages and their scope. Active communication with these entities is an underappreciated technique for mitigating risk. If a delay is caused by a third-party participant, the contract can include built-in remedies.
- b. Be familiar with the agreement(s). There should be genuine penalties, such as withholding payments, for violations of notice rules. To keep costs and schedules in check, change management techniques are essential. Mismanagement of change has been found to be a root cause of unresolved disagreements, resulting in a time-consuming and expensive resolution process in many failed projects.
- c. Investigate the path which must be taken in very bad weather. Schedule risk evaluations can help you find places where task lengths are implausible or separate from other tasks that need to be done at the same time (due to a lack of precise rationale). Having a well-

written project schedule is important to make sure the project is done on time and, if necessary, to settle a dispute. In some cases, an early look at a Level 1 schedule could change the procurement process or when important tasks are done to reduce risk and figure out the most efficient ways to do so.

- d. Created a system of alerting people that will let you know if there are problems before they become big problems. Only if action plans are drawn up for major project dangers will risk evaluation and proof of identity be effective. Strategic plan should be determined by the project controls that were already kept track of. You can look for risk prompts, which show when a risk will happen and have an impact on the project, if you have taken steps to deal with a specific risk. Dashboard reporting allows the entire development team to be aware of the harmful status before it happens. This is done by actively monitoring and communicating key risk triggers to each member of the project team. Instead of focusing on how to fix the damage, this allows for assertive mitigation.
- e. Take note of any delays or decreased productivity as quickly as possible so you can get a clear picture of what is going on. When you link your risk action plans to your project controls, you can see and measure delays as well as lost productivity in real time. Changes, not claims, can be used to cut down on delays and disruptions that might happen. This can be done for contractors by giving them notice of an impact and giving them records that show how much it costs or how much it costs the contractor (time sheets, daily reports, and invoices). When evaluating the scope of the contract and any losses the contractor (or at least the owner) claims, the owner must use a fair method. Documentation that is credible at the time of the event will help to show the harm or loss. This will help to keep discussion of the dispute limited to areas of entitlement.
- f. Construction risk management is dependent on input from everyone who works on the project. Proactive management of delays and disruption risks is part of this, and all solutions deal with it in some way, but not all of them. In many cases, the steps outlined above can help speed up claims for delays and interruptions.

2.9 DELAY CONTROL SYSTEM

2.9.1 Retroactive Delay Analysis Methods

In the Community of Building projects Law Delay as well as Disruption Protocol, there are four ways to figure out how long it will take to make up for the delay. These even though they are defined as following:

- a. As Planned vs. As Constructed
- b. The impact was as anticipated.
- c. The structure collapsed as built.
- d. Time-Related Impact Analysis (TRIA).

In the next part, we will present a high-level review of most of these delayed analysis methodologies.

2.9.2 Delay Management Methods and Techniques

Contractor Scheduling uses a variety of tools and approaches to keep construction projects on track and reduce delays as much as feasible.

- a. if there is no schedule, how would the Owner/Contractor understand how long it will take to get things done?
- b. The initial schedule for the project
- c. Updates to the Schedule
- d. Date by which the contract is expected to be completed
- e. The completion date set by the contractor.
- f. A good deal of progress has been made.
- g. Float

2.10 METHOD OF CRITICAL PATH

In the same way that network scheduling has become an important project management tool, it has also become an important evidentiary instrument in the presentation and defense of claims for delays and interruptions in judicial procedures. Courts and administrative bodies have found that the Method of Critical Path (MCP) schedules are the most effective method for determining construction delays.

MCP is an approach in network-based scheduling in which required tasks with set time periods are linked together to use logic linkages that signal workflow. The schedule network can then be used to perform a mathematical calculation to establish the earliest and latest dates on which each activity within the contract schedule can be accomplished. After determining the time durations and logic relationships, a numerical measurement of the schedule network can be performed to determine the earliest and latest dates on which each activity can be accomplished within the contract timetable. The critical path is the collection of connected operations that takes the quickest to traverse the scheduling network. The amount of time that a specific task can be postponed before it has a negative impact on the conclusion of the project is known as float. There is no wiggle room for activities on the crucial path. Before estimating delay damages, determine whether types of work and delays were also on the site's critical chain and, as a result, on the project's crucial path.

2.11 FACTORS/CAUSES OF CONSULTANT RELATED DELAY:

Inadequate communication and coordination between project owners and developers, frequent change of subcontractors and suppliers, category of construction award and bidding, variation during building projects by owners, unfavorable site survey, poorly skilled project management aid, delay in approving and trying to check design specifications, insufficient communication and coordination between project holders and developers, insufficient communication and coordination between construction holders and developers, reoccurring modify of contractors and subcontractors, type of project award and going to bid, variation during building projects by owners, unfavored.

2.12 DELAY FACTORS/CAUSES RELATED TO THE CONTRACTOR

A lot of things can go wrong with a contractor, like dishonesty or money problems, ineffectual site monitoring and scheduling, revisions avoidable mistakes made during work and delays caused by subcontractors, poor contractor experience, and more. There can also be a lot of problems with paying a contractor for completed work, slow decision-making, approval of design documents, and changes by the owner.

2.13 OWNER-RELATED DELAY FACTORS/CAUSES

Corruption, irregular termination of changes while the project is still going on, very little on deposit for designers, changes in specifications and materials, and loss of coordination with the other stakeholders are some of the problems that can happen when a project is being built.

2.14 FACTORS/CAUSES INVOLVING EXTERNAL DELAYS:

Claim that natural catastrophes, on-site accidents, environmental and social variables, rises in material prices and market economic growth, rises in international market prices, and more are all factors that could cause problems. The public enemy, war, and conflict, as well as delays in getting approval from the local authorities, political and military security, government regulations, and access to the site (like electricity, road, and water) are some of the things that could go wrong. There could also be a lack of communication, thieves, an international economic crisis, and a time delay.

2.15 CAUSE OF PROJECT-RELATED DELAY

Punishments for failed delays, contracts with too short a term, etc. Disputes between various parts of the government

2.16 FACTOR/CAUSE RELATED TO RESOURCES

- a. Workplace factors: absenteeism, low morale conflicts, and low productivity strikes, staff shortages, as well as delayed mobilization are all factors to consider. Injuries and a lack of proficiency in equipment handling have come from a lack of labor experience.

- b. Material variation during project work, late material supply, and less qualified materials in construction are all material related factors. Material damage, inflation
- c. Financial delays are caused by financial claims, financial support processes, fund raisers' late money delivery, and international economic problems.
- d. Lack of spare parts, poor infrastructure, faulty equipment, delay in suppliers comply, materials conscription problems, insufficient or limited equipment, low productivity and efficiency of equipment, lack of spares, lack of facilities, equipment failure, wait in suppliers comply

2.17 LITERATURE REVIEW

Construction management has been the subject of numerous studies around the world. Following a literature review on construction projects, construction industry found that different researchers used different words and frameworks to define their knowledge of project success and their study goals.

- a. Puspasari (2005) The study investigated how well the construction projects were recognized for their poor quality. His findings showed that 44 variables were found, and they were broken down into eight major groups, which were as follows:
 - i. project parameters
 - ii. elements relating to the client or supplier
 - iii. Factors affecting contractors
 - iv. Factors relating to labour and materials
 - v. Factors relating to consultants
 - vi. Factors relating to contracts
 - vii. Factors influencing project selection
 - viii. Factors connected to the outside world.

He suggested that another study be undertaken for a specific sort of construction project, such as a residential building, a utility task, a highway maintenance project, a dam construction project, or something else entirely. It is feasible to perform extensive studies into the role and impact of a single political party or resources in the building project just on time overrun.

- b. Majid says because one of the most frequent issues with construction projects is that they take longer than they should (2006). Study: He found that delays can happen for a number of reasons, even those caused by the employer, construction company, acts of God, or even a third party in construction work in Indonesia's city of Aceh. To do this, he has found 57 things that could lead to delays, that he has broken down into eight different groups. According to his findings, the most significant factors from the groups are shown as following:
- i. contractors are the group that causes the most delays, while the rest of the delays.
 - ii. equipment-related delays.
 - iii. delays caused by the client
 - iv. delays caused by materials
 - v. financial planning and analysis delays, which have been the least important group of delays.
 - vi. Delays caused using consultants.
 - vii. Problems created by outside factors.
 - viii. Caused by labour disputes.

As a result, Majid said that contractors should learn how to be more effective managers through work-based training, that a responsible for national agency should help build the construction industry, and that top managers should play a bigger role in solving problems.

- c. Slootman (2007) investigated how project execution planning affects project performance for mining and construction businesses when there are cost overruns and timetable delays. He used these examples to show how project execution planning affects

project performance. Costs for this project came from not being able to properly or adequately address the risks that give rise because of the site's scope and structure. In his findings, he said that following workforce design guidelines is the best way to increase labor productivity and improve predictive ability in six (6) areas, which are:

- i. Human Resources
- ii. Environment.
- iii. Tools and Equipment
- iv. Procedure
- v. Materials
- vi. Design and Engineering

Including the contractor early in the process enables improved communication, which ultimately results in designs that are more constructible than those that were previously developed. It was determined that early contractor involvement and owner participation were critical to the success of this study. It was also determined that the development of FIWPs should be continued and that the amount of detail should be increased by one more step after the contractor's involvement.

- d. It was in 2010 that Gomaa looked into how Sudanese construction companies kept track of construction cost and time, as well as the main factors of project cost overruns. Results show that all construction projects have time overruns of 40% to 60% of the time they were supposed to take, engineers don't know the basics of accrual analysis, and there isn't a way to keep costs down.
- e. Bin Hasan (2010) looked into the problems that JKR (the name of the company) had as the best technical department in Malaysia when it came to time estimation to figure out how long a project would take to finish, because the initial estimate in JKR was based on how long it took to finish other projects. Bin Hasan (2010) found that JKR (the name of the company) had a lot of problems, like these: The findings show what caused the JKR project to be late, which are: poor monitoring (by JKR as well as contractors), an inability to monitor and schedule, poor management (design changes), and financial

irresponsibility (payment to subcontractor). The recommendations were to come up with a way to improve prediction in JKR projects and to come up with a way to figure out how long a project will take.

- f. Hemanta Doloi, Anil Sawhney, Iyer, and K. C. Rentala, Sameer (2012) developed a study on the causes of building delays in India, and they classified the causes as follows:
 - i. Site-related issues
 - ii. project-related issues
 - iii. process-related issues
 - iv. human-related issues
 - v. technical issue-related issues
- g. A study by Mohamed M. Marzouk and Tarek I. El-Rashes in Egypt found that the main reasons for the delay were the following: not having enough people, not having enough money, and not having enough time.
 - i. project holder
 - ii. advisors
 - iii. developer
 - iv. Material
 - v. workers & machines
 - vi. Project
 - vii. External related delay factors.
- h. El-Razek et al. (2014) looked into the causes of construction delays in Egypt and found that most of the construction partners don't agree on the RII of different delays, blaming each other for IMP. I'm going to wait. He knows that a project needs to be done with help from other people.

- i. In their reviews, Assaf, Sadi A. Al-Hejji, and Sadiq (2006) found 50-six main reasons why big building projects took longer than they should have. He split the delays into nine (9) main groups, each with a different level and party. Between 10% and 30% of project developers say that their projects take longer than they thought they would, says the author. Almost 25% of construction consultants (advisors) say that the average time delay for a project is between 30% and 50%. Owners say that labor and contractors are to blame for project delays, according to a survey that he did for his project. A lot of delays happen because consultants and clients know that awarding contracts to the lowest (list) bidders is the most common cause of them. Construction contractors who think they're owners are also a big cause of delays.
- j. Al-Ghafly said that public sewerage and drainage projects have been taking longer than planned (1995). He finds and categorizes sixty plausible causes why the meeting was late. This is what Al-Ghafly came up with: Most of the time delays happen in medium and large project focuses (project sizes), with the most severe delays in small projects. According to his studies and overview, the main causes of project delays are the project owner, the contractor, the original plan, the duration forecast, and construction preparation. It's the main reason.
 - i. financial constraints
 - ii. delays in the owner's consent and decision-making
 - iii. alterations in the plan and size (project scope)
 - iv. difficulties obtaining a work permit
 - v. organizational and communication issues.
- k. Al-Momani (2000) investigated why 130 Jordanian government projects took longer than they should have. As according to his studies, the much more common reasons for being late were as follow:
 - i. design
 - ii. user modifications

- iii. weather
- iv. site conditions
- v. late supply
- vi. financial conditions.
- vii. Increase the amount of work.

This study said that paying additional attention to the things that sometimes when delays will help production advisors avoid contract disputes.

- a. As according Megha Desai and Rajiv Bhatt (2250), there really are 59 things that can slow down home construction projects. These factors are broken down into nine groups, each of which has a time delay.
 - i. project holder (user)
 - ii. construction developer
 - iii. consultant, (4) design
 - iv. construction material
 - v. equipment
 - vi. employees
 - vii. external elements based on their nature and mode of existence.
 - viii. linked to the project
- b. Aziz, Remon Fayek, and their colleagues looked at 99 variables that could cause construction projects to be late, and they grouped the causes into the following ten main groups:
 - i. Consultant
 - ii. Contractor
 - iii. Design

- iv. Equipment
 - v. External
 - vi. Labour
 - vii. Material
 - viii. Owner
 - ix. Project-related delay causes
- c. Aziz, Fayek, and Fayek (2013), for comparison purposes, look at and identify high-impact delays in Egypt. Problems with money, bribery strategy trends, and so on Project planning and managing that doesn't work In both the research and how the site was run, they were not very good. There is no money control on site. Rework, hiring a non-skilled contractor Unexpected events, bad planning, and a poor work force all led to the company having problems. Contractors who don't have enough experience Breakdowns of equipment happen all the time. This is what happened all over the world: The difficulty of the work (project type, project scale, etc.) Legal disputes between project partners, a bad construction process, low-skilled workers, and other things can make it hard to finish a project. Conflicts.
- d. Tsegay Gebremiwet and Hanbin Luo (2017) looked at how the three stages of construction and the overall result were compared. They found that the overall result is the most similar to all stages of delay causes. They also come to conclusion that top three most important reasons for the Ethiopian construction project to be late have been found. People who did this research in Ethiopia say that corruption is the main reason for construction delays there. Some other things that are making it more difficult for people to afford things are inflation, low-quality materials, late design documents, slower material supply, late contract agreement and receipt of completed project work, bad site management, and poor project planning and schedule. Results from this study show that Ethiopian building projects often take longer than planned because of cost overruns and time overruns. They also broke down the main causes of delay into the following groups: Outer causes, resource-related causes, and contract-related causes are the three types of causes. Absence, 4) Causes That Are Related to Responsibility

- e. In a study called "An assessment of the causes of delays on building construction projects in Uganda," L. Muhwezi, J. Acai, and G. Otim (2014) looked into what causes delays in Uganda and found that there was a total of eighty-one (81) reasons for them. They split them into four groups: advisor-related delay causes, contracting firm delay causes, customer delay causes, and external-related delay causes.
- f. Tushar Khattri¹, Sohit Agarwal², Vais(hant Gupta³, and Mukesh Pandey⁴ (2016) look at the most important variables and groups when it did come to why things take longer than they should be.
- g. They listed the top ten most critical causes of delay using the Important Index (IMPI) technique as follows:
 - i. Delays in material delivery
 - ii. Price Variation
 - iii. Project Site Robberies
 - iv. Poor Material Quality
 - v. Delays in material requests
 - vi. Untrustworthy subcontractor
 - vii. Employees with low productivity.
 - viii. A severe weather events.
 - ix. Changes in specification and material during the working day.
 - x. Utilities are late in supplying services.
- h. There are many reasons why construction projects in India aren't finished on time. Dinesh Kumar R (2016) does a literature survey and a questionnaire to find out. Most of the factors that cause delays in construction projects, according to this report, are not enough work and experience by the contractors and poor risk management and cluelessness. The best way to avoid this kind of delay is to hire a contractor who has a lot of experience with the type of project you're working on. Specialized and

international contractors know how to deal with elevated situations by using successful risk management methods.



3. IDENTIFICATION OF THE RESEARCH PROBLEM

3.1 INTRODUCTION

Delays have a negative impact on all aspects of a project, including time, quality, cost, and safety. With long-term delays, the plan loses its economic justification, which could lead to project termination in the private sector or a deterioration in quality and safety in the public sector to avoid further financial losses. Legal concerns between the employer, contractor, and consultant, as well as lower productivity and revenue, are all negative consequences of project delays.

3.2 THE CONSEQUENCES OF PROJECT DELAYS

These repercussions need to be investigated as soon as possible so that a solution may be found for resolving them before they end up having a detrimental effect on the overall project. In most cases, there are obvious causes that cause them and, as a result, lead to the delay; the researcher is going to explore each of these causes in detail here. The consequences of the delay are shown in figure 3.1.

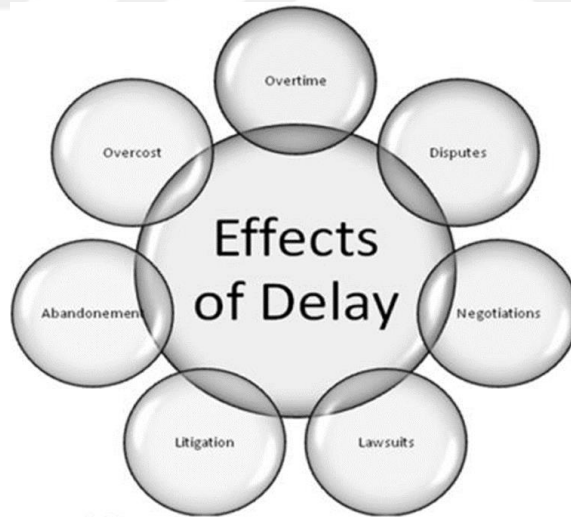


Figure 3.1: Delay's Impact.

Several important consequences of the delay were discovered during the study:

- a. Costs for the project have risen.
- b. Increase the market's risk. Overall efficiency falls.
- c. Increased working hours - (decreasing the safety of individuals).
- d. Production pause.
- e. Customers' faith and trust are eroding. Local or regional development is stalled.
- f. Land purchase costs have risen.
- g. Material costs have risen.
- h. Overall team stress has increased.

3.3 THE MOST EIGHT CAUSES OF CONSTRUCTION PROJECT DELAYS

Unlike other endeavors, construction projects have many unique characteristics, such as a long timeline, hazardous working conditions, numerous steps and high financial stakes. This level of technological and organizational complexity increases the likelihood of project delays and overruns. A delay in construction is defined as the additional time needed or incurred either beyond the stated completion date or beyond the agreed upon completion date by project stakeholders. All parties in the project were efficient in completing the project on time, even though the construction process is subject to a wide range of variables and unforeseen circumstances.

The following are the most typical reasons for delays in construction. These delays can be reduced to a minimum if you have competent management, technical knowledge, and strategy in place.

3.3.1 Changes to The Project Scope

The scope of work in such a construction project applies to the deliverables which are expected at the completion of the project. A lack of scope definition at the outset of any construction project can result in cost overruns and time delays. As a result, all project plans, timetables, cost and quantity estimating, procurement, and quality processes are based on

the initial project scope. Changes in project scope can arise as a result of a number of circumstances, including insufficient initial project scope definition, underestimation of inherent uncertainties and risks, project funding issues, a change in the client's interest, or force majeure.

This could lead to a change in order, which could lead to changes in project deliverables, budget, and/or the entire project crew. As a result, any modification/change within the project scope during execution will result in the entire initial project setup being revised, i.e. revised budget, construction methodologies, construction process, procurement plan, quality control plans, and many more, resulting in even more time, infrastructure, and cost to complete the works in comparison to the initial baseline. To gain effective control over changes in the project scope, it is critical to first recognize that change is inescapable in the project and can also be beneficial to the project's overall performance. Thus, the most important goal is to incorporate proper change in scope management and set up such a proactive strategy that can be applied engaging project stakeholders as well as addressing their demands throughout the project lifecycle, as shown in Figure 3.2.

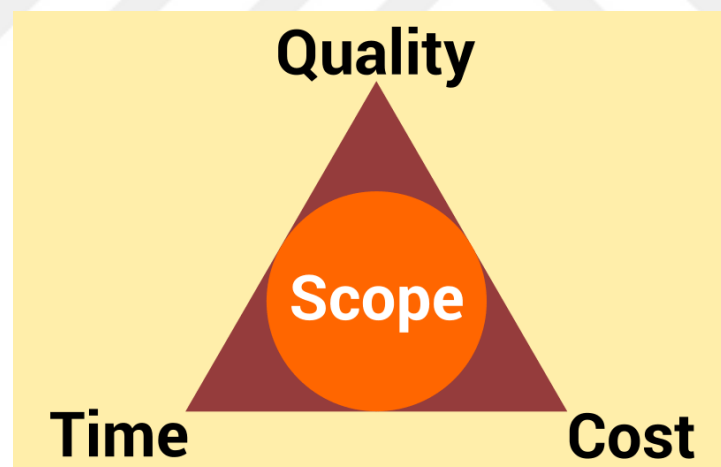


Figure 3.2: The Scope Triangle.

The Key performance indicators, such as milestones, that measure whether or not the project's goals have been met are crucial early in the project's planning phase. If you want to avoid disagreements, you must continually ask the sponsor's permission for any modifications, and you must do it in a timely manner. The scope of the project can be frozen to focus on the anticipated future deliverables while the project is undergoing rapid evolution during construction.

3.3.2 Project Difficulty

Time and money overruns can be caused in large part by the project's complexity. When it comes to huge building projects like dams and skyscrapers, the implementation duration is significantly longer than for smaller projects like residential homes, stores, and non-commercial constructions.

This could lead to changes in material costs, currency exchange rates, and inflation rates, necessitating an increase in the project's initial proposed/allocated budget. Consequently, the construction project may take longer to complete because of rising prices and extensive negotiation procedures. A high level of complexity necessitates extensive planning, scheduling, and estimations.

A failure to take enough precautions to omit these problematic parts of the project will lead to change orders and consequent delays and cost overruns. It's possible that this will cause delays and raise expenses. In addition, a project's quality can be assessed by looking at the number of parties involved, each with a different set of priorities, and the length of the communication chain, which results in a lack of timely feedback. Disagreements and conflicts may arise as a result of a lack of differentiation between the parties' goals, which could cause the project to be delayed or go over budget.

Every aspect of the project, including the WBS, significant milestones, project stakeholders, the methodology to be utilized, and the delivery time to the client, must be thoroughly planned to avoid or minimize the impact of time delays and cost overruns, Figure 3.3 [25]. As a result, the client's requirements must be taken into account while defining the project's objectives and scope. To make sure the project stays on schedule and just the intended work is done. If you want to do this, you must have a team that is open and honest.



Figure 3.3: Project Complexity [25].

3.3.3 Preparation that is Insufficient

When it comes to many aspects of life, planning is an important role. The term "planning" is used in a variety of contexts, but it can still be defined as organizing the mechanical and human inputs so that the maximum utilization is attained. You must first identify and separate the tasks and activities that must be carried out in order to accomplish the desired result in the least amount of time and money possible while planning a project. The moment a concept for a new project is conceived, this process begins. In order to get the greatest outcomes [26], a planner must account for all of the professionals and artisans who will be involved in the construction process from start to finish, Figure 3.4.



Figure 3.4: Inadequate Planning [26].

When a project is in the planning stages, it's important to account for everything from the plants and equipment types to the materials and suppliers to the personnel, time, and money needed to complete the curtain phase. During the building process, certain activities/tasks like concrete curing, the time needed to pour the second layer of concrete, the time required to settle the prime coat, and so on, take time to settle. Planning and other parties with a stake in the outcome should be aware of these "settling in" moments. Non-compliance with planned project deliverables, as well as a lack of sufficient deliverables, results in higher costs and lower quality. The construction manager must precisely organize their responsibilities to ensure a seamless flow of the work, the value of the money, and a timely completion.

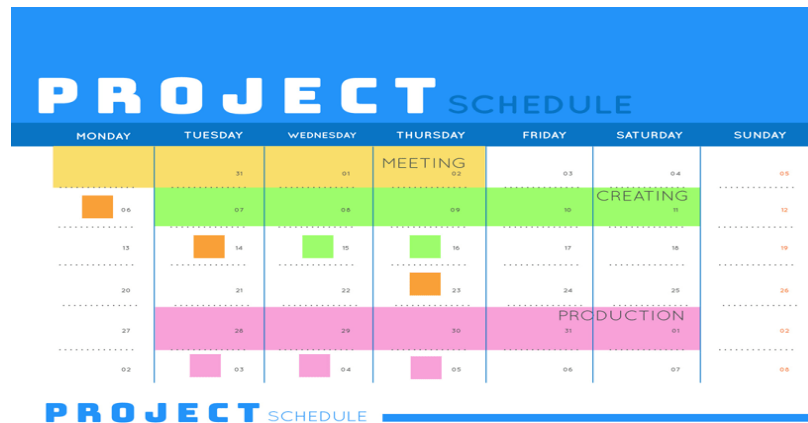
3.3.4 Inappropriate Project Schedule

Except that the project is completed on time, it is important to plan out all of the work that needs to be done. People working in the area can maintain tabs on the status of their progress by using a scheduling tool. The schedule also shows what needs to be done in the future and gives information about the past that could help with analysing the past. There are many commercially available project management tools that can be used to create a bar chart, but the most popular method is to use an application like Oracle Primavera P6, Microsoft Project, or one of the many alternative tools available on the market today such as Asana or Ceiton or EnQuire.

Scheduling is an important part of leading and working on a project well and making the most of the people and resources that are available. Scheduling requires a lot of technical knowledge, the order of construction tasks, and a clear understanding of how each task relates to the others and the resources it needs. If the project schedule isn't right, valuable project resources will be put toward tasks that aren't as important. As a result, the most important tasks will be slowed down, and construction will take longer than expected. For fewer scheduling issues, the scheduler should be well-versed on the project's technology. The scheduler should also be able to precisely comprehend the scope of the project and operate around this in an efficient manner. He should have a thorough understanding of the project and be able to predict how each event would unfold. The scheduler can create a comprehensive Work Break Down Structure (WBS) that includes all of the project's activities, resources, costs, constraints, and risks because they are well-versed in contracts,

engineering estimates, bill of quantities, engineering drawings, project scope, nature of the works, client requirements, and other relevant documents. Modern project management tools, such as Oracle Primavera P6, Microsoft Project, Asana, Ceiton, and EnQuire, should have been used by a scheduler. Oracle Primavera P6 is a vital tool for managing projects in most industries, therefore it's a good idea to learn how to work with it. Oracle Primavera P6 is software for planning, scheduling, and keeping track of projects. It is built on Oracle or Microsoft SQL databases and can be used to manage projects across an entire organization. Primavera is not easy to use, so it can only be used by trained, experienced experts. My recommendation is ScheduleReader if you wish to communicate information from Primavera P6 with everyone engaged in your project or team and make it feasible for them to view, print, or analyze Primavera files. To view, print, and analyze straight Primavera P6 files without having to wait for an expert to prepare a PDF report, utilize ScheduleReader, an easy-to-use project viewer. This software can also be downloaded for free for a trial period of 15 days.

It also lets you look inside the.xer file, which makes it easier for everyone involved in the project to use and saves users a lot of time. As compared to Primavera, ScheduleReader's UI is clearer and easier to use because it follows Primavera's default screen layout. If you want to see how a project is progressing, look no further than the Gantt charts in Microsoft Project. A.xlsxs files can be directly imported into Primavera P6 using ScheduleReader, which allows you to adjust the progress of activities. When you put the work schedule in place, it will be executed without your intervention. Using ScheduleReader, you can also see how your progress compares to the baseline by importing the.xer file directly. Figure 3.5 demonstrates how [28], similar to Primavera P6, you may add four (4) baseline files and analyze them to see if the work plan has changed.



3.3.5 Modify in Design

Changes or mistakes in the design are a big reason why construction projects take longer and cost more than expected. These documents are often used to acquire a clearer picture of an employer's requirements and to devise methods of getting improved technical assistance into execution phase. If somehow the design is incorrect, the project's deliverables will either be insufficient or incorrect. This will cause the wrong techniques to be used to get good results. For example, if these design mistakes only become clear during the actual execution of the project, any attempts to fix them will cause a time delay and a cost overrun. Second, all cost, time, and quality estimates for the project are based on these designs. If the designs change at a later stage, this will lead to cost and time variation orders [29], Figure 3.6.

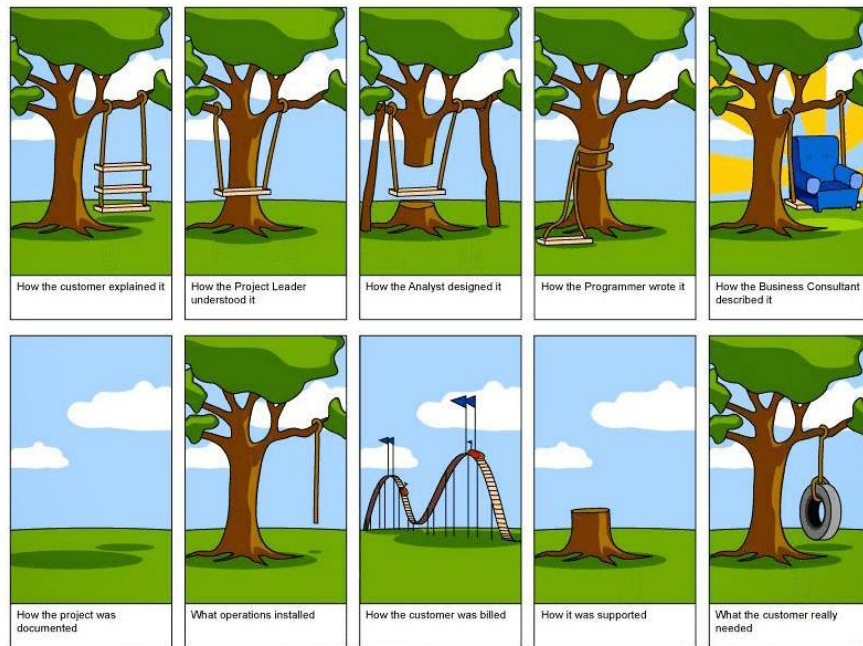


Figure 3.6: Design Variation [29].

In order to produce an appropriate design, it is essential that the engineering teams and all other stakeholders communicate clearly and in writing, and that a well-planned design procedure be used, which allows for revisions, corrections, in-depth study, evaluations, and final approvals. Effective project planning, control and monitoring should be implemented to improve performance of the project throughout its life cycle.

3.3.6 Engineering Estimate Error

An Engineer's estimate is used by the Employer to establish the first investment needed for any project. As a result of this, the Engineer Estimation requires actual cost estimates in order to calculate all of the economic benefits and calculations.

You'll need a thorough investigation, important architectural skills, a well-defined scope of the project, accurate quantity calculations, and a well-thought-out method of operation in order to get an engineer's estimate.

As a result, the project's timetable will be pushed back because of a cost overrun. All project stakeholders were approached extensively by the maximum take engineer in order to gather all of the necessary information for an accurate cost estimate. An accurate engineering

estimate is more likely when design parts and the client are communicating well [30], as shown in Figure 3.7.



Figure 3.7: Engineering Estimate Error [30].

3.3.7 Material and Equipment Management That is Inefficient

The implementation of the project and its connection to material management are both critical. Material costs 60 to 70 percent of a construction project's direct costs, and they are always a significant part of the budget. Lowering the entire cost of procurement, purchase, or lease has a substantial impact on the project's overall cost. On-site quality and quantity of materials and equipment will be maintained in accordance with a well-established system of procurement and delivery. This can lead to unnecessary building costs, as well as a delay in the completion of essential projects due to the absence of necessary materials or equipment at the moment.

It is imperative that construction managers actively pursue a most efficient use of existing and equipment. Related to material handling, which encompasses procurement, inventories, shop construction, and field service, must be given special attention for time and cost savings in order to maximize efficiency. Construction technology could be revolutionized by utilizing modern technologies in unique ways, Figure 3.8. It is possible to reduce waste and improve profitability by implementing a well-coordinated planning process, evaluating

quantities and requirements as well as the cost and time required to procure, purchase [31], transport, store, operate, maintain the equipment, and to minimize wastage by dropping the costs and saving them valuable time.



Figure 3.8: Inefficient Material [31].

3.3.8 Inadequate Post-Execution Stage Management

There are numerous factors that might cause cost overruns including delays in construction projects after they have been completed. Even huge corporations occasionally overlook or undervalue the conclusion of a project because that's the last step in the process. Sluggish closure can cause unexpected delays and additional costs for all project stakeholders because unresolved disputes/claims connected with the customer's final approval can delay the final delivery of several milestones. This includes issues with variation orders, accepting final payment certifications, issuing retention moneys, and issuing performance security/bonds. Make sure the job is finished completely and that all documentation is easily available to avoid delays caused by poor closure. Figure 3.9 shows that all stakeholders have provided the essential information and documentation to ensure that there will be no misunderstandings or disputes in the future [32].



Figure 3.9: Poor Management After The Execution Phase [32].

3.4 ASPECTS THAT FREQUENTLY CAUSE DELAYS

Let's look at some of the most common factors that contribute to construction delays [33]. as shown in illustration 3.10.



Figure 3.10 : Causes Delay [33].

3.4.1 Delays Caused by Clients

- a. Changes to the original design are possible.
- b. Unexpected financial difficulties.
- c. Decisions are taken slowly.
- d. Their ultimate aims and desires are unknown.

3.4.2 Delays in Contractors

- a. Other jobs are overbooked.
- b. Management abilities are lacking.
- c. Ineffective communication.
- d. There is a shortage of subcontractors.

3.4.3 Delays in External Consultants

- a. Architect, engineer, or other expert advisor.
- b. Project information is delivered on time.
- c. Design constructability.
- d. Communication is difficult.
- e. Construction time is given top priority.
- f. Other projects take precedence.

3.4.4 External influences

- a. Weather.
- b. Regulative restrictions.
- c. Delays in public works (water, gas, sewer hook-ups, etc).

- d. Influence of banks

3.4.4 PROJECT SPECIFICATIONS

- a. End-use function (office, residential, etc...), as well as any extra constraints.
- b. Complexity.
- c. Location. Access.
- d. Power is available.

3.5 THE BENEFITS AND DRAWBACKS OF QUESTIONNAIRES

3.5.1 The Benefits of Questionnaires

- a. Practical.
- b. Big amounts of information can be gathered from a large number of people in a short period of time and at a low cost.
- c. Can be performed by the researcher or by any number of persons with little impact on its validity and reliability.
- d. The results of the questionnaires are usually immediately and easily quantifiable by either a researcher or a software application.
- e. Can be more 'scientifically' and objectively assessed than other types of study.
- f. When data is quantified, it can be used to compare and contrast other studies, as well as to assess change.
- g. Quantitative data, according to positivists, can be utilised to develop new theories and/or test existing ideas.

3.5.2 THE DRAWBACKS OF INQUIRY FORM

- a. Is thought to be insufficient for processing particular forms of information, such as shifts in feelings, behaviors, and emotions.

- b. Phenomenologists believe that quantitative research is nothing more than an artificial creation of the researcher because it only requests a limited amount of information and does not provide an explanation for the data.
- c. It cannot be accepted.
- d. There is no way to determine whether or not a response is being honest.
- e. There is no way to tell how much thought a person has put into their response because there is no way to gauge it.
- f. The respondent might have forgotten, or they might not be taking into account the full picture.
- g. Different people will have different interpretations of each question, and their answers will be based on how they interpret the question themselves. For instance, something that is considered "good" by one person may be considered "bad" by another, which suggests that there is a level of subjectivity that is not being acknowledged.
- h. There is some researcher imposition, which means that when the researcher is constructing the questionnaire, they are making their own judgements and assumptions about what is significant and what is not significant...as a result, they may miss something important. This means that there is some researcher imposition.

3.6 THE LAYOUT OF THE QUESTIONNAIRES

The questionnaire has been separated into six pieces [35], each of which is depicted in Figure 3.11. The eight hypotheses that were discussed before will be included in the questionnaire in a variety of different sections, as follows:

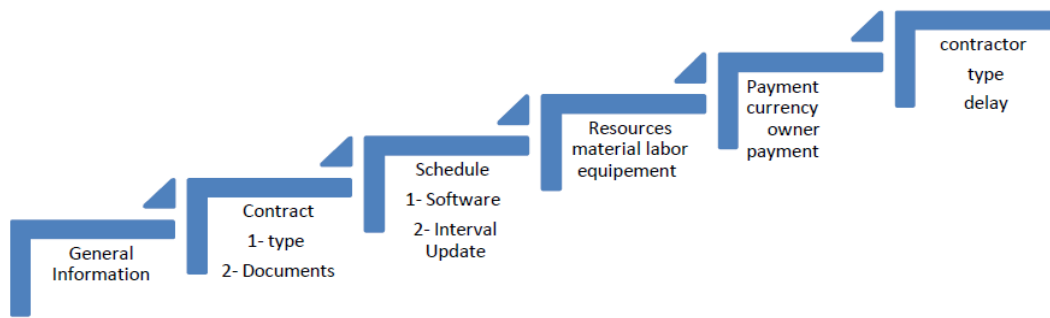


Figure 3.11: Layout Sections of Questions in The Questionnaire [35].

- a. This ensures that the various project parts are appropriately coordinated [36].
- b. This is the project scope and document management to ensure that all required work (and only required work) is included in the contract from the start [37].
- c. which is the project time management and effective project schedule, realistic based on resource availability, and regular acceptable update [38].
- d. which is project cost management in order to identify required resources while preserving budget control, timely payments, and currency availability [39].
- e. This is project quality management to ensure functional requirements are met, and the most commonly used materials [40].
- f. concerning human resource management in order to develop and successfully employ project employees [41].
- g. which is the management of project communications to enable effective internal and external communications [42].
- h. Project risk management analyses and mitigates potential hazards, and how decisions are based on scientific evidence [43].

The results of the questionnaire are analysed to determine whether the study met its stated goals. In the questionnaire, the research's goals are laid forth as follows:

- a. The initial purpose of the questionnaire is to generate new possibilities right from the beginning in order to free the respondents from their commitments regarding the delay. The second purpose of the questionnaire, which is to identify the primary factors that

contribute to the delays that occur in building construction projects in Sudan, can be seen throughout. The third purpose of this section, which was to identify the perceptions of the three major stakeholders regarding the causes of delays and to provide realistic ways to eliminate or minimize them, was addressed in the sixth section through the inclusion of an opinion paragraph in the sixth section. In the final part of the questionnaire, which is the third portion, the tools for better time management and organization, which is the fourth goal, are displayed [44].

- b. The methods that the researcher used to create the questionnaire started with an in-depth analysis of the key causes of delay in general as well as previous studies. After that, the researcher grouped the primary causes of delay together to discover all of the associated elements for each. For instance, the researcher used the contract as a starting point and made an effort to isolate the clauses and provisions inside it that might be responsible for the delay. The kind of contract, its documentation, the number of liquidated damages, and other considerations all come into play [45].
- c. The researcher believes that the value of the questions should be used to decide the sequence in which they are asked. Questions at the beginning of the questionnaire were designed to ensure that the correct person was being interviewed, as well as to screen out those who a passing interest in the subject with a separate set of questions had only; screening questions, designed separately under the heading "Recruitment questionnaire," were used solely to find suitable respondents before properly administering the questionnaire [46]. Questions at the beginning of the questionnaire were designed to ensure that the correct person was being interviewed, as well as to screen out those who a passing interest in the subject with a separate set had only [47][48]. The flow of the questions from one to the next is natural, and this is helped by grouping the questions into subjects that follow a logical order. This helps to collect the views of respondents in a manner that is logical and orderly [49][50]. The questions contained in the main body of the questionnaire are organized in a logical manner and, as a result, facilitate the cognitive processes of the responders. This typically requires moving from broad to narrow inquiries, from open-ended to closed-ended queries, and from unprompted to prompted inquiries in the course of the conversation [51]. The questions are organized into six distinct categories, each of which addresses all facets of the construction industry

[52][53]. The purpose of the logical sequencing of the questions within one section and across the questionnaire is to make it easy for individuals to answer, and it is hoped that this would encourage them to participate [54].



4. RESULT AND DISCUSSION

4.1 INTRODUCTION

This chapter will analysis the questioner and find the true results depends on the answers that sent to the specialist by online forms.

4.2 THE ANALYSIS

There are Nine parts that the analysis discusses, all these parts represent the questions that given to the specialist, and they give their answers by taking all the chooses to answer the questioner.

The researcher directed a set of general questions to the sample members, whose total number reached 60 individuals in the first part of the questionnaire, and the answers were as shown in the following tables and figures.

a. Part One:

i. What type of employer do you work for?

Table 4.1: Employer.

Options	No. of responses	Percent
Public sector	31	52%
Private sector	23	38%
Common sector	5	8%
Project owner	1	2%
Sum	60	100%

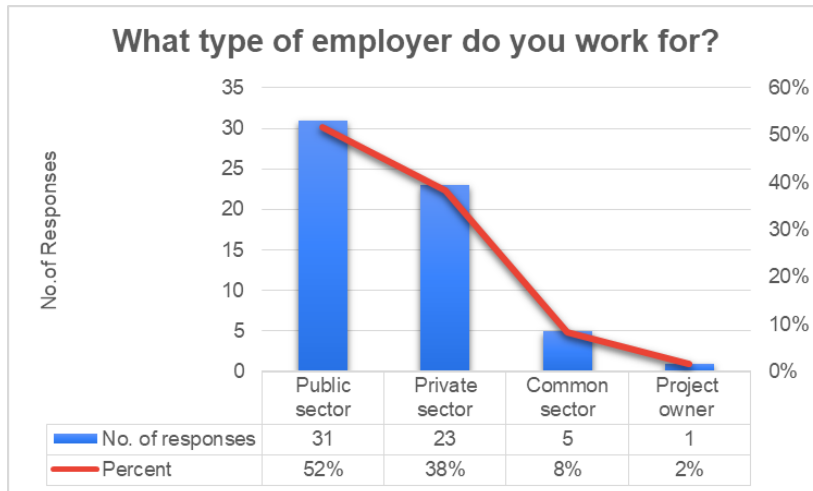


Figure 4.1: Employer.

ii. The nature of the work of the organization you work for?

Table 4.2: Nature of The Work.

Options	No. of responses	Percent
Engineer	45	75%
Contractor	5	8%
Consultant	8	13%
Project owner	2	3%
Sum	60	100%

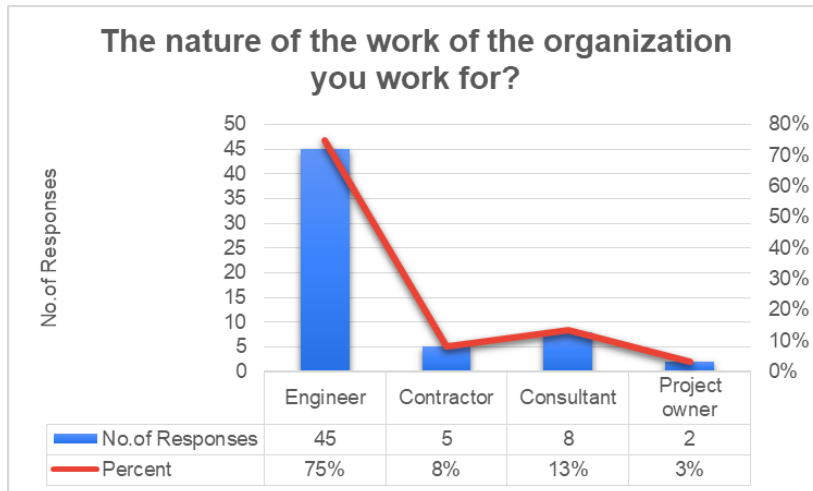


Figure 4.2: Nature of The Work.

iii. How many years of experience in construction projects?

Table 4.3: Years of Experience.

Options	No. of responses	Percent
Less than five years	22	37%
Five to ten years	16	27%
Eleven to fifteen years old	7	12%
Sixteen to twenty years	11	18%
More than twenty years	4	7%
Sum	60	100%

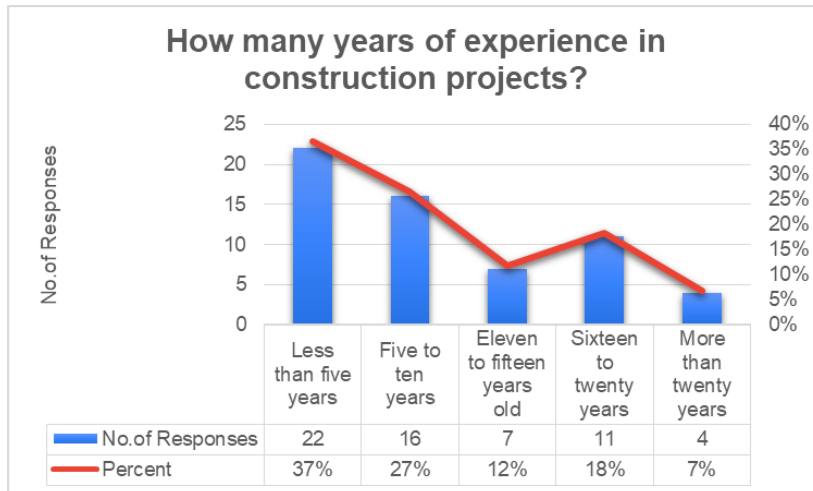


Figure 4.3: Years of Experience.

iv. Qualification

Table 4.4: Qualification.

Options	No. of responses	Percent
B.Sc.	36	60%
High Diploma	4	7%
M.Sc.	14	23%
Ph.D	6	10%
Sum	60	100%

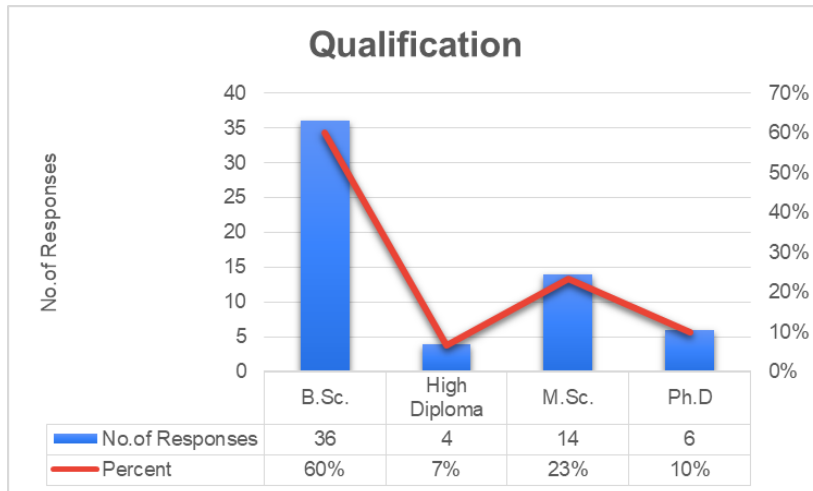


Figure 4.4: Qualification.

b. Second Part

The researcher asked a question to the sample members about the effect of the factors that is related to the owner of the project that led to the delay. The answers of the sample members to the factors below were as follows :

i. Delay in making decisions

Table 4.5: Making Decisions.

Options	No. of responses	Percent
Great effect	46	77%
Limited effect	12	20%
No effect	2	3%
Sum	60	100%

According to the answers of the sample affected whose their number (60) and their percentages shown in the table above , (77%) of those affected by the survey believe that delay in making decisions it has a great effect that lead to delay, (20%) of those affected by the survey believe the factor that was inquired about it has a limited effect and (3%) of those affected by the survey believe the factor that was inquired about it has no effect .

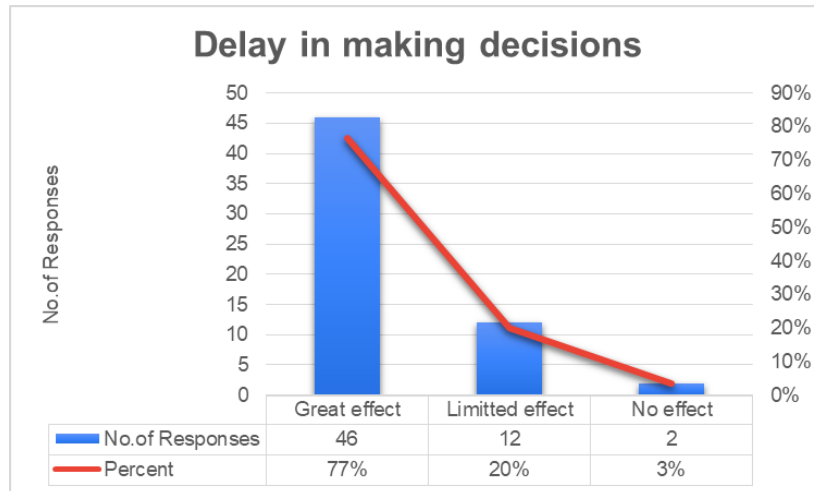


Figure 4.5: Making Decisions.

ii. The owner is involved in the construction phase

Table 4.6: The Owner is Involved in The Construction Phase.

Options	No. of responses	Percent
Great effect	37	62%
Limited effect	21	35%
No effect	2	3%
Sum	60	100%

According to the answers of the sample affected whose their number (60) and their percentages shown in the table above, (62%) of those affected by the survey believe that the owner is involved in the construction phase it has a great effect that lead to delay, (35%) of those affected by the survey believe the factor that was inquired about it has a limited effect and (3%) of those affected by the survey believe the factor that was inquired about it has no effect.

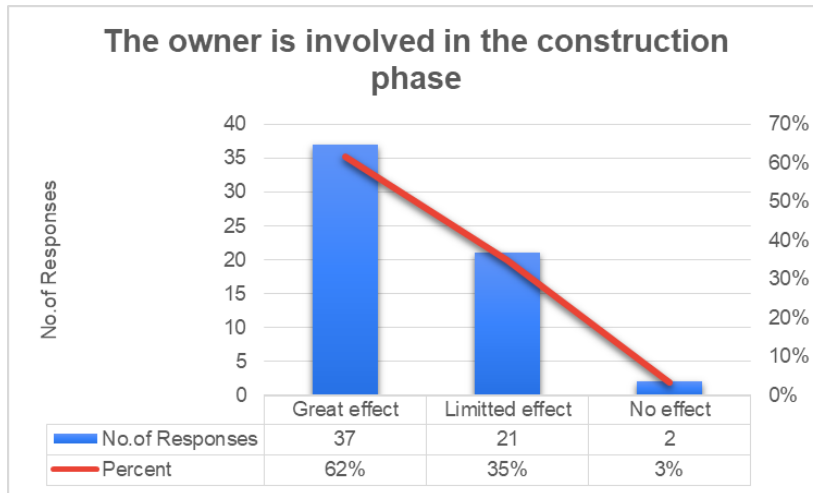


Figure 4.6: The Owner is Involved in The Construction Phase.

iii. Lack of financial funding

Table 4.7: Lack of Financial Funding.

Options	No. of responses	Percent
Great effect	55	92%
Limited effect	2	3%
No effect	3	5%
Sum	60	100%

According to the answers of the sample affected whose their number (60) and their percentages shown in the table above , (92%) of those affected by the survey believe that Lack of financial funding it has a great effect that lead to delay, (3%) of those affected by the survey believe the factor that was inquired about it has a limited effect and (5%) of those affected by the survey believe the factor that was inquired about it has no effect .

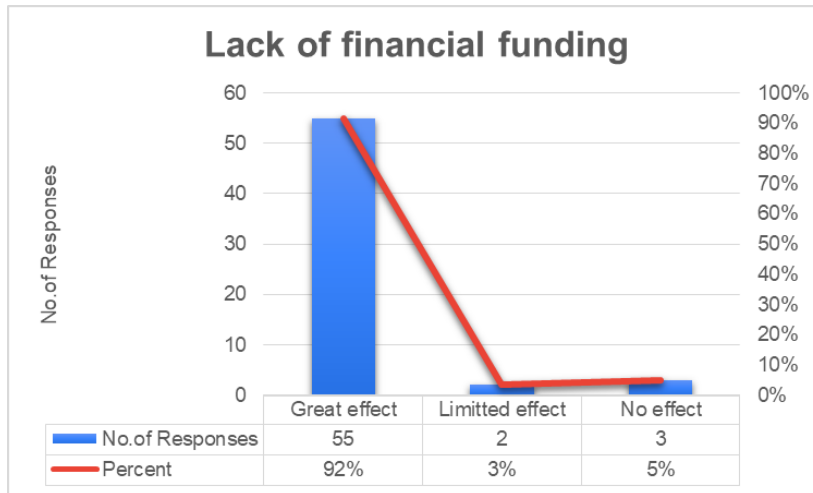


Figure 4.7: Lack of Financial Funding.

iv. Delaying payments due

Table 4.8: Delaying Payments.

Options	No. of responses	Percent
Great effect	45	75%
Limited effect	13	22%
No effect	2	3%
Sum	60	100%

According to the answers of the sample affected whose their number (60) and their percentages shown in the table above , (75%) of those affected by the survey believe that delaying payments due it has a great effect that lead to delay, (22%) of those affected by the survey believe the factor that was inquired about it has a limited effect and (3%) of those affected by the survey believe the factor that was inquired about it has no effect .

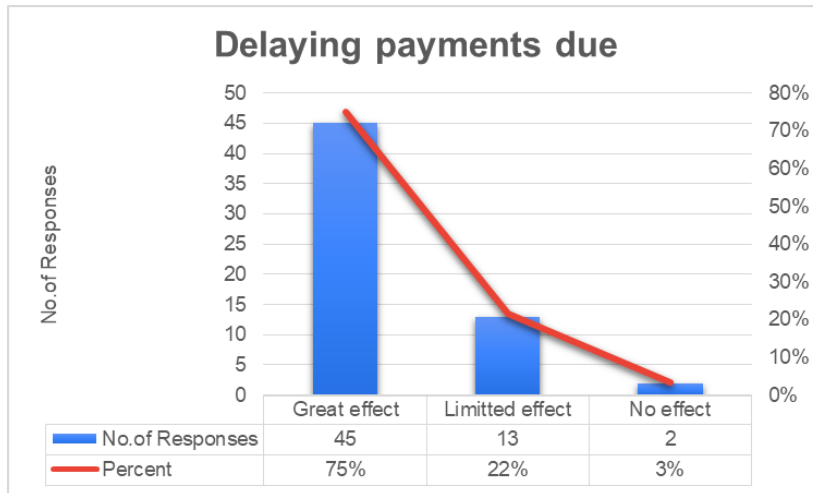


Figure 4.8: Delaying Payments.

v. Delayed contractor delivery to the site

Table 4.9: Delayed Contractor Delivery to The Site.

Options	No. of responses	Percent
Great effect	40	67%
Limited effect	18	30%
No effect	2	3%
Sum	60	100%

According to the answers of the sample affected whose their number (60) and their percentages shown in the table above , (67%) of those affected by the survey believe that delayed contractor delivery to the site it has a great effect that lead to delay, (30%) of those affected by the survey believe the factor that was inquired about it has a limited effect and (3%) of those affected by the survey believe the factor that was inquired about it has no effect .

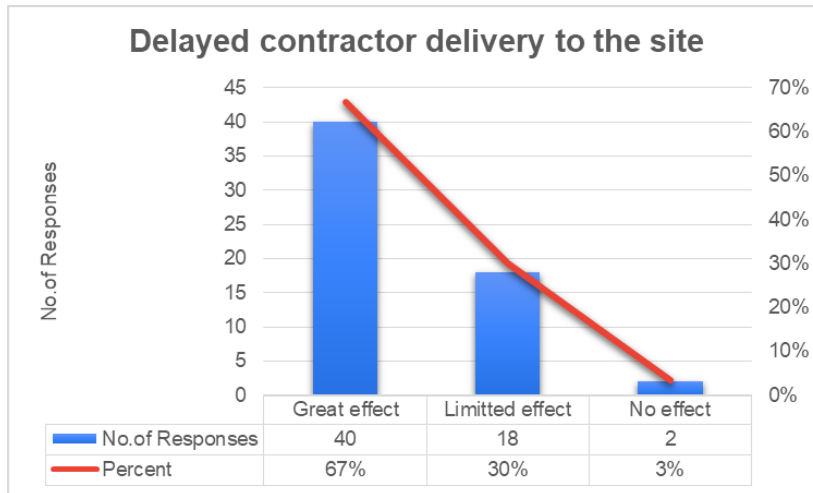


Figure 4.9: Delayed Contractor Delivery to The Site.

vi. Variables that occur in the design of the project during the implementation of the project

Table 4.10: Variables Occur in The Design of The Project During The Implementation.

Options	No. of responses	Percent
Great effect	33	55%
Limited effect	26	43%
No effect	1	2%
Sum	60	100%

According to the answers of the sample affected whose their number (60) and their percentages shown in the table above , (55%) of those affected by the survey believe that variables that occur in the design of the project during the implementation of the project has a great effect that lead to delay, (43%) of those affected by the survey believe the factor that was inquired about it has a limited effect and (2%) of those affected by the survey believe the factor that was inquired about it has no effect .

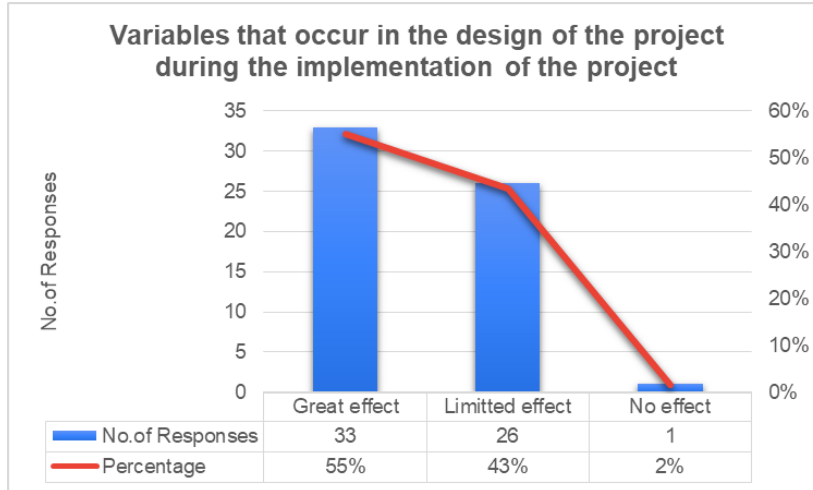


Figure 4.10: Variables Occur in The Design of The Project During The Implementation.

c. Third Part

The researcher asked a question to the sample members about the effect of the reasons related to the consulting services on the delay in the project. The answers of the sample members to the factors below were as follows :

i. Design errors

Table 4.11: Design Errors.

Options	No. of responses	Percent
Great effect	49	82%
Limited effect	8	13%
No effect	3	5%
Sum	60	100%

Through the answers of the sample members shown in the table above to the question posed to them by the researcher, it becomes clear to us that the sample members in a percentage (82%) believe that the design errors which is one of the reasons related to the consulting services they have great effect that lead to delay in project completion , the other sample members in a percentage (13%) believe the factor that was inquired about it has a limited

effect and the sample members in a percentage (5%) believe the factor that was inquired about it that has no effect .

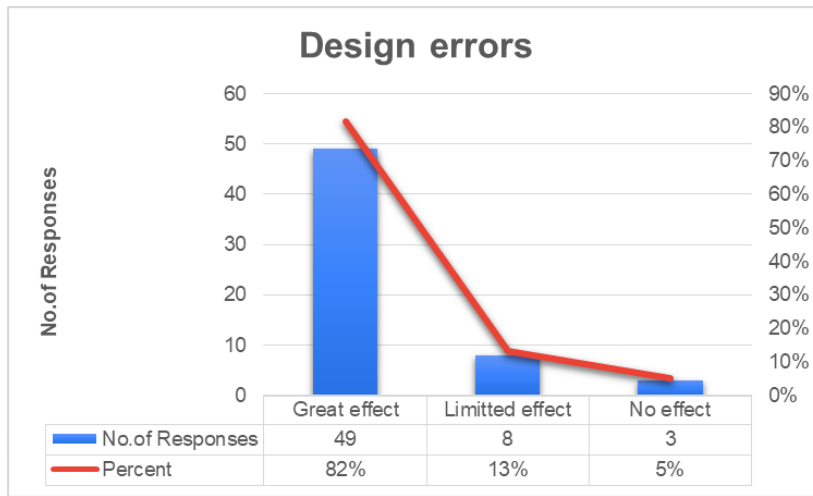


Figure 4.11: Design Errors.

ii. Weakness in project management

Table 4.12: Weakness in Project Management.

Options	No. of responses	Percent
Great effect	54	90%
Limited effect	4	7%
No effect	2	3%
Sum	60	100%

Through the answers of the sample members shown in the table above to the question posed to them by the researcher, it becomes clear to us that the sample members in a percentage (90%) believe that the weakness in project management which is one of the reasons related to the consulting services they have great effect that lead to delay in project completion , the other sample members in a percentage (7%) believe the factor that was inquired about it has a limited effect and the sample members in a percentage (3%) believe the factor that was inquired about it that has no effect .

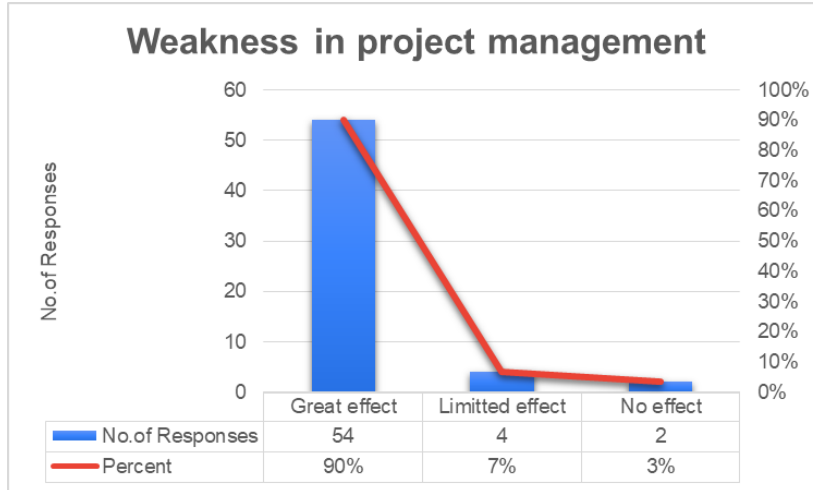


Figure 4.12: Weakness in Project Management.

iii. Engineers do not have enough experience.

Table 4.13: Engineers Do Not Have Enough Experience.

Options	No. of responses	Percent
Great effect	50	83%
Limited effect	9	15%
No effect	1	2%
Sum	60	100%

Through the answers of the sample members shown in the table above to the question posed to them by the researcher, it becomes clear to us that the sample members in a percentage (83%) believe that the engineers do not having enough experience which is one of the reasons related to the consulting services they have great effect that lead to delay in project completion , the other sample members in a percentage (15%) believe the factor that was inquired about it has a limited effect and the sample members in a percentage (2%) believe the factor that was inquired about it that has no effect.

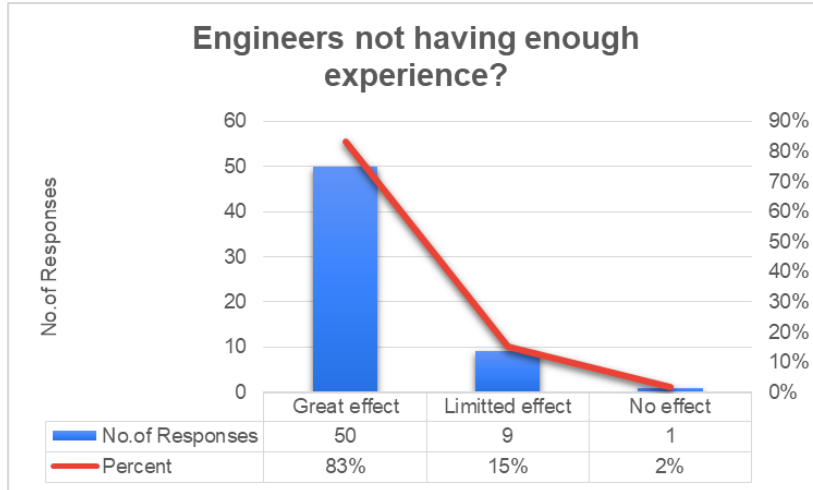


Figure 4.13: Engineers Do Not Have Enough Experience.

iv. Lack of interest in checking completed work

Table 4.14: Lack of Interest.

Options	No. of responses	Percent
Great effect	41	68%
Limited effect	17	28%
No effect	2	3%
Sum	60	100%

Through the answers of the sample members shown in the table above to the question posed to them by the researcher, it becomes clear to us that the sample members in a percentage (68%) believe that the Lack of interest in checking completed work which is one of the reasons related to the consulting services they have great effect that lead to delay in project completion , the other sample members in a percentage (28%) believe the factor that was inquired about it has a limited effect and the sample members in a percentage (3%) believe the factor that was inquired about it that has no effect .

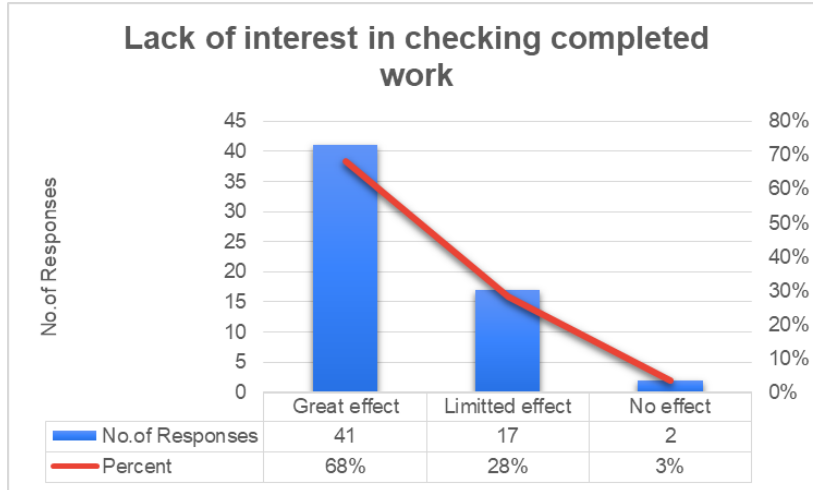


Figure 4.14: Lack of Interest.

d. Fourth Part

The researcher asked a question to the sample members about the extent of the effect of the reasons related to the contractor and lead to a delay in the project. The answers of the sample members to the reasons below were as follows :

i. Weak experience of the contractor in the field of building and construction

Table 4.15: Weak Experience.

Options	No. of responses	Percent
Great effect	49	82%
Limited effect	8	13%
No effect	3	5%
Sum	60	100%

After reviewing the results of the questionnaire by looking at the numbers of answers and percentages in the table above, the sample members whose their percent (82%) think that weak experience of the contractor in the field of building and construction has great effect on delaying the project , (13%) of the sample members think that the reason that was inquired about it has a limited effect and the sample members in a percentage (5%) believe the factor that was inquired about it that has no effect.

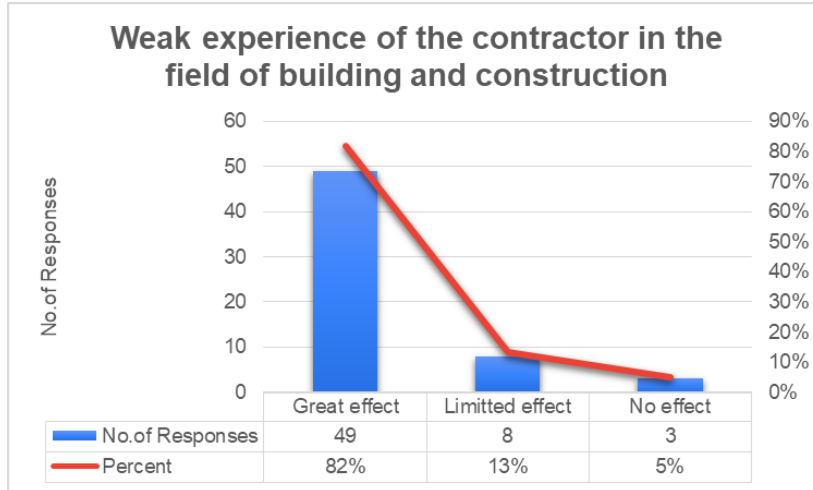


Figure 4.15: Weak Experience.

ii. Weakness in the management or follow-up of the site by the contractor

Table 4.16: Weakness in The Management.

Options	No. of responses	Percent
Great effect	43	72%
Limited effect	14	23%
No effect	3	5%
Sum	60	100%

After reviewing the results of the questionnaire by looking at the numbers of answers and percentages in the table above, the sample members whose their percent (72%) think that weakness in the management or follow-up of the site by the contractor has great effect on delaying the project , (23%) of the sample members think that the reason that was inquired about it has a limited effect and the sample members in a percentage (5%) believe the factor that was inquired about it that has no effect.

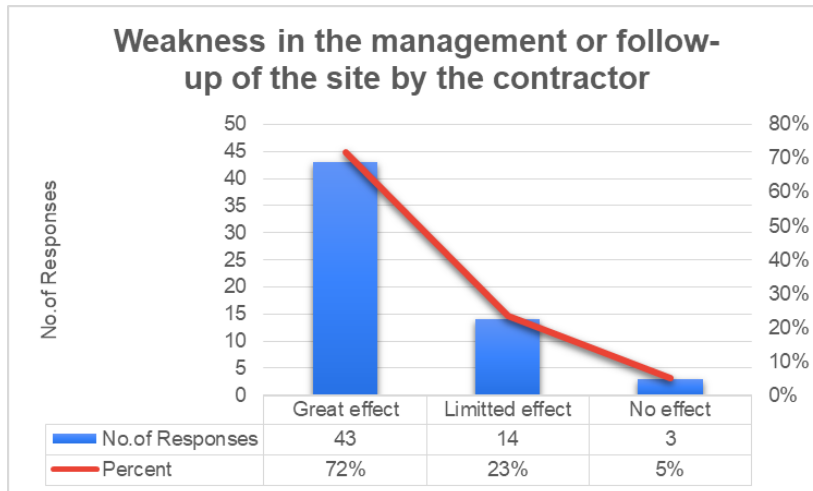


Figure 4.16: Weakness in The Management.

iii. The contractor was late in paying the subcontractor's wages.

Table 4.17: The Contractor Was Late in Paying The Subcontractor's Wages.

Options	No. of responses	Percent
Great effect	39	65%
Limited effect	18	30%
No effect	3	5%
Sum	60	100%

After reviewing the results of the questionnaire by looking at the numbers of answers and percentages in the table above, the sample members whose their percent (65%) think that the contractor was late in paying the subcontractor's wages has great effect on delaying the project , (30%) of the sample members think that the reason that was inquired about it has a limited effect and the sample members in a percentage (5%) believe the factor that was inquired about it that has no effect.

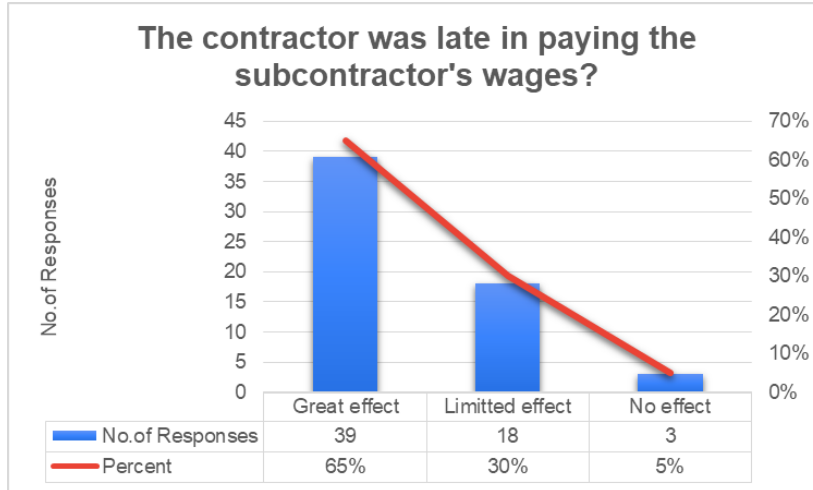


Figure 4.17: The Contractor Was Late in Paying The Subcontractor's Wages.

iv. Very optimistic scheduling

Table 4.18: Very Optimistic Scheduling.

Options	No. of responses	Percent
Great effect	31	52%
Limited effect	26	43%
No effect	3	5%
Sum	60	100%

After reviewing the results of the questionnaire by looking at the numbers of answers and percentages in the table above, the sample members whose their percent (52%) think that very optimistic scheduling has great effect on delaying the project , (30%) of the sample members think that the reason that was inquired about it has a limited effect and the sample members in a percentage (5%) believe the factor that was inquired about it that has no effect.

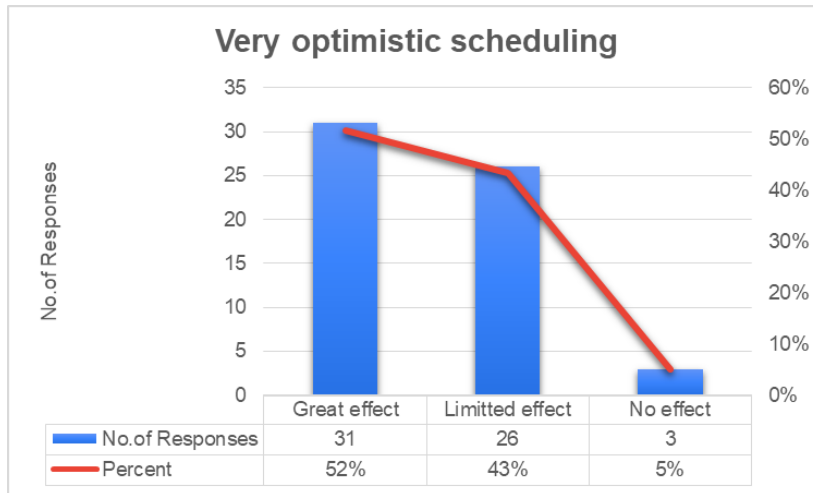


Figure 4.18: Very Optimistic Scheduling.

v. Make suggestions without thinking about the basic principle of design

Table 4.19: The Basic Principle of Design.

Options	No. of responses	Percent
Great effect	39	65%
Limited effect	15	25%
No effect	6	10%
Sum	60	100%

After reviewing the results of the questionnaire by looking at the numbers of answers and percentages in the table above, the sample members whose their percent (65%) think that make suggestions without thinking about the basic principle of design has great effect on delaying the project , (25%) of the sample members think that the reason that was inquired about it has a limited effect and the sample members in a percentage (10%) believe the factor that was inquired about it that has no effect.

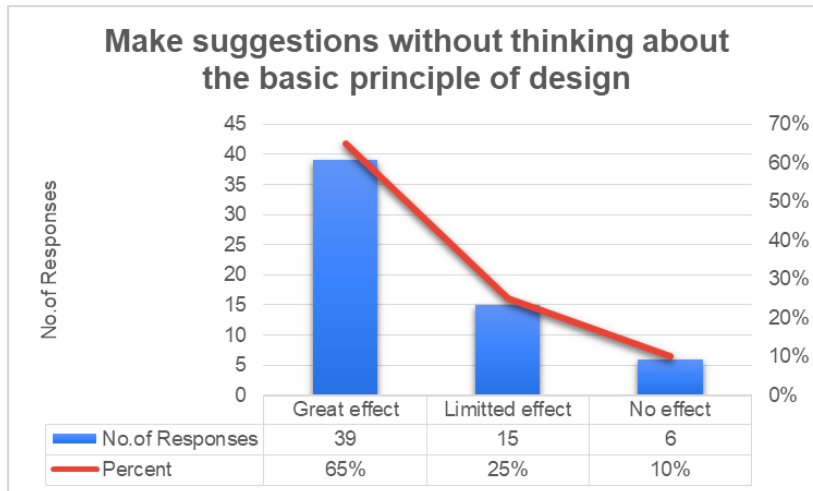


Figure 4.19: The Basic Principle of Design.

vi. The contractor's labor shortage

Table 4.20: The Contractor's Labor Shortage.

Options	No. of responses	Percent
Great effect	50	83%
Limited effect	9	15%
No effect	1	2%
Sum	60	100%

After reviewing the results of the questionnaire by looking at the numbers of answers and percentages in the table above, the sample members whose their percent (83%) think that he contractor's labor shortage has great effect on delaying the project , (15%) of the sample members think that the reason that was inquired about it has a limited effect and the sample members in a percentage (2%) believe the factor that was inquired about it that has no effect.

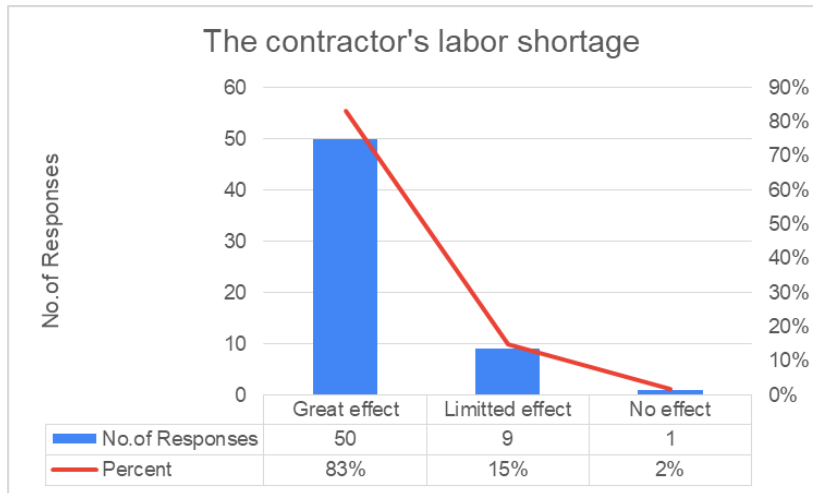


Figure 4.20: The Contractor's Labor Shortage.

vii. Errors in implementation

Table 4.21: Errors in Implementation.

Options	No. of responses	Percent
Great effect	52	87%
Limited effect	7	12%
No effect	1	2%
Sum	60	100%

After reviewing the results of the questionnaire by looking at the numbers of answers and percentages in the table above, the sample members whose their percent (87%) think that errors in implementation has great effect on delaying the project , (12%) of the sample members think that the reason that was inquired about it has a limited effect and the sample members in a percentage (12%) believe the factor that was inquired about it that has no effect.

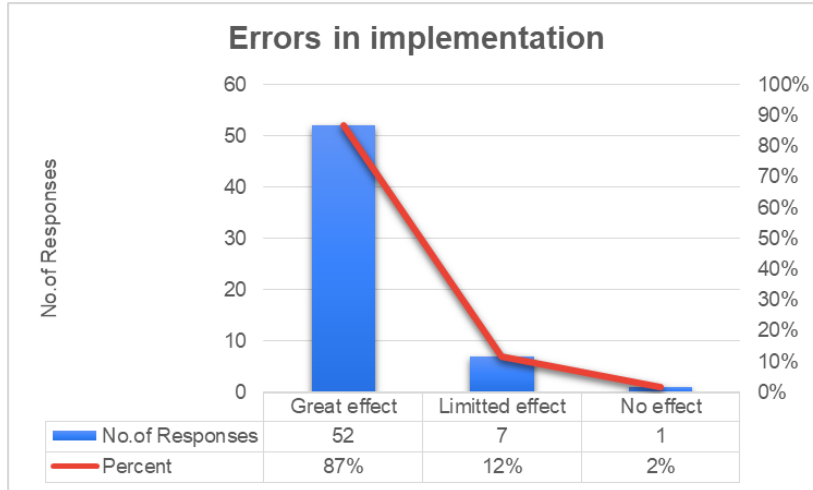


Figure 4.21: Errors in Implementation.

viii. Constantly changing subcontractors

Table 4.22: Constantly Changing Subcontractors.

Options	No. of responses	Percent
Great effect	45	75%
Limited effect	14	23%
No effect	1	2%
Sum	60	100%

After reviewing the results of the questionnaire by looking at the numbers of answers and percentages in the table above, the sample members whose their percent (75%) think that constantly changing subcontractors has great effect on delaying the project , (23%) of the sample members think that the reason that was inquired about it has a limited effect and the sample members in a percentage (2%) believe the factor that was inquired about it that has no effect.

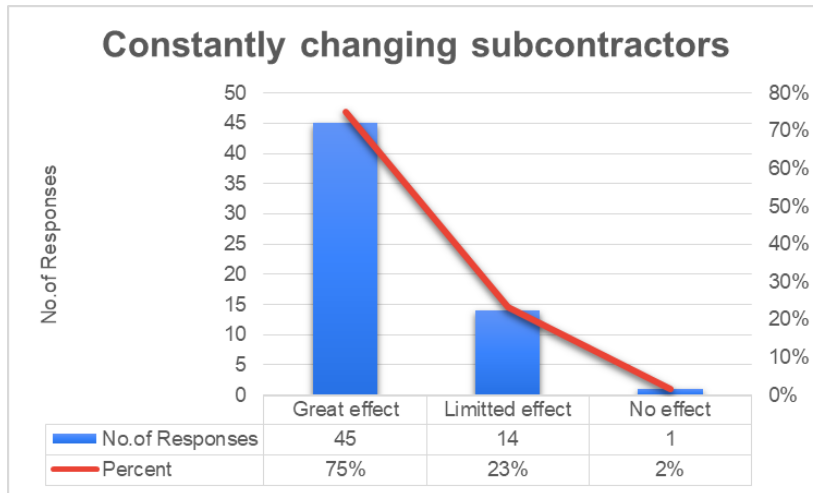


Figure 4.22: Constantly Changing Subcontractors.

e. Fifth part

The researcher asked a question to the sample members about the extent of the effect of the reasons related to the contract on the project time. The answers of the sample members to the reasons below were as follows :

i. Contract errors

Table 4.23: Contract Errors.

Options	No. of responses	Percent
Great effect	34	57%
Limited effect	20	33%
No effect	6	10%
Sum	60	100%

The respondents expressed their opinions about contract errors through their answers shown in the table above, as (57%) of them believe that they had a great effect that led to the delay of the project, and (33%) of them believe that the reason inquired about has a limited effect that leads to delaying the project and (10%) of them believe that the reason inquired about has no effect on delaying the project.

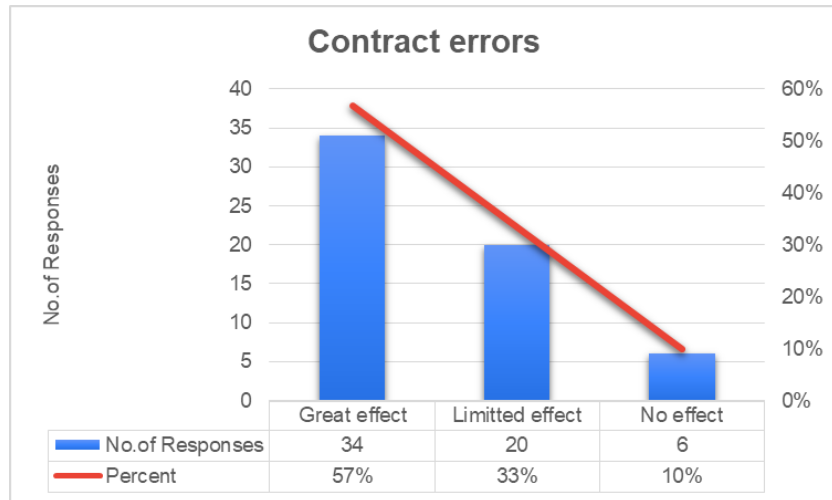


Figure 4.23: Contract Errors.

ii. Change in contract documents

Table 4.24: Change in Contract Documents.

Options	No. of responses	Percent
Great effect	28	47%
Limited effect	24	40%
No effect	8	13%
Sum	60	100%

The respondents expressed their opinions about change in contract documents through their answers shown in the table above, as (47%) of them believe that they had a great effect that led to the delay of the project, and (40%) of them believe that the reason inquired about has a limited effect that leads to delaying the project and (13%) of them believe that the reason inquired about has no effect on delaying the project.

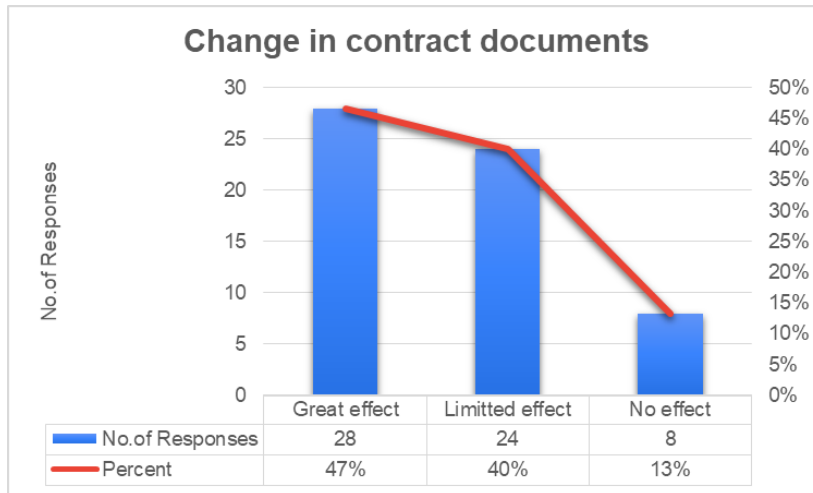


Figure 4.24: Change in Contract Documents.

iii. Contractual Disputes

Table 4.25: Contractual Disputes.

Options	No. of responses	Percent
Great effect	40	67%
Limited effect	17	28%
No effect	3	5%
Sum	60	100%

The respondents expressed their opinions about contractual disputes through their answers shown in the table above, as (67%) of them believe that they had a great effect that led to the delay of the project, and (28%) of them believe that the reason inquired about has a limited effect that leads to delaying the project and (5%) of them believe that the reason inquired about has no effect on delaying the project.

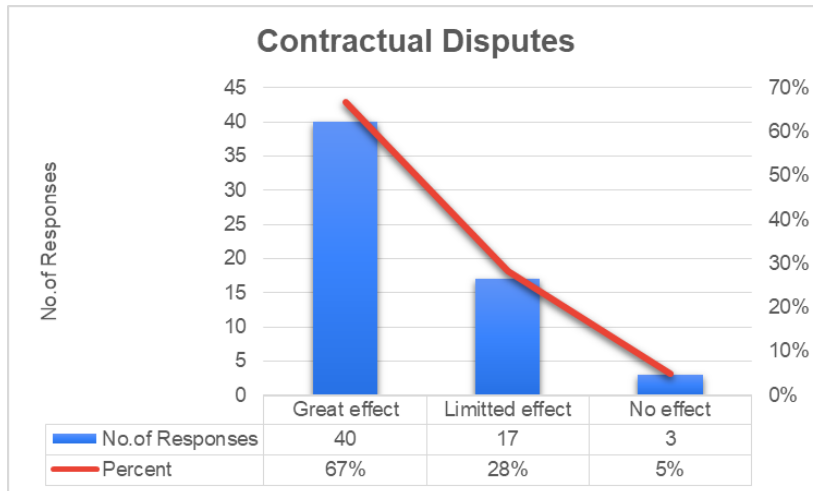


Figure 4.25: Contractual Disputes.

f. Sixth part

The researcher asked a question to the sample members about the extent of the effect of the reasons related to the materials affect the delay. The answers of the sample members to the reasons below were as follows :

i. On-site supply of materials

Table 4.26: On-Site Supply of Materials.

Options	No. of responses	Percent
Great effect	45	75%
Limited effect	14	23%
No effect	1	2%
Sum	60	100%

The respondents expressed their opinions about on-site supply of materials through their answers shown in the table above, as (75%) of them believe that they had a great effect that led to the delay of the project, , (23%) of them believed that the reason inquired about has a limited effect that leads to delaying the project and (2%) of them believe that the reason inquired about has no effect on delaying the project.

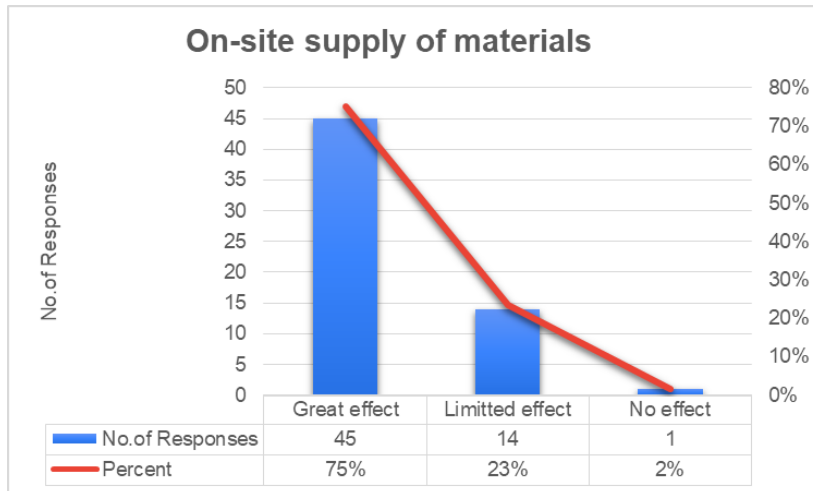


Figure 4.26: On-Site Supply of Materials.

ii. Material not conforming to the required specifications

Table 4.27: Material not Conforming to The Required Specifications.

Options	No. of responses	Percent
Great effect	46	77%
Limited effect	13	22%
No effect	1	2%
Sum	60	100%

The respondents expressed their opinions about material not conforming to the required specifications through their answers shown in the table above, as (77%) of them believe that they had a great effect that led to the delay of the project, (22%) of them believed that the reason inquired about has a limited effect that leads to delaying the project and (2%) of them believe that the reason inquired about has no effect on delaying the project.

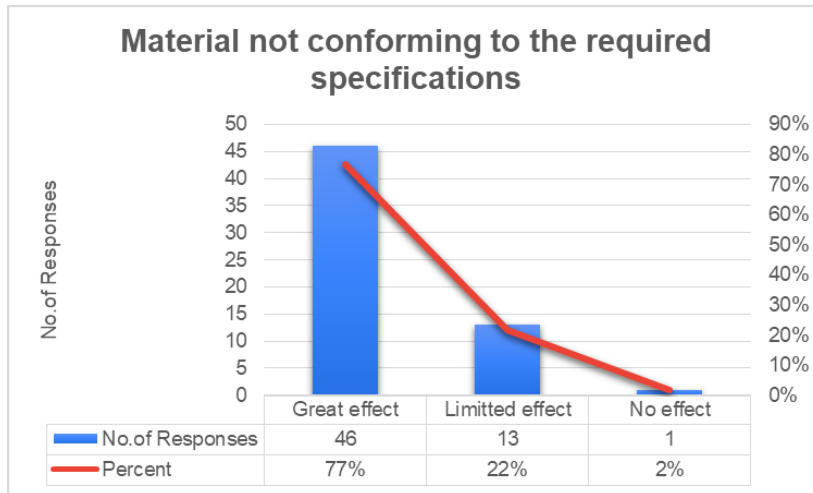


Figure 4.27: Material not Conforming to The Required Specifications.

iii. Material prices fluctuate significantly during implementation

Table 4.28: Material Prices Fluctuate Significantly During Implementation.

Options	No. of responses	Percent
Great effect	47	78%
Limited effect	12	20%
No effect	1	2%
Sum	60	100%

The respondents expressed their opinions about the material prices fluctuate significantly during implementation through their answers shown in the table above, as (78%) of them believe that they had a great effect that led to the delay of the project, (20%) of them believed that the reason inquired about has a limited effect that leads to delaying the project and (2%) of them believe that the reason inquired about has no effect on delaying the project .

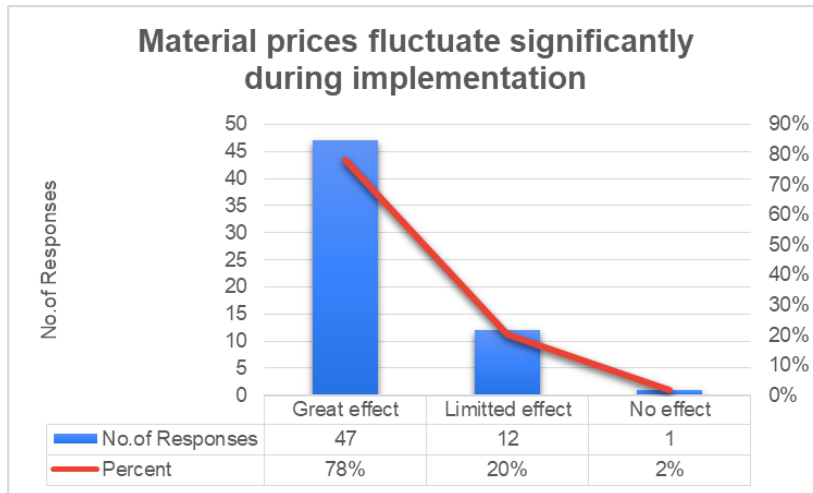


Figure 4.28: Material Prices Fluctuate Significantly During Implementation.

g. Seventh part

The researcher asked a question to the sample members about the extent of the effect of the reasons related to the to the work staff affect the delay. The answers of the sample members to the reasons below were as follows :

i. Lack of trained professional human resources

Table 4.29: Lack of Trained Professional Human Resources.

Options	No. of responses	Percent
Great effect	48	80%
Limited effect	9	15%
No effect	3	5%
Sum	60	100%

The respondents expressed their opinions about the lack of trained professional human resources through their answers shown in the table above, as (80%) of them believe that they had a great effect that led to the delay of the project, (15%) of them believed that the reason inquired about has a limited effect that leads to delaying the project and (5%) of them believe that the reason inquired about has no effect on delaying the project.

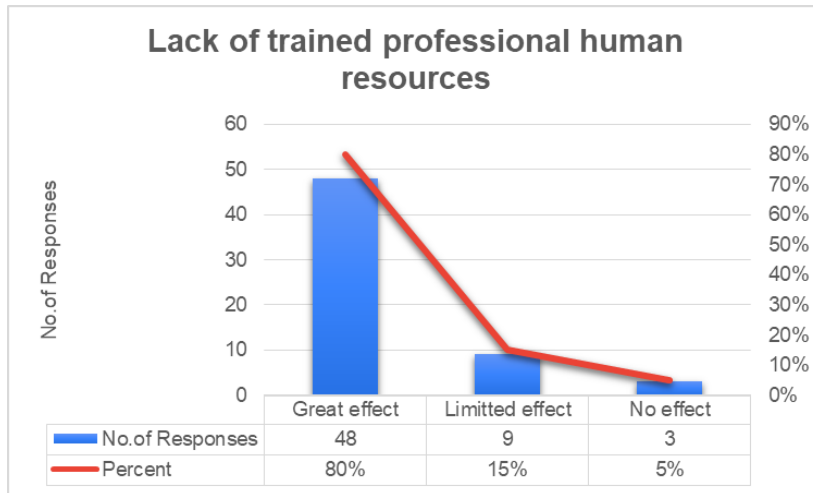


Figure 4.29: Lack of Trained Professional Human Resources.

ii. Skilled labor is not enough

Table 4.30: Skilled Labor is Not Enough.

Options	No. of responses	Percent
Great effect	52	87%
Limited effect	6	10%
No effect	2	3%
Sum	60	100%

The respondents expressed their opinions about the skilled labor are not enough through their answers shown in the table above, as (87%) of them believe that they had a great effect that led to the delay of the project, (10%) of them believed that the reason inquired about has a limited effect that leads to delaying the project and (3%) of them believe that the reason inquired about has no effect on delaying the project.

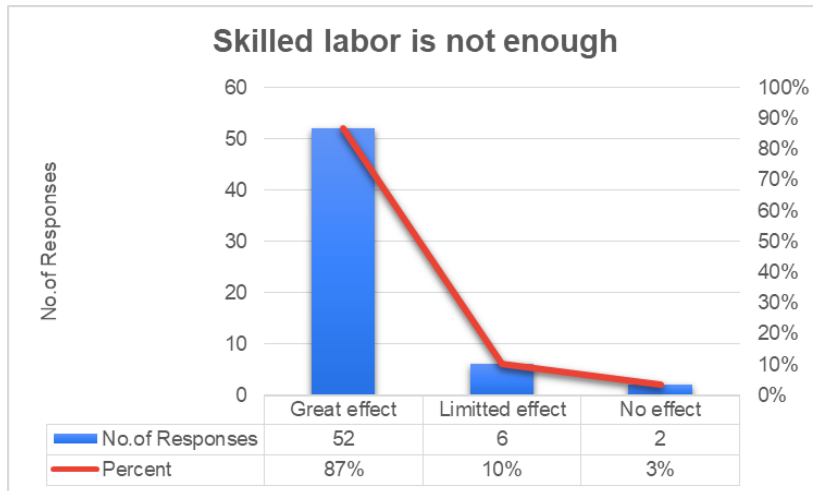


Figure 4.30: Skilled Labor is not Enough.

iii. Lack of motivation in the workplace

Table 4.31: Lack of Motivation in The Workplace.

Options	No. of responses	Percent
Great effect	39	65%
Limited effect	18	30%
No effect	3	5%
Sum	60	100%

The respondents expressed their opinions about the lack of motivation in the workplace through their answers shown in the table above, as (65%) of them believe that they had a great effect that led to the delay of the project, (30%) of them believed that the reason inquired about has a limited effect that leads to delaying the project and (5%) of them believe that the reason inquired about has no effect on delaying the project.

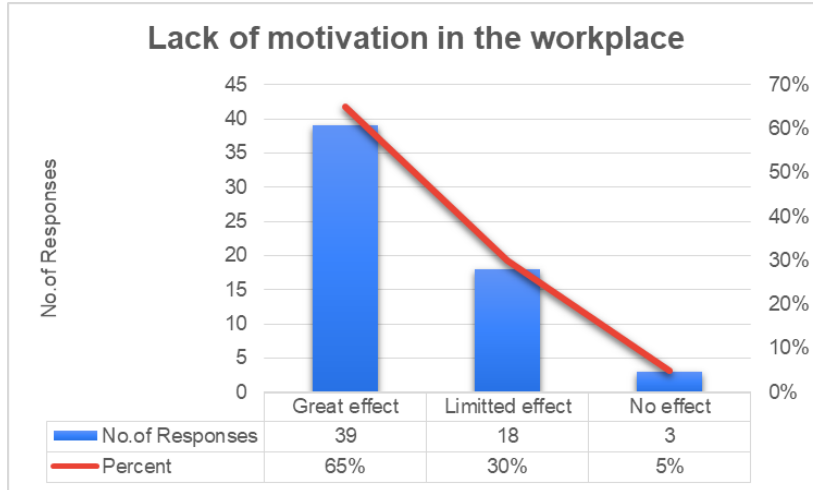


Figure 4.31: Lack of Motivation in The Workplace.

h. Eighth part

The researcher asked a question to the sample members about the extent of the effect of the reasons related to the to the equipment that affect the delay. The answers of the sample members to the reasons below were as follows :

i. Delay due to equipment

Table 4.32: Delay Due to Equipment.

Options	No. of responses	Percent
Great effect	50	83%
Limited effect	8	13%
No effect	2	3%
Sum	60	100%

We note from the answers shown in the table above that the respondents expressed their opinion regarding the extent to which the equipment affected the delay in the project according to the following percentages , as (83%) of them think that they had a great effect that led to the delay of the project, (13%) of them think that the reason inquired about has a limited effect that leads to delaying the project and (3%) of them think that the reason inquired about has no effect on delaying the project .

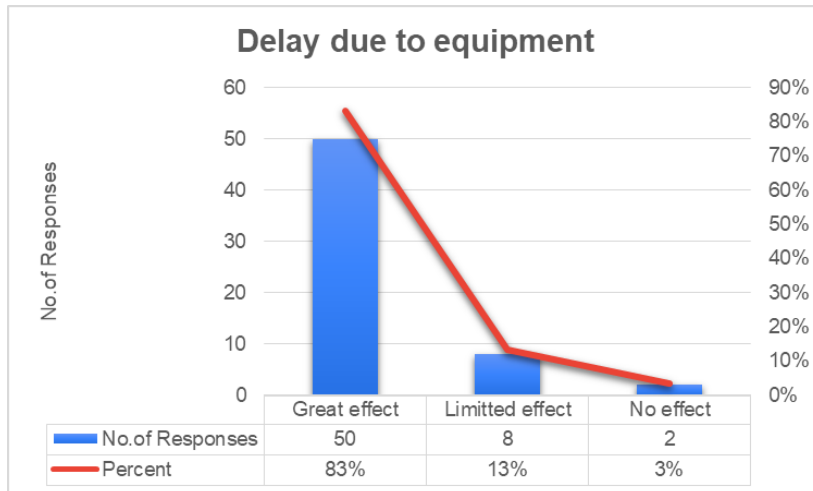


Figure 4.32: Delay Due to Equipment.

ii. Equipment shortage

Table 4.33: Equipment Shortage.

Options	No. of responses	Percent
Great effect	45	75%
Limited effect	13	22%
No effect	2	3%
Sum	60	100%

We note from the answers shown in the table above that the respondents expressed their opinion regarding the extent to which the equipment shortage affected the delay in the project according to the following percentages , as (75%) of them think that they had a great effect that led to the delay of the project, (22%) of them think that the reason inquired about has a limited effect that leads to delaying the project and (3%) of them think that the reason inquired about has no effect on delaying the project.

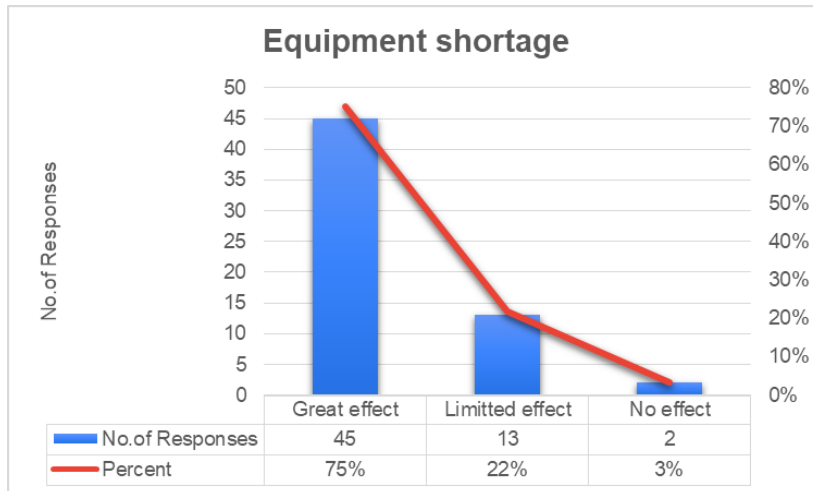


Figure 4.33: Equipment Shortage.

iii. Neglecting periodic maintenance of equipment

Table 4.34: Neglecting Periodic Maintenance of Equipment.

Options	No. of responses	Percent
Great effect	41	68%
Limited effect	17	28%
No effect	2	3%
Sum	60	100%

We note from the answers shown in the table above that the respondents expressed their opinion regarding the extent to which neglecting periodic maintenance of equipment affected the delay in the project according to the following percentages , as (68%) of them think that they had a great effect that led to the delay of the project , (28%) of them think that the reason inquired about has a limited effect that leads to delaying the project and (3%) of them think that the reason inquired about has no effect on delaying the project.

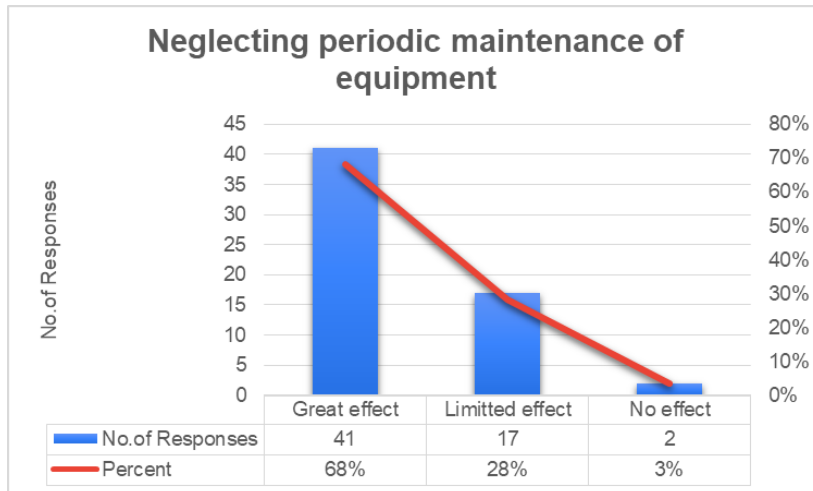


Figure 4.34: Neglecting Periodic Maintenance of Equipment.

iv. The equipment does not match the type of work required

Table 4.35: The Equipment Does Not Match The Type of Work Required.

Options	No. of responses	Percent
Great effect	45	75%
Limited effect	13	22%
No effect	2	3%
Sum	60	100%

We note from the answers shown in the table above that the respondents expressed their opinion regarding the extent to which the equipment does not match the type of work required affected the delay in the project according to the following percentages , as (75%) of them think that they had a great effect that led to the delay of the project , (22%) of them think that the reason inquired about has a limited effect that leads to delaying the project and (3%) of them think that the reason inquired about has no effect on delaying the project .

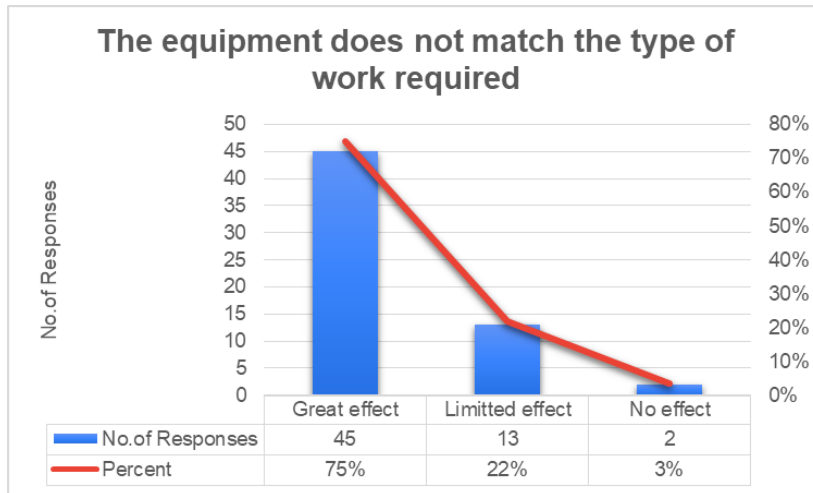


Figure 4.35: The Equipment does not Match The Type of Work Required.

i. Ninth part

The researcher asked a question to the sample members about the consequences of delaying the project. The answers of the sample members were as follows

i. Delay in project delivery

Table 4.36: Delay in Project Delivery.

Options	No. of responses	Percent
Great effect	49	82%
Limited effect	9	15%
No effect	2	3%
Sum	60	100%

The sample members expressed their opinion about the consequences of the delay in the project, and their opinion was about the delay in project delivery according to the following percentages : (82%) percent of the sample members think that the delay has great effect on the project delivery, (15%) percent of the sample members think that the delay has limited effect on the project delivery and (3%) percent of the sample members think that the delay has no effect on the project delivery . The higher proportion of answers was in favor of the fact that delays have a great effect on the timely and proportionate delivery of the project,

which is the most detrimental consequence, entailing many losses and problems for the parties. The project, the longer the delay, the lower the profits and the higher the risks.

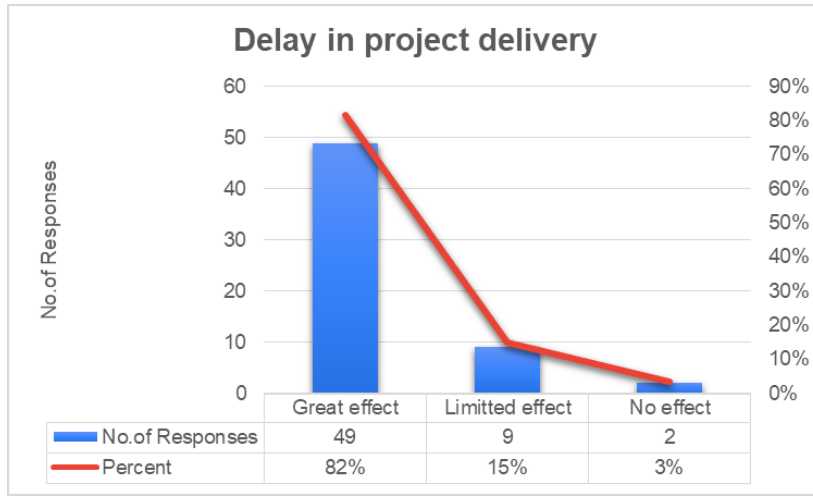


Figure 4.36: Delay in Project Delivery.

ii. Cost increase

Table 4.37: Cost Increase.

Options	No. of responses	Percent
Great effect	52	87%
Limited effect	7	12%
No effect	1	2%
Sum	60	100%

The sample members expressed their opinion about the consequences of the delay in the project, and their opinion was about the delay in project delivery according to the following percentages : (87%) percent of the sample members think that the delay has great effect on the project delivery, (12%) percent of the sample members think that the delay has limited effect on the project delivery and (2%) percent of the sample members think that the delay has no effect on the project delivery . The delay in implementing the project and the delay in its delivery within the agreed contractual period leads to an increase in the cost and many losses to the contractor due to the high prices of local markets and labor wages and the

imposition of delay fines and other consequences that lead to an increase in the cost required to implement the project, and thus large material losses to the project parties

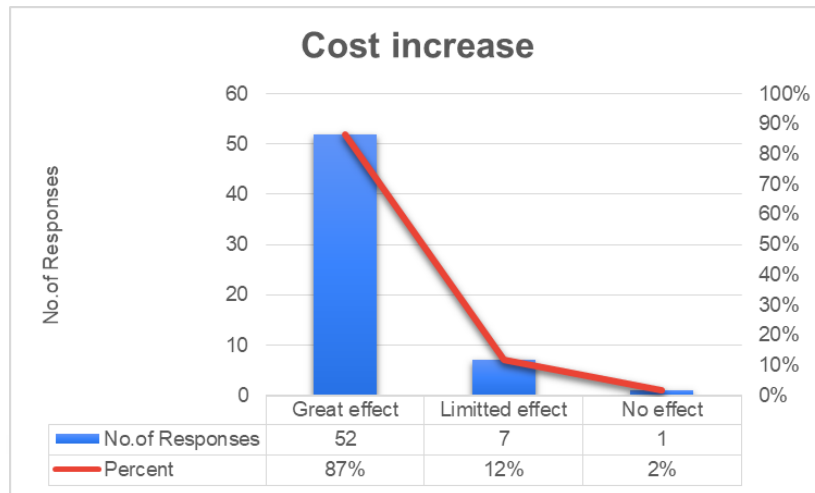


Figure 4.37: Cost Increase.

iii. Disputes and arbitration

Table 4.38: Disputes and Arbitration.

Options	No. of responses	Percent
Great effect	48	80%
Limited effect	11	18%
No effect	1	2%
Sum	60	100%

The sample members expressed their opinion about the consequences of the delay in the project, and their opinion was about the disputes and arbitration according to the following percentages : (80%) percent of the sample members think that the delay has great effect on the project delivery , (18%) limited effect and (2%) think that there is no effect . The issue of delay in construction projects is one of the most important causes of conflict between the owner and the contractor, due to the large size of the negative consequences of delay. Therefore, we find that most of the contracting contracts include clauses stressing the necessity of commitment to implementation within the time period specified in the contract

and according to the work progress schedule established by the two parties to avoid claims and disputes .

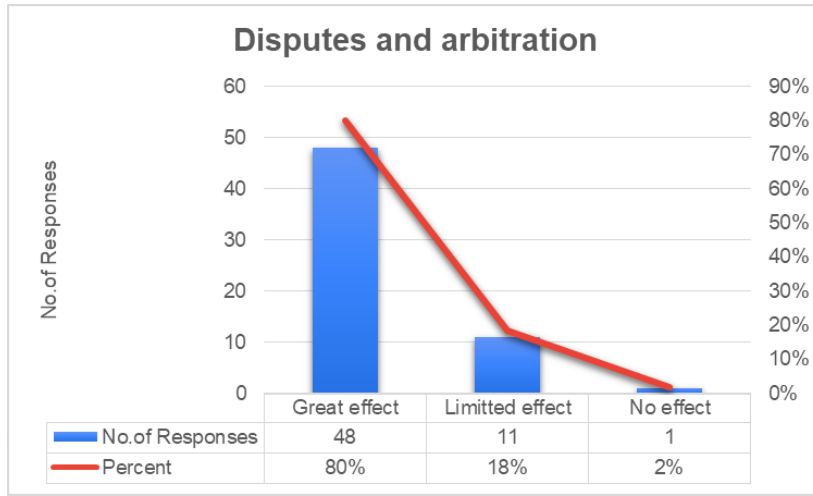


Figure 4.38: Disputes and Arbitration.

iv. Project financing

Table 4.39: Project Financing.

Options	No. of responses	Percent
Great effect	53	88%
Limited effect	5	8%
No effect	2	3%
Sum	60	100%

The sample members expressed their opinion about the consequences of the delay in the project, and their opinion was about the project financing according to the following percentages: (88%) percent of the sample members think that the delay has great effect on the project delivery, (8%) limited effect and (3%) think that there is no effect. The failure to complete the project on time specified in the contract is the failure to achieve one of the most important objectives of the project, which is its completion on time. Therefore, the delay has negative repercussions on the project financing because the project works are linked to costly

elements such as labor, equipment and financial financing. Any delay has many damages to the contractor and the owner.

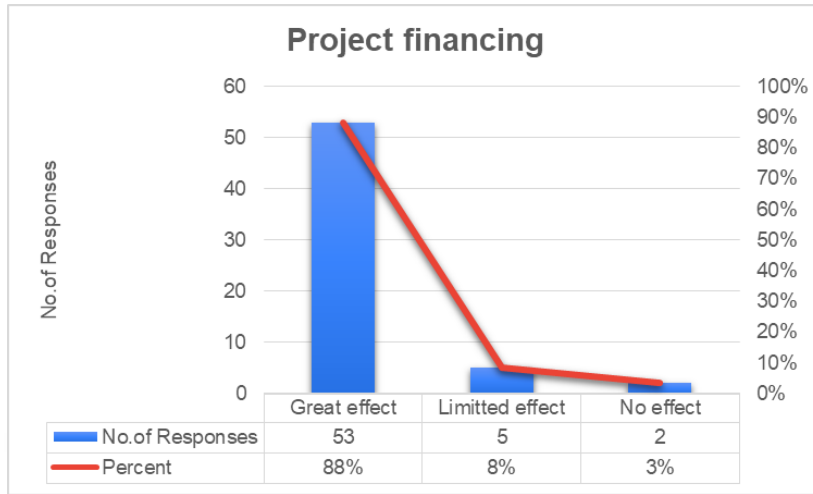


Figure 4.39: Project Financing.

v. Insufficient funding

Table 4.40: Insufficient Funding.

Options	No. of responses	Percent
Great effect	53	88%
Limited effect	6	10%
No effect	1	2%
Sum	60	100%

The sample members expressed their opinion about the consequences of the delay in the project, and their opinion was about the disputes and arbitration according to the following percentages : (80%) percent of the sample members think that the delay has great effect on the project delivery , (18%) limited effect and (2%) think that there is no effect. The negative consequences of the delay continue, as it sometimes entails financial compensation that leads to insufficient funding for the project, and this compensation is a type of fines established in the contract and agreed upon by the two parties to the contract when signing the contract. These consensual compensations are limited to a specific amount that may be less or More

than the actual value of the damage incurred is assumed in this type of contract, if any, that there will be good intentions on the part of the parties when the cause of the delay occurs..

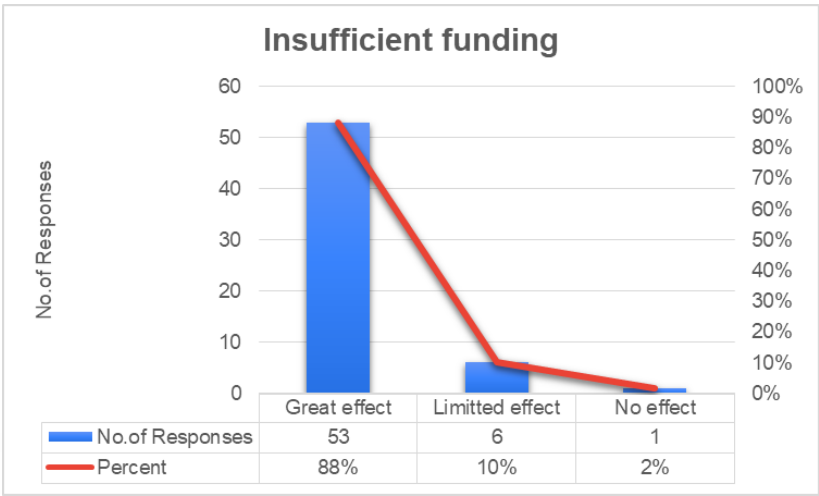


Figure 4.40: Insufficient Funding.

4.3 SUMMERY

The findings presented solutions to the thesis problem and measures institutions should take to deal with their challenges based on the experts' specialties and activities. After reading the chapter, experts in their field of work were able to create good outcomes by electronically responding to questions that were given to them.

5. CONCLUSION AND FUTURE WORKS

5.1 CONCLUSION

As we draw the curtains on this study, it becomes crystal clear that construction delays in Iraq remain a formidable challenge that requires prompt attention. The in-depth analysis of the root causes of these delays, as well as the perception of clients, consultants, and contractors on this issue, has revealed that financial constraints, scheduling difficulties, and equipment-related problems are the leading culprits.

To combat these challenges, there is a dire need for Iraqi contracting companies to embrace a revolutionary approach - the Total Quality Management (TQM) system. This innovative system places a premium on quality in all stages of the construction process, from planning to execution. With TQM, companies can identify and tackle the underlying causes of delays, bolster their communication and collaboration, and continuously improve their processes.

The findings of this study, thus, underscore the importance of TQM as a game-changer for Iraqi contracting companies seeking to enhance their performance and overcome industry hurdles. By adopting TQM, these companies can meet and exceed their clients' expectations, boost their competitiveness, and increase their profitability.

In light of this, it is our strong recommendation that Iraqi contracting companies take a proactive approach and embrace TQM to surmount the construction industry's obstacles. By doing so, they can transform their performance and reputation in the industry and pave the way for a more prosperous future.

This study examined the reasons for Iraq's construction delays. The researcher investigated the root of the problem. The three main groups of participants, clients, consultants, and contractors were asked to fill out questionnaires. For this study, researchers surveyed Iraqi construction project delays and their perceptions of the variables contributing to them. The 35 different delay features found in the literature were grouped into nine primary categories and rated according to importance. According to the researcher's findings, clients, consultants, and contractors all agreed that the most significant delay issue was financial. Regarding delays in building projects, scheduling and controlling issues were ranked second only to equipment-related factors, which were ranked third. There is a 65.4% agreement

between clients and contractors and a 57.9% agreement between contractors and consultants based on Spearman's rank values.

5.2 FUTURE WORKS

In building project management, the need for adequate and timely financial resources cannot be overstated. Everything relies on enough money. Everything connected to construction is negatively impacted by an absence of sufficient cash flow. Workers' morale has plummeted because of irregular or non-payment of wages, which has contributed to the project's delays. It's up to clients and building owners to figure out how to minimize the impact of a financial crisis on the construction process. Furthermore, the following recommendations were made:

- a. The idea of instituting a commercial bank for construction is worth reconsidering so that contractors can have access to credit when liquidity problems arise.
- b. Construction clients or project owners must ensure that funds are readily available and accessible or sufficient preparations for funds are made before starting the project.
- c. The long and administrative procedures involved in honoring payments to contract are a major concern for clients and project owners.

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