



**Assessment of the Challenge and opportunity of design and build project delivery system: The case study on Abay bank head quarter building**

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**Approved by Board of Examiners**

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## **Abstract**

*The owner contracts with a single business to undertake both the design and construction work in a design-build project method. The DB construction project delivery method seeks to expedite the construction contracting process by consolidating the design and construction responsibilities for a project into a single contract. One of the newest bank headquarters building projects, Abay, is being built using a design-build delivery method. Design-build projects present unique opportunities and challenges. This study aims to investigate the opportunities and difficulties associated with the design-build delivery method for the Abay Bank headquarters project. The study was of the descriptive research kind, and the necessary data was gathered through interviews and questionnaires. Both qualitative and quantitative data collection was used in the study. The population size of this study is twenty-one and census sampling technique was used in this study. Employee of contractor, consultant and client representative are participants of this study. The qualitative analysis was executed First, the data were sorted, topics were searched for, coding was done, a coding system was created, a code scheme was used, and the findings were analyzed and interpreted. The study's findings indicate that the primary obstacles facing the design-build delivery system include issues with coordination and communication, unforeseen delays or cost overruns, concerns with risk distribution, and the client's hasty decision-making. The study's findings also demonstrate the benefits of a design-build delivery system, which include accountability, less administrative work, better risk management, and single-source accountability. The study's conclusions are crucial for the company's next initiatives and close the empirical evidence gap at Abay Bank. According to the study, it is crucial to develop a communication strategy that outlines the responsibilities, roles, and procedures for each stakeholder, including the client, designer, contractor, and subcontractors. It also suggests that there should be continuous communication and a clear definition of risk allocation in the Design-Build contract, as well as who is responsible for delays, unanticipated site conditions, and design errors. The report suggests that more investigation be done into a cost-benefit analysis that contrasts the Design-Build delivery approach with conventional design-bid-build for projects of a similar nature at Abay Bank.*

*Key Words: Design build, project delivery system, Design bid build*

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## **Acronyms and Abbreviations**

DB: Design Build

DBB: Design Bid Build

DBIA: Design-build Institute of America

DOT: State Departments of Transportation:

NEPA: National Environmental Policy Act

# CHAPTER 1: INTRODUCTION

## 1.1 Background of the study

In a design-build project delivery system, the owner enters into a contract with a single company that handles both the design and construction work. The design-build company may handle these services entirely, or it may handle some of them through subcontractor agreements(El Wardani et al., 2006). The design-build approach, which has been shown to be an efficient delivery strategy, has gained popularity recently worldwide(Xia et al., 2009)

By combining the design and construction duties for a project into a single contract, the DB construction project delivery method aims to streamline the construction contracting process. Owners in the public and private sectors today require single-source project management as opposed to the traditional decentralized design-bid-build manner of project delivery(Goldberg, 1999a) Design builders are an essential component of the delivery process as a major stakeholder in DB projects since they assume complete responsibility for both design and construction as well as management(Xia et al., 2009). Under the terms of the DB contract, the design-builder takes "ownership" of the design details and is consequently accountable for producing defect-free design papers and a constructed facility(ASCE Committee on Specifications, 2008)

Although employing design-build delivery systems has many benefits, there are drawbacks to these methods as well. Numerous domestic and international studies show that projects using DB perform better than average, but they also reveal that certain project characteristics are red flags that a project might not be a good fit for DB delivery(Gransberg et al., 2006)

One of the newest banks to enter the competition to construct the next major bank headquarters is Abay Bank, which has invested 3,036,000,000.00ETB. VAT included. The Abay Bank Head Quarter Building Project is situated in Addis Ababa, Ethiopia, and comprises 27 stories above ground, three basement levels, and G and M floors. There is 40,000 m<sup>2</sup> of construction space overall.

The bank engaged China Wu Yi, a Chinese construction and engineering firm, to design and build the building. This company was previously awarded the contract to build Zemen Bank, the Cooperative Bank of Oromia headquarters, the Daye-Chiri-Nansebo road, and a 48-kilometer road connecting Afdero and Erebti intersection. The project includes a pump house,

a fire command centre, a gallery, a fitness facility, a UPS room, a security room, a driver chamber, a generator room, and a roof.

This study is crucial because it identifies the possibilities and challenges associated with employing the design-build delivery system, which will have a bearing on future building construction.

The study also provides information for upcoming studies on the advantages and disadvantages of the design-build delivery method.

## **1.2 Statement of the problem**

The design-build delivery method is now often employed on various projects. On the other hand, the administration of this delivery system is not well understood. Due to their adaptation of this delivery mechanism without a thorough understanding of its limitations, many projects encounter several difficulties. The choice of project delivery mechanism is a critical issue for construction professionals and owners alike. The primary goals of any construction project are quality, safety, cost, and time of execution. All of these factors are impacted by this decision. Typically, the owner makes the decision based on a number of variables, including the project's particular characteristics, the owner's aim, the degree of risk, the amount of information needed or available at the time of construction, the desired level of client involvement, and the interaction between design and construction(Sameh Monir El-Sayegh, 2016).

The goal of adopting design-build as a project delivery approach is to increase performance. Few prior research has addressed the design and construction coordination challenges that new users are likely to confront during implementation. Most previous studies have concentrated on the upstream issues, such as adoption circumstances and contractor selection. Two key issues that have been identified to have a high influence on database execution are the inconsistent implementation of the design and building process and the infrequent feedback.(Andrew S.Chang, et al., 2010)

Ethiopian banks are currently constructing tall structures that serve as statements of their goals and objectives. One of the banks that is currently erecting high-rise buildings is Abay Bank. Delivery systems of the design-built variety are the kind in question. Although design build (DB) has the potential to boost productivity, speed of completion, and cost-effectiveness, they also pose special issues for stakeholders. When evaluating DB systems for project delivery, it

is essential to comprehend these potential and challenges in order to make an informed conclusion.

Therefore, the purpose of this study is to assess the challenge and benefits of DB delivery system at Abay bank head quarter building construction project.

### **1.3 Research questions**

The study sought to explore the following research questions:

- What are the key challenges associated with implementing DB project delivery systems on Abay headquarter building project and how can these challenges be mitigated or overcome?
- What are the potential opportunities and benefits of using DB project delivery systems on Abay headquarter building project?

### **1.4 Research objectives – general and specific**

#### **1.4.1 Main Objective**

Examining the potential and difficulties of implementing a design-build delivery system on the Abay headquarters building is the primary goal of the project.

#### **1.4.2 Specific Objective**

The specific objective of the study is:

- ✓ To identify and examine the major challenges encountered in implementing design build delivery system on Abay headquarter building project.
- ✓ To propose strategies for mitigation or overcoming these challenges.
- ✓ To assess the potential benefit and opportunity of using design build delivery system on Abay headquarter building project.

### **1.5 Significance of the study**

Changing the design-build delivery method offers benefits and drawbacks of its own. This study helps to determine the benefits and drawbacks of applying a design-build delivery system to the construction of the Abay headquarters. It provides information to project delivery stakeholders on the possible advantages and disadvantages of design build delivery systems.

This will assist in managing the difficulties brought on by this delivery system and in making the most of the opportunity.

### **1.6 Scope of the study**

This study sought to understand the challenge and opportunity of design build delivery system on Abay headquarter building project. The study targeted project managers, contract admins, coordinators and Engineers who are currently participating from the staff of the client, consultant and the contractor.

### **1.7 Limitations of the study**

The building of the Abay headquarters is the exclusive subject of the study. Consequently, it is impossible to generalise about how the potential and difficulty of the design-build delivery method apply to any design-build project. For comparable projects at Abay Bank, more study should be done on a cost-benefit analysis contrasting the Design-Build delivery method with conventional design-bid-build. This can assist in figuring out the most economical course of action for next projects and investigate the wider application of Design-Build at Abay Bank.

### **1.8 Organization of the study**

This project work is organized in five chapters, chapter one provides background of the study, the problem statement, the study objective, the research questions, significance of the study, scope of the study and limitation of study. Chapter two focuses on review of related literature on challenges and opportunities of design build delivery system, which covers both theoretical and empirical literature and conceptual framework presented. Chapter three covers the research approach and methodology to achieve the research objective of the study. The analysis of findings and discussion part are included in chapter four. The last chapter provides conclusion and recommendations based on the research findings.

### **1.9 Definition of key terms**

- ✓ **Design-Build (DB):** A project delivery method where a single entity assumes responsibility for both design and construction of a project.
- ✓ **Design-Bid-Build (DBB):** A traditional project delivery method where design and construction are separate phases, with separate contracts awarded to different entities.
- ✓ **Project Delivery System:** The overall process for planning, designing, and constructing a project.

## **CHAPTER 2: LITERATURE REVIEW**

### **2.1 Introduction**

This chapter presents and explores the study of theoretical literature reviews related with challenges and opportunities of using design build delivery system.

### **2.2 Conceptual Review**

#### **2.2.1 Design build Delivery system**

Project delivery method refers to the owner's approach in organizing the project team that will manage the entire design and construction. It's also defined as acquisition process, relationships, roles and responsibilities of the project team and the sequence of events to deliver the facility. Depending on what project delivery method is chosen as the acquisition process, roles and responsibilities of team members and the sequence of activities is different(Allen,L.N., 2001).There are several delivery methods that can be used on construction projects. They can be categorized in three groups: Traditional design-bid-build, Construction management and design-build. Selecting the appropriate delivery method is a key factor in achieving project objectives and project success(Sameh Monir El-Sayegh, 2016).Design build is a project delivery method in which the owner/client selects an organization that will complete both the design and construction under one agreement. Upon completion, the owner is then responsible for all the financing aspect(Pakkala, 2002).In the 1970s the design build concept first became an organized and accepted approach to project delivery, primarily in private sector construction. The evolution from an ancient concept to a contemporary format was driven by owners seeking ways to reduce the time cycle for design and construction, which in turn reduced the risk and effect of economic inflation on project budgets and financing(Goldberg, 1999a).

The design-builder is responsible to design and construct the project to meet the performance standard set forth by the owner in the contract(employers requirement).With respect to any perspective design or specifications, the design builder is responsible for discovering any inconsistency between the prescriptive requirements and the performance standards and the owner remains responsible for the cost to reconcile the inconsistent standard(Tesfaye Likisa, 2020).The design-build Institute of America (DBIA) believes that the majority of non-residential construction projects will be delivered using DB IN 2010(Eby M, 2005).Additionally, a survey in 2004 found that construction that construction companies expected 50% of their revenues to come from DB projects in 2006(Zweig-White, 2004).That

survey also found that 80% of all design and construction firm surveyed in the United states expected an increase in their business derived from DB projects over the next five years.

### **2.2.1.1 Advantage of DB**

When the designer and the contractor are members of the same team, design decisions can be made quickly and in a more congenial atmosphere, even after construction has commenced. Likewise, construction decisions can be made early in the design process, thus minimizing delays and cost overruns. Although the design-builder has the responsibility for both the design and construction of a project, owners can become actively involved in the design process(Robert F.Cushman, 1992).

In their study "Challenges and Opportunities for Accelerating Environmental Analysis in Transportation Design-Build Projects," David Hannon, Kia Mostaan, and Baabak Ashuri separated the opportunity of the design-build delivery system into four phases: concept, preliminary design, procurement, and post-award.

### **Concept Phase**

In the project concept phase the following two best practices can be considered as opportunities for efficiency enhancement in design-build projects

*Opportunity 1: Leaders of state agencies at the seven DOTs should collaborate, provide funding for, or share space with regulatory agencies.*

The process of collaborating will guarantee that the agency and the state DOT have the same understanding of the project's objectives. The consultants on the design-build teams who actually coordinate with the regulatory bodies have an incentive to keep good relationships going, state DOTs and regulatory agencies have discovered. upcoming design-build and design-bid-build projects in collaboration with this agency. For any project including complicated environmental permits, early and regular collaboration has been found to be optimal(Parametrix,Inc. & Venner consulting, 2012).

*Opportunity 2: State Departments of Transportation should have the adaptability to use a variety of tactics to obtain environmental approvals.*

State Departments of Transportation (DOTs) have determined that starting environmental permitting chores early in the concept phase—when they are known to have a significant lead

time—will lessen their impact on the project's critical path. The design-build team should assume all risk connected with altering the permit when it is obtained beforehand by the state Department of Transportation. Three important tactics for state DOTs that should be recognised in the idea phase are as follows: these should be highlighted by the content analysis of various reports, design-build project requests for proposals, and interviews with six state DOTs(Louis Berger Group,Inc., 2007).

- Getting permissions before hiring the design-build team and making sure they fulfil all obligations under the permit
- Obtaining permissions subsequent to the design-build team's acquisition and coordinating implications and permit needs in accordance with their projected design
- Make the design-build team responsible for preparing all permits on the state DOT's behalf.

### **Preliminary Design Phase**

The following areas for efficiency improvement in the preliminary design stage of design-build projects were identified by the content analysis of multiple reports on environmental processes and the interviews with six state DOTs.

*Opportunity 1: By identifying alternate mitigation strategies, maximum impacts, and performance mitigation measures, state DOTs should provide more flexibility to the NEPA document and special studies.*

The NEPA document should have as its primary goal clearing the way for the project's construction rather than designing a solution to meet the needs and goals of the project. This creative idea frequently results in a win-win situation for the design-build team and the state DOT, as well as reduced project costs. State DOTs have discovered that they can boost design-build innovation by employing performance mitigation for NEPA obligations. Sound barriers are a popular type of performance-based mitigation used to reduce noise. Six state DOTs were interviewed and the content analysis of design-build RFPs brought to light the significance of adding more flexibility through the use of the following techniques. (1) Utilizing performance specifications to reduce noise; (2) Applying performance-based mitigation to other kinds of environmental impacts; and, (3) Use of broad description of impacts in NEPA.

*Opportunity 2: To expedite environmental planning and permitting procedures and provide for greater flexibility in the NEPA document, State Departments of Transportation could enter into programmatic agreements with federal and environmental agencies.*

Programmatic agreement with federal and environmental agencies can streamline the development of the NEPA document by providing pre-approved mitigation measures for various environmental impacts. Programmatic agreements allow for project level decisions to be governed by a larger agreement that expedites decision making and streamlines project level agreements(Parametrix,Inc. & Venner consulting, 2012).

### **Procurement Phase**

The design build project delivery system enables state DOTs to share responsibilities and risk with design build teams. Utilizing opportunities for risk allocation can result in better risk mitigation during construction of projects.

*Opportunity 1: State DOTs should obtain time-consuming and high-risk permits as soon as possible, letting the design-build team handle obtaining non-critical permits.*

State DOTs are increasingly opting to hand off environmental permit preparation and acquisition to design-build teams in design-build projects, particularly for permits that hinge on the design team's final proposal for a solution. The following environmental permitting techniques are commonly used by state departments of transportation (DOTs): Agency heads at seven DOTs Permits are obtained by the state Department of Transportation (DOT), and the design-build team is in charge of either complying with or modifying them; (2) the state DOT obtains certain early action high-risk permits, and the design-build team is in charge of complying with and modifying those permits; and (3) the design-build team is in charge of obtaining and complying with permits(Molneaar et al., 2008).

### **Post Award Phase**

Several risk allocation strategies can be used to transfer certain responsibilities such as environmental compliance and administration to design build team.

*First opportunity: state departments of transportation ought to mandate that the design-build team have an environmental management plan and an environment compliance manager in order to monitor the project's effects on the environment and guarantee permit compliance.*

As part of the design-build contract, state DOTs should mandate that the design-build team draft and implement environmental management or compliance plans. The protocol for

handling events and accidents to reduce their environmental impact is outlined in the environmental management plan. The state DOTs and/or the design-build team should have an environmental compliance manager on site at all times throughout construction, according to studies and state DOT practice, in order to manage environmental compliance appropriately.

In design-build projects, having a single point of accountability has several benefits that can improve project productivity by streamlining communication and making dispute resolution easier. **Streamlined Communication:** Information must be shared between the owner, the designer, and the contractor in traditional design-bid-build processes. Confusion and delays may result from misread or poorly delivered messages. The owner only has to deal with one point of contact when working with a design-build team. By doing this, communication bottlenecks are removed and project collaboration is guaranteed. **Quicker Resolution of Conflicts:** Construction projects are bound to encounter disagreements and unanticipated problems. If a disagreement emerges in a design-build project, the owner just needs to speak with the design-build team.

This gets rid of the finger-pointing that sometimes happens in typical projects, where contractors and designers could point the finger at one another for issues. Issues can be found and fixed more quickly when there is a single point of accountability, which minimises delays to the project timeline. **Increased Productivity in Projects:** Efficient communication and expedited dispute resolution are key components of more efficient projects. When there is open communication and rapid problem solving, the design-build team can work together to identify solutions and keep the project moving forward. Delays and rework are decreased as a result, which eventually speeds up the project's completion timeline (American society of civil Engineers, 2017).

One of the main benefits of design-build projects is that they have a clear line of accountability, which helps with project control. The following are some of the ways that a distinct chain of accountability improves project management: **Assignment of Responsibilities:** It is simple to assign particular tasks and deliverables when there is only one design-build team handling both design and construction. Within the design-build entity, each team member or sub team has distinct responsibilities and ownership over their own region. By doing this, confusion and finger-pointing are avoided, which are common in traditional projects where accountability may be shared by several people.

**Monitoring Progress:** It is much simpler to keep track of project progress when accountability is apparent. The performance of the design-build team can be tracked by the owner in relation to predetermined benchmarks and milestones. This makes it possible to spot any potential delays or plan deviations early on. **Finding Issues:** A clearly established chain of accountability makes it easier to identify the underlying cause of issues that crop up throughout a project. This minimises the effect on the project schedule and budget by enabling prompt, targeted corrective action(Turner construction company, 2014).

Design-build projects have a great deal of promise for better risk management since they encourage early contractor and designer engagement. **Early Risk Identification:** Compared to a standard design-bid-build situation, designers and contractors can discuss and identify potential risks far earlier when they collaborate from the beginning of a project. The building expertise of the contractor might be utilised to detect possible issues with materials, constructability, or site circumstances that the designer may not have independently anticipated. **Preventive Mitigation Techniques:** Early risk identification enables the design-build team to create preventative mitigation plans. This could entail altering the design, selecting different building materials or techniques, or including backup plans in case of unanticipated events. The group can lessen the effects of hazards by acting quickly(American council of Engineering companies(ACEC), 2017).

In design-build projects, early collaboration between contractors and designers is a potent tool for better risk control. **Combined skills:** A synergy of skills is created when designers and contractors collaborate early on. While builders provide real construction experience and awareness of constructability, materials, and potential obstacles on the ground, designers provide their knowledge of building codes, functionality, and aesthetics. The amalgamated information repository facilitates a more thorough identification of possible hazards.

**Proactive planning and foresight:** By cooperating from the start, the team can identify possible problems before they arise. The designer might suggest a stunning, elaborate facade, for example. Aware of the intricacy and potentially high expense of building, the contractor can provide substitute materials or techniques that have a comparable look but are less complicated and more affordable to construct(Walker,D.H. et al., n.d.).

### **2.2.2.2 Challenge Associated with DB Implementation**

Up until recently, ethical, legal, and licencing issues made it difficult for the public sector to accept design-build projects. The main objections to the idea stemmed from ethical worries that the ordinarily impartial opinion of experts in architecture and engineering would be influenced by the financial risk-taking that is usually associated with the "build" portion of the design-build process. Legal worries about the possible loss of checks and balances to safeguard priceless taxpayer funds drove secondary resistance. The public sector's ethical and legal challenges, however, are playing "back seat" to more potent advantages like efficient budget control and quick/high-quality building(Goldberg, 1999a).

In their study on "challenges and opportunities for expediting environmental analysis in transportation Design-build projects," David Hannon, Kia Mostaan, and Baabak Ashuri separated the difficulties associated with the design-build delivery system into four categories: those that arise during the concept, preliminary design, procurement, and post-award phases.

#### **Concept phase**

In the project concept phase, two critical challenges can affect the environmental planning and permitting process of design build project.

#### *First challenge: regulatory bodies' worries about a design-build project's incomplete design*

Regulatory agencies have limited staff to review and coordinate on the projects(Parametrix,Inc. & Venner consulting, 2012). This constraint is particularly noticeable in design-build projects, when extra cooperation and coordination would be needed to effectively handle and reduce project risks and suggested alternatives. Design-build projects usually entail an expedited delivery timetable and need a greater amount of staff time and resources from the regulatory body. Generally, regulatory agencies do not participate in project scope development processes other than those outlined in the National Environmental Policy Act (NEPA) (Washington State DOT(WSDOT), 2004). Regulatory agencies are typically supplied with a set of known project alternatives (also known as the project corridor) throughout the NEPA process. These organisations must offer their opinions on the corridor or the alternative. Agencies may need to discover more areas of possible environmental resources, which could put a burden on resources, in order to appropriately manage environmental risk and resources on design-build projects.

### *Challenge 2: Incorrect Resource Identification*

The first phase in environmental assessments and permit acquisition is determining the consequences on environmental resources. The capacity of the design-build team to effectively design and execute the project, as well as to manage the environmental risk associated with it, is compromised by improper resource identification. The project schedule may suffer from improper identification and insufficient linking of these parts with the project design elements.

### **Preliminary Design phase**

The main stage before contract advertising and hiring the design-build team is the preliminary design phase. The project design information is a major source of information used by permitting bodies to specify the mitigation requirements for specific environmental consequences(Washington State DOT(WSDOT), 2004).This traditional approach does not always suit design-build projects that involve incomplete design plans.

### *Challenge: NEPA's traditional prescriptiveness*

For more than 40 years, regulatory agencies have collaborated on design-bid-build projects using the NEPA process. In a standard design-bid-build project, the design parameters are incorporated into the NEPA document and related "Special studies" to precisely document the environmental effects of the project's design as it progresses. The criteria included in the NEPA document frequently limit the creative alternatives available to design construct teams or need a NEPA revaluation(Wood,H.P Kassoff,H, 2011). The extensive NEPA procedure is predicated on assessing options and distributing the environmental effects among them in relation to resources. The length of time needed for the NEPA planning process is increased by the absence of guidelines, uneven requirements and variations, and strict interpretations in policy and regulations(Parametrix,Inc. & Venner consulting, 2012).

### **Procurement Phase**

The procurement method, which delineates how an owner selects a design build team for a project, has a significant impact on the outcome of the project.

### *Challenge: Give in to agency worries regarding design-build teams' pressure.*

For most projects, resource agencies will look into permitting for the worst-case scenario as a possible option. Even in cases where the environmental impacts are lessened, these bodies frequently favour maintaining the same level of mitigation. Agencies are concerned that if the

design-build teams' suggested design lessens impacts, they will try to lower the permissible mitigation requirements. Instead of granting permits for fictitious scenarios where there is no guarantee that the design-build team will adhere to contract requirements, agencies prefer to grant permits for real impacts(Louis Berger Group,Inc., 2007).

### **Agency leaders at seven state department of transportation (DOTs)**

#### **Post-Award Phase**

Even in cases where the state DOT passed all regulatory risk to the design-build team, the agency officials at the seven state departments of transportation (DOTs) and the design-build team are nonetheless vulnerable to environmental effects. The design-build team, acting as the project sponsor or permittee, may hold state DOTs accountable for noncompliance; environmental impacts usually result in fines and in some cases lawsuits.

*The first challenge is re-evaluating the National Environmental Policy Act (NEPA) document due to suggested design modifications.*

A revaluation of the NEPA document is necessary for any proposed change to the document, according to a fast assumption made by many state DOTs and division FHWA offices. Although this can be prevented by giving the NEPA document more flexibility, as was mentioned in the opportunities for the preliminary design phase, no amount of flexibility can completely remove the requirement for the NEPA document to be re-evaluated for some projects. On design-build projects, when the NEPA document is frequently completed based on plans that are just 30% complete, changes are particularly frequent. Re-evaluations can take a lot of time to finish and provide a risk that is challenging for a design-built team to handle if they occur after a contract has been awarded.

*Re-evaluating the National Environmental Policy Act (NEPA) document in light of proposed design alterations presents the first challenge.*

State DOTs should determine early in the development of a project which party is best suited to prepare and obtain required environmental permits. Permits obtained in advance of advertising the RFP for a design-build project are typically procured with plans that are 30 percent complete. While this level of design is preferable to design build teams to allow them maximum flexibility in the final design of the project, regulatory agencies prefer to issue permits based on actual impacts and a higher level of design completion. State DOTs must balance the design advancement to provide enough information, while not limiting innovation.

One of the biggest obstacles to construction projects is poor coordination and communication between designers and contractors, which can have a cascading effect of issues. Misunderstandings are common when designers and contractors fail to explain project information clearly. Confusion about requirements, unclear blueprints, or overlooked revisions can cause building errors. Rework and Postponements: These errors invariably result in rework, which involves demolishing and repairing previously constructed work. This causes delays in the project schedule by adding a large amount of time. Waiting for fresh designs or clarification can potentially cause delays if communication routes are imprecise or slow. Cost Overruns: Rework and delays come at a high cost. While waiting, construction workers are idle, and materials might have to be destroyed or reordered. Additionally, if changes need to be made mid-construction due to communication gaps, costs can surge(Shahid et al., 2015)..

While there are many advantages to single-source responsibility in design-build, it can also conceal cost difficulties during the design stage, which might cause challenges down the road. This is the reason why: Misalignment of incentives: Creating the best design is the designer's only concern in a standard design-bid-build project; construction costs are not a concern. In contrast, the contractor bases his or her bid on the completed blueprints. Because the contractor isn't involved in the design and can spot possible cost blowouts before construction starts, this separation helps to control costs. Early Cost Estimates Could Be Off: The design team in a design-build project is also in charge of project cost estimation. Their early estimates may be off because they aren't only focused on building, particularly on intricate projects. This could give designers a false sense of security while they're designing. Pressure to Maintain Budget Appearance: The design-build team may feel pressured to minimise projected cost increases in the design phase in order to keep the project moving forward, as they are in charge of both the budget and design. This may cause unanticipated costs to come up later on in the building process(Molenar,K.R. & Soger,A.W., 2012).

Uneven negotiating strength between the design-build contractor and the owner might present significant difficulties. when carrying out the project: Market Dynamics: Generally speaking, design-build teams—especially smaller ones—lack the resources and project experience that public or private owners do. This makes it so that the owner can choose the conditions of the contract, creating an unfair playing field. Standardised Contracts: Owners may employ pre-drafted, lopsided agreements that greatly benefit them. These agreements frequently shift an excessive amount of risk, such as cost overruns brought on by unforeseen site circumstances

or ambiguous project specifications, to the design-build contractor. In a competitive setting, design-build teams may make incredibly low bids in an attempt to win the contract, a tactic known as "cutthroat pricing." This may cause them to economise on labour or materials when building, which could lower quality and possibly result in safety risks. Decreased Innovation: Contractors are less likely to suggest novel materials or solutions when they bear the majority of the risk under the contract. Even when there are better solutions, they could persist with tried-and-true techniques just to save money in case something goes wrong. Disputes and Claims: In the event that unanticipated problems occur while building and the contract unjustly transfers risk to the contractor, the contractor is more likely to sue the owner to recover damages. Delays in project completion and expensive legal fights may result from this(American bar association, 2019).

Additionally, it highlights how important pre-project planning and transparent communication are to ensuring that clients are prepared to make decisions at the appropriate moment during the design development phase(Mostaan et al., n.d.). Another study's findings indicate that one drawback of the design-build delivery approach is the requirement for quick decision-making and client involvement (Federal highway administration, 2013).

### **2.3 Empirical Review**

Diverse studies have been conducted regarding the effectiveness of the design-build delivery approach. This part discusses the empirical review of a few research that are relevant to the goal of this investigation.

Hadi Abou Chacra and Amina Ashi (2019) conducted a comparative analysis of the design-build and design-bid-build project delivery systems in Lebanon. In order to determine the similarities between Lebanon and these nations, the study's two main goals were to first evaluate and compare the performance of design-bid-build and design-build projects in Lebanon and then compare the outcome with the performance of comparable systems in the USA and the Far East. The performance of 102 residential building and tower projects completed in Lebanon was assessed using seven performance indicators that were determined based on the following factors: cost, time, quality, communication, risk, and safety. The study's findings unequivocally demonstrate that Lebanese DBB projects operate more efficiently in terms of timeliness, frequent work activity inspections, and safety. On the other hand, database initiatives perform better in terms of risk, communication, cost, and appropriate material and equipment storage. The study's conclusions are significant in that they offer Lebanese business owners' useful guidance when selecting the best project delivery method. The authors advised

clients to use DB delivery systems if they wanted to build projects with less cost growth. Under this arrangement, the contractor and the owners agree on a fixed fee as well as any additional expenses. Additionally, as the contractor bears the majority of the risks in this system, it is advised that owners choose the DB delivery system when building projects that may involve several dangers. Conversely, Albert P.C. Chan, David Scott, and Edmond W.M. Lam's study on the framework of success criteria for design-build projects aims to establish project success criteria for a design-build project in the construction industry. This is achieved by first identifying pertinent project success measures for a construction project from previous studies, with a focus on design-build projects, and then by developing a thorough framework for project success assessment for design-build projects.

According to this report, the design-build procurement technique is being used more frequently as practitioners become more aware of its advantages. To evaluate the project success of design build projects, a new assessment framework that incorporates the success criteria of a construction project in general is required. This paper presents such a framework and evaluates a design-build project at the preconstruction, construction, and post construction stages. At different stages, several sets of criteria are taken into account. Furthermore, measuring the success of a design-build project may involve not just the project but also its collaborators, end users, and even external parties.

## **CHAPTER 3: RESEARCH METHODOLOGY**

The research methodology that was employed to gather and examine the study's data is covered in this chapter. In order to achieve the study goal, it explains the population, sample size, sampling methodologies, instruments for data collecting, processes, and data analysis method.

### **3.1 Research design**

A research design is a set of procedures that a researcher uses to provide credible, unbiased, and cost-effective answers to questions (Bello & Uyoyo, 2018). Another way to put it would be as a thorough blueprint for how the study is to be done. This study's research design is of the descriptive kind. The goal of descriptive research is to precisely and methodically characterize the population, circumstance, or phenomena under study. Another way to put it would be as a thorough blueprint for how the study is to be done. Descriptive research is appropriate for explaining things as they naturally occur since it aims to determine, describe, and focus on answering the "who," "what," "when," and "how" questions (McCombes, S., 2019). As a result, the study aids in understanding and determining the opportunity and challenge of the design-build delivery system for the Abay new headquarters building project.

### **3.2 Research Approach**

There are three types of research approaches: qualitative, quantitative and mixed methods (Mbhiza, H.W., 2017). In qualitative research, non-numerical data must be collected and analysed in order to understand concepts, viewpoints, or attitudes. It can also be utilised to compile comprehensive data regarding an issue. A method for testing objective theories by looking at the relationship between variables is called quantitative research. Quantitative techniques focused on objective metrics and statistical, mathematical, or numerical interpretation of data from closed-ended questionnaires (Saunders, M., Lewis, P. and Thornhill, A., 2009). This study will use a mixed research design with a sample size of 21.

### 3.3 Description of study variable

The independent variable in this study was design build delivery system and Project completion time, project cost, project quality, and collaboration and communication were the dependent variables in this study.

### 3.4 Description of study area and target population

Staff members who work as consultants, contractors, or client representatives at various levels are the study's target audience. project managers, coordinators, project engineers, Resident engineers, and design teams is taken into account. Since project performers actively participate in and contribute to project activities, they were selected as the target population.

The below table shows target population for the study.

Table 3. 1 Target population

No.		Target population	Population size
1	Client Side		
		Project Manager	1
		Resident Engineer	1
		Project Coordinator	1
		Project Engineer	3
2	Consultant		
		Project Manager	1
		Resident Engineer	1
		Assistance Residence Engineer	1
		Design review team members	6
3	Contractor		
		Project manager	1
		Coordinator	1
		Design Engineer	4
<b>Total</b>			<b>21</b>

### **3.5 Sampling techniques/method and sample size**

For the Abay Bank new head office building project, the population size (N) was 21. The census technique has been used to sample the total population since N is less than 200. A census technique is characterized as a comprehensive list of every object in the population. Therefore, all 21 employees that took part in the project to create the new headquarters building make up the study's sample size. One advantage of using a census technique is that it allows information to be obtained from every member of the project's population.

### **3.6 Data collection**

Primary and secondary data sources was employed in this investigation. While the secondary data sources included the contract document, project progress report, technical report, related research papers, journals, literature, articles, and websites, the primary data sources were obtained directly from Abay New Headquarter project participants through questionnaires and interviews. Both Open-ended and closed-ended questions were included in the questionnaire to get respondents' opinions about the prospects and challenges of the design-build delivery system for the new Abay headquarters building. The questionnaire was adapted to fit the research topic by drawing on prior, comparable studies. Following amendment, respondents was received the questionnaires.

### **3.7 Data Analysis**

The research subjects in this study were addressed through the use of qualitative data analysis approaches. Extensive investigation of experiences, perspectives, and motives is the main goal of qualitative research. The gathered data was examined by first organising the data, looking for reoccurring themes, first coding, creating a coding system, using the code scheme, and then analysing and interpreting the results. The study was descriptive in nature, and the respondent's response was rated and displayed using graphs and charts.

### **3.8 Reliability and validity analysis**

The two most fundamental and important factors in assessing any measurement tool for quality research are validity and reliability. Validity makes clear how effectively the information gathered pertains to the real topic of study(Ghauri,P. & Gronhaug,K., 2005).

With the use of SPSS V.26 software, the reliability of the questionnaire items in this study was be examined. The reliability test in SPSS will be performed to determine the internal consistency that can be attained by calculating the Cronbach's alpha value.

Table 3. 2 Reliability Result

No.	Variables	Cronbach's Alpha
01	Design build delivery system	0.733
02	Project Completion Time	0.812
03	Project Cost	0.833
04	Project Quality	0.710
05	Communication and Coordination	0.798

### **3.9 Ethical Consideration**

Ethical concerns should be addressed both during and after the research process in all types of studies. The ethical issues surrounding the collection, usage, and response to data analysis were considered in this study. The aim of the study and the potential results was explained to the participants before they begin. Generally speaking, the volunteers have all the information they need to make an informed decision about taking part in the study.

## **CHAPTER 4: DATA ANALYSIS AND DISCUSSION OF RESULT**

### **4.1 Introduction**

As stated in the preceding chapter, the goal of this research is to evaluate the opportunity and challenge of the design-build delivery system in the Abay headquarters building project. The study's findings are analysed and discussed in this chapter. The usage of Excel helped with the analysis. The questionnaire was created using open-ended, Likert-type scales, with 1 denoting extremely low, 2 low, 3 medium, 4 moderate, and 5 very high. The respondents' ratings for each aspect were recorded, and the frequency of the responses from the questionnaires was counted in order to analyse the results. After the data from the open-ended questions were collected, the answers were arranged, themes were searched for, a coding system was developed, the code scheme was used, and the findings were analysed and interpreted.

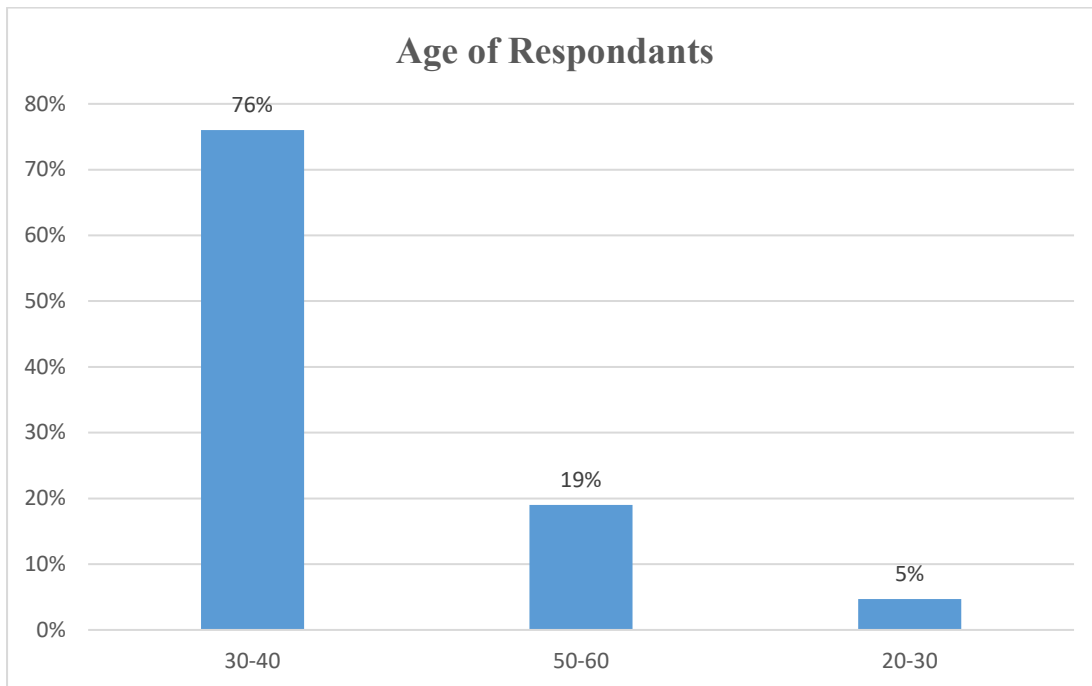
The following is a summary of the results and interpretation of the data obtained:

### **4.2 Response rate**

A questionnaire was employed as the main data gathering technique in the study. Twenty-one respondents who are presently working on the Abay headquarters construction project were the focus of the investigation. As a result, 21 respondents received questionnaires. Out of the 21 given questionnaires, 100% were completed and returned. In order to ensure that every questionnaire was completed, they were delivered during a significant meeting in which every respondent was present. According to (Mugenda, O.M & Mugenda A.G, 2003) response rate above 70% is considered very good for analysis

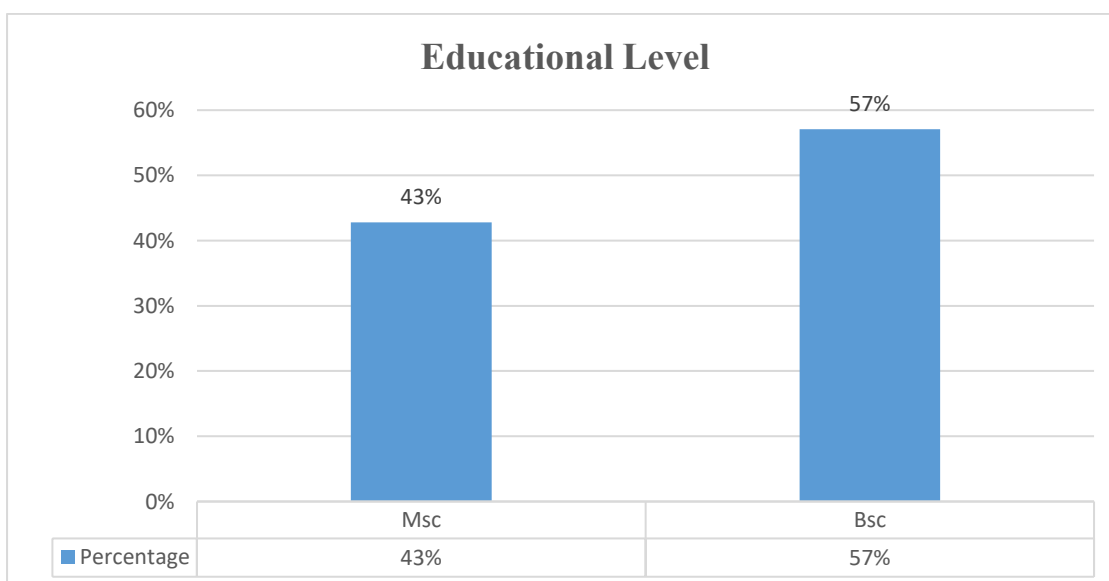
According to the survey results, 14 out of the 21 respondents (or67%) were men, and 7 respondents (or33%) were women. The majority of respondents were male. which suggests that the contribution of women to the construction of the Abay headquarters is minimal. The respondents' age distribution showed that 16 (76%) were in the 30- to 40-year-old age range, 19 (19%) were in the 50-60-year-old age range, and 1 respondent (5%) was in the 20-30-year-old age range. Based on these findings, it may be inferred that the respondents had the requisite expertise and knowledge to understand design-build projects. Figure 4.1 displays the findings and the ages.

Figure 4. 1 Age of the respondents



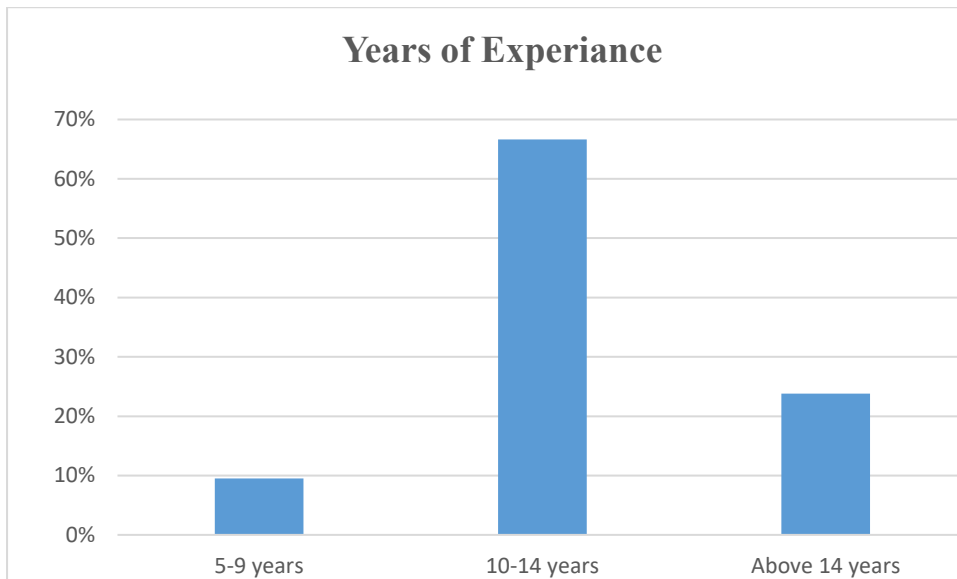
In terms of the respondents' educational background, 12 (76%) had a first degree, while the remaining 9 (19%) had a master's degree. This shows that the greatest level of education held by all research participants was a university degree, indicating that they were well-equipped to assess the opportunities and difficulties associated with the design-build delivery method used on the Abay headquarters building project.

Figure 4. 2 Education level of respondents



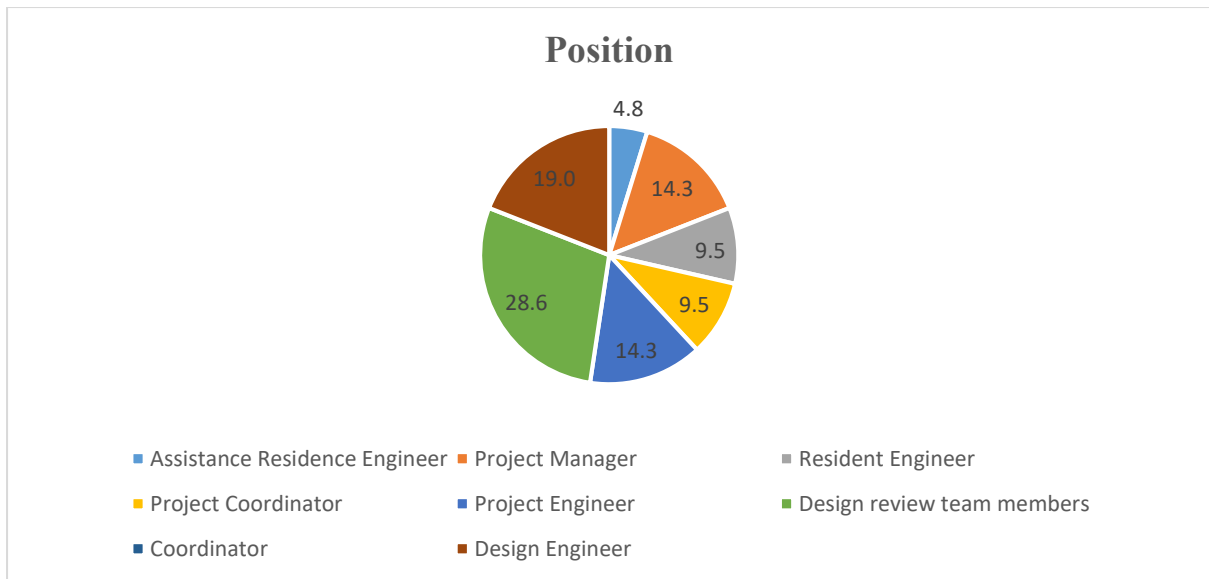
Two respondents (10%) had five to nine years' experience, 14 out of 21 respondents (67%) had ten to fourteen years' experience, and 5 respondents (24%) had more than fourteen years' experience, according to the study's findings. As a result, every respondent had more than five years of construction experience and was well-versed in the opportunities and difficulties associated with the design-build delivery method used on the headquarters building project.

Figure 4. 3 Respondents Work Experience



The responders held various responsibilities within the project to develop Abay's new headquarters. Three project managers (14.3%), two resident engineers (9.5%), one assistance resident engineer (4.8%), two project coordinators (9.5%), three project engineers (14.3%), six members of the design review team (28.6%), and the remaining respondents—four (19%)—were design engineers who were working on the project. This suggests that nearly every respondent was in a position to adequately address the potential and challenges associated with the design-build delivery system. Figure 4.4 illustrates how respondents were selected from a variety of positions in which they are employed.

Figure 4. 4 Respondents Position



### 4.3 Questions related to challenges of using Design build delivery system

The first portion of the questionnaire was meant to collect general knowledge about the design-build delivery system. This section consists of ten questions designed to determine the respondent's awareness of and thoughts on the challenges related to the Abay new head office building project. Regarding the design-build delivery system project, respondents were asked to rank their degree of agreement with the following statement: 1 represented extremely low, 2 represented low, 3 represented medium, 4 represented moderate, and 5 represented very high.

According to the responders, there is a low effect for communication and coordination concerns between the design and construction teams, a medium effect for two, a high effect for eleven, and a very high effect for six. One respondent stated that cost overruns are due to unanticipated delays or There was one very low challenge, three medium responders, twelve high effect respondents, and five very high respondent respondents. Regarding the difficulties encountered while allocating risks between the design-build company and the client, 10 respondents indicated that these challenges are medium-occurring, 7 indicated that they are highly occurring, and 4 indicated that they are really highly occurring. Regarding the last topic, Client Quicker Decisions, 1 respondent indicated that this is a low occurred challenge, 9 indicated that it is a medium occurred challenge, 9 indicated that it is a highly occurred problem, and 2 indicated that it is a very high occurred challenge.

Table 4. 1 Outcome of Design build delivery system challenges

Questions	Total Number of respondents	Frequency distribution	Total Result (%)
1. What were the biggest challenges encountered during the DB project delivery for the Abay Bank Headquarter building?			
Communication and coordination issues between design and construction teams	21	low=2 medium=4 high=8 very high=7	9 19 38 33
Difficulties in managing changes to the project scope	21	very low=1 low=9 medium=7 high=3 very high=1	5 43 33 14 5
Unforeseen delays or cost overruns	21	very low=1 medium=4 high=11 very high=5	5 19 52 24
Challenges in risk allocation between the design-build entity and the client	21	medium=10 high=7 very high=4	48 33 19
Limiting Competition	21	very low=12 low=4 medium=5	57 19 24

High Tendering Costs	21	low=3 medium=12 high=6	14 57 29
New Method & Unfamiliar with Process	21	very low=7 low=9 medium=5	33 43 24
Client Needs to Make Quicker Decisions	21	low=1 medium=9 high=9 very high=2	5 43 43 9
Clients Bringing pre-defined Design Requirements which can limit the design-builder ability to explore (Reduces the Innovation)	21	very low=5 low=8 medium=6 high=2	24 38 29 9
Other (Please specify)			

Now, we can use a relative important index to rank the encountered challenges of design build delivery system.

$$\text{Relative important index} = \frac{5N_5 + 4N_4 + 3N_3 + 2N_2 + 1N_1}{A * N}$$

N<sub>5</sub>=number of respondents for very low

N<sub>4</sub>= number of respondents for low

N<sub>3</sub>= number of respondents for Medium

N<sub>2</sub>= number of respondents for high

N<sub>1</sub>= number of respondents for very high

A (highest weight) N (Total number of respondents)

<b>Challenges</b>	<b>Relative important index</b>	<b>Important rank</b>
Communication and coordination issues between design and construction teams	0.79	1
Difficulties in managing changes to the project scope	0.54	6
Unforeseen delays or cost overruns	0.78	2
Challenges in risk allocation between the design-build entity and the client	0.74	3
Limiting Competition	0.33	8
High Tendering Costs	0.62	5
New Method & Unfamiliar with Process	0.32	9
Client Needs to Make Quicker Decisions	0.71	4
Clients Bringing pre-defined Design Requirements which can limit the design-builder ability to explore (Reduces the Innovation)	0.44	7

Using a design-build delivery strategy presents a number of difficulties. Based on the results, the majority of participants concurred that the primary obstacle to implementing a design-build project at the Abay headquarters building is a communication and coordination problem. Effective communication and coordination are essential to any design-build project's success. Multiple teams—the designer, the contractor, and the subcontractors—with varying agendas and communication styles are involved in the design-build process. Decision-making delays, misinterpretations, and incomplete information may result from this. It can be unclear who is responsible for what when roles and duties between the design and construction teams are not clearly defined.

This can impede problem-solving and lead to finger-pointing. Owners may occasionally feel excluded from the design-build team's progress throughout the design phase. This may lead to a finished product that falls short of their requirements or expectations.

Unexpected delays or cost overruns rank as the second most frequently reported drawbacks of adopting a design-build delivery strategy. The advantages of a simplified design-build process do not eliminate the possibility of unanticipated delays and cost overruns. Although design-build projects offer flexibility, significant design modifications made in the middle of a project can cause delays and disturbances to the construction schedule, even if the owner requests them. Conflicts over the scope and cost of changes stemming from a poorly specified change order process can cause cost overruns and delays in projects. Inadequate communication or ambiguous agreements may give rise to disagreements and litigation between the design-build team and the owner, incurring further expenses for legal counsel and settlement.

Difficulties in risk allocation between the design-build organization and the client were cited by the third most responders as a challenge of adopting the design-build delivery method. Design-build combines design and construction under one roof, as opposed to typical design-bid-build, which separates the two. This change begs the question of who is responsible for any mistakes or omissions in the design that affect construction? Design-build agreements frequently have a set cost that is determined by the first plans. Unexpected complications resulting from insufficient design elements may give rise to conflicts about who bears the additional cost of fixing them during construction.

One area of disagreement may be the owner and design-builder's respective risk allocation balances. When it comes to unforeseeable occurrences outside their control, contractors advocate for better risk sharing, whereas owners frequently want the design-builder to accept most risks for a predetermined price.

The fourth most common problem cited by respondents when utilizing a design-build delivery system is the requirement for clients to make decisions more quickly. In a design-build delivery system, the client's requirement for speedier decision-making is essential for various reasons. Clients frequently have strict timelines for finishing their projects. Making decisions about design elements, materials, and change orders more quickly can assist prevent delays and keep the project moving forward. Clients frequently have strict timelines for finishing their projects. Making decisions about design elements, materials, and change orders more quickly can assist prevent delays and keep the project moving forward. Clear communication and cooperation between the client and the design-build team are frequently necessary for faster decision-making.

This encourages a project atmosphere that is more proactive and effective. Making choices quickly about risks that have been recognized helps to implement backup plans, which helps to minimize potential disruptions and lowers project risk overall.

The potential of the design-build delivery system has been clarified by the quantitative study. We now move to the qualitative data to examine the subtleties and "how" and "why" of these conclusions.

What were the main obstacles faced during the DB project delivery for the Abay Bank Headquarter building, the interview question posed to the respondents? The following themes are comprised on the respondents' responses.

#### **4.3.1 Theme 1: Challenges encountered during the DB project delivery**

Adopting a design-build delivery approach presents unique difficulties. An interview with prepared questions was conducted to gauge the difficulties encountered in delivering the DB project, and the participants responded. The following themes are comprised on the respondents' responses.

##### ***4.3.1.1 Sub-theme 1: Communication and coordination issue***

The majority of those surveyed mentioned that one of the biggest difficulties they had in implementing the design-build project for the Abay Bank's new headquarters building was coordination. "Coordination and communication issues are the main encountered challenge in our project," said one respondent. The results of the qualitative research further indicate that the primary obstacle facing the design and construction of the Abay Bank new headquarters building is a communication and coordination problem.

##### ***4.3.1.2 Sub-theme 2: unexpected cost overruns***

The majority of respondent's state that the biggest obstacle to implementing the design-build delivery method at the Abay Bank new headquarters building was unforeseen cost overruns.

##### ***4.3.1.3 Sub-theme 3: requirement for clients to make quick decision***

One of the challenges encountered, according to the respondents, is the need for clients to make decisions quickly. "Client not providing quick decision is the main challenge in this project," said one respondent.

How well were these obstacles resolved during the project? is the second open-ended question in the interview concerning the difficulties faced during the DB project delivery for the Abay

Bank Headquarter building. The responses from the respondents are divided into the following themes.

#### **4.3.2 Theme 2: Strategies used to mitigate the encountered challenges**

Using a design-build delivery strategy presents a number of difficulties. A range of difficulties with the design-build delivery system for the Abay Bank head office building project were noted by survey respondents. The following subthemes were used to group the difficulties.

##### ***4.3.2.1 Sub-theme 1: Early and effective communication***

Recognizing the importance of clear and timely communication, the panellists emphasized its role in mitigating project issues. They highlighted the value of bringing up difficulties with both employers and consultants as a means to expedite project progress. One panellist stated, "Challenge is a tool for learning if we get any challenges during the project addressed to consultant and employer to solve the problems and speed up the project." Similarly, others echoed the importance of keeping all stakeholders informed, suggesting communication through meetings with contractors, clients, and consultants. Even escalation to the client's top management for approval was mentioned as a strategy for addressing challenges.

##### ***4.3.2.2 Sub-theme 2: Risk allocation in the contract***

The majority of respondents indicated that the project's risk allocation strategy, outlined within the contract, was successful in handling obstacles. This approach, as highlighted by the responses, emphasizes the importance of identifying potential risks beforehand and assigning clear responsibility for their mitigation amongst all stakeholders. By clearly defining roles, responsibilities, and risk allocation within the contract, the project team was better equipped to address unforeseen challenges.

##### ***4.3.2.3 Sub-theme 3: Quick Decision making***

Despite encountering delays within the client's decision-making process, the majority of respondents acknowledged the client's efforts to expedite approvals within the project office. They also highlighted the client's approach of escalating critical issues requiring management

intervention to the bank's top management. This proactive strategy, according to the respondents, played a significant role in mitigating project challenges. The following section details the grouped themes identified from the third open-ended question, where respondents provided recommendations for minimizing such issues in future database initiatives.

### **4.3.3 Theme 3: Strategies to mitigate the challenges in future DB project**

#### ***4.3.3.1 Sub-Theme 1: Early and continuous communication protocols***

Effective communication channels amongst all stakeholders emerged as a key recommendation from the majority of respondents to minimize project difficulties. This includes establishing clear and consistent communication practices, as highlighted in responses like "communicating daily basis with all stakeholders" and "communicating the consultant and the client quickly when a challenge is encountered that can affect the progress of the project." Furthermore, respondents emphasized the importance of a well-defined and comprehensive contract document.

#### ***4.3.3.2 Sub-theme 2: Refined project requirement and scoping***

In addition to effective communication channels and a well-defined contract, respondents offered several recommendations to further reduce project difficulties. These include: clearly outlining the project scope in more detail during the tendering process, ensuring the employer's requirements are precise and comprehensive within the Design-Build contractor agreement, and careful negotiation and implementation of the contract. Furthermore, respondents emphasized the importance for the Design-Build contractor to have a clear and achievable work program with look-ahead plans and readily available skilled staff on site. Successful project execution was also linked to strong design coordination, respecting established work methodologies, and strict implementation of quality assurance and quality control procedures. Finally, the role of the engineer and employer in upholding their responsibilities as defined by the contract was highlighted.

#### ***4.3.3.3 Sub-Theme 3: Enhanced design build team selection***

As a third key recommendation to minimize project difficulties, respondents emphasized the importance of staffing the project with skilled personnel across all stakeholder groups. This

aligns with responses like "Making sure that the contractor and the consultant have all the required professionals since the project is complex" and "The contractor should have all professionals to manage the project." By deploying qualified and competent workers, the project is better equipped for success, ensuring clients and engineers can effectively fulfil their respective roles and obligations.

#### 4.4 Questions related to Opportunity of using Design build delivery system

Thirteen questions make up this section, which aims to gauge the respondent's understanding of and reflection on the difficulties encountered with the Abay new head office building project. Respondents were asked to rate their level of agreement with the following statement regarding the design-build delivery system project: 1 for very low, 2 for low, 3 for medium, 4 for moderate, and 5 for very high. The results are displayed in the table below.

According to the results of the census, six respondents said that responsibility is an opportunity that occurs at a medium level, eleven respondents said it occurs highly, and four respondents said it occurs very highly. In reference to reduced administration, one respondent indicates that it is a very low occurred opportunity, five indicate a medium occurred opportunity, twelve indicate a high occurred opportunity, and three indicate a very high occurred opportunity. When it comes to better risk management, one respondent said it happened very infrequently, three said it happened low, eight said it happened medium, and nine said it happened frequently. The final group of respondents said that there was a low degree of opportunity for single-source responsibility, a medium level for six, a high level for six, and a very high level for five.

Table 4. 2 Outcome of Design build delivery system Opportunity

Questions	Total Number of respondents	Frequency	Total Result (%)
2. In your opinion, what were the significant opportunities or benefits observed due to the DB project delivery system in this project?			

Improved project efficiency and faster completion time	21	very low=4 low=6 medium=6 high=5	19 28 28 24
Enhanced collaboration and innovation between design and construction teams	21	low=10 medium=4 high=7	48 19 33
Greater cost certainty and potential for cost savings	21	very low=2 low=6 medium=7 high=4 very high=2	9 28 33 19 9
Streamlined decision-making process	21	very low=9 low=6 medium=4 high=2	43 28 19 9
Reduced Administration	21	very low=1 medium=5 high=12 very high=3	5 24 57 14
Single-Source Responsibility	21	low=4 medium=6 high=6 very high=5	19 28 28 24
Quality Equal or Better Than D-B-B	21	low=6 medium=10 high=5	28 48 24

Innovation	21	low=5 medium=9 high=7	24 43 33
Cost Savings	21	very low=2 low=4 medium=8 high=7	9 19 38 33
Projects Completed Faster	21	low=5 medium=7 high=9	24 33 43
Improved Risk Management	21	very low=1 low=3 medium=8 high=9	5 14 38 43
Early Knowledge of Total Costs	21	very low=2 low=2 medium=8 high=9	9 9 38 43
Accountability	21	medium=6 high=11 very high=4	28 52 19
Other (Please specify)			

Now, we can use a relative important index to rank the opportunity of design build delivery system.

$$\text{Relative important index} = \frac{5N_5 + 4N_4 + 3N_3 + 2N_2 + 1N_1}{A * N}$$

N5=number of respondents for very low

N4= number of respondents for low

N3= number of respondents for Medium

N2= number of respondents for high

N1= number of respondents for very high

A(highest weight) N(Total number of respondents)

<b>Opportunity</b>	<b>Relative important index</b>	<b>Important rank</b>
Improved project efficiency and faster completion time	0.51	10
Enhanced collaboration and innovation between design and construction teams	0.57	9
Greater cost certainty and potential for cost savings	0.58	8
Streamlined decision-making process	0.39	11
Reduced Administration	0.75	2
Single-Source Responsibility	0.71	3
Quality Equal or Better Than D-B-B	0.59	7
Innovation	0.61	6
Cost Savings	0.59	7
Projects Completed Faster	0.63	4
Improved Risk Management	0.63	4
Early Knowledge of Total Costs	0.62	5
Accountability	0.78	1

According to the results, the majority of respondents felt that a clear line of accountability is the first advantage of adopting a design-build project in the Abay head office building, as the design-builder is in charge of making sure the project satisfies all requirements. When a project is designed-build, the contractor is in charge of both the building and the design. According to the second most responses, one benefit of implementing a design-build delivery system on the Abay Bank head office building project is decreased administration. The design and construction phases are covered under distinct contracts in typical design-bid-build procedures.

This means overseeing many contracts, liaising with two distinct parties (the general contractor and the architect/designer), and possibly having to deal with misunderstandings and finger-pointing between the two. One contract with the design-builder company makes the process simpler with design-build. This simplifies the procedure in its entirety by: Doing away with the requirement to oversee several contracts. lowering the amount of cooperation required between various construction and design teams. The respondents believe that using a design-build delivery method offers the benefits of better risk management and single-source accountability.

The potential of the design-build delivery system has been clarified by the quantitative study. We now move to the qualitative data to examine the subtleties and "how" and "why" of these conclusions.

"In your opinion, what were the significant opportunities or benefits observed due to the DB project delivery system in this project?" was the interview question posed to the respondents. The following themes are comprised on the respondents' responses.

#### **4.4.1 Theme 4: Opportunity of Design build delivery system**

Using a design-build delivery method offers various advantages. The participants in an interview with prepared questions answered in order to assess the opportunities faced in completing the DB project. Based on the responses of the respondents, the following themes are included.

##### ***4.4.1.1 Sub-Theme 1: clear line of accountability***

A clear chain of accountability is cited by the majority of respondents as the primary benefit of using a design-build delivery system for the Abay Bank head office project. The majority of

respondents believe that having a clear chain of accountability between all stakeholders is facilitated by the design-build delivery system.

#### ***4.4.1.2 Sub-Theme 2: Better risk management***

The majority of respondent's state that the primary benefit of using a design-build delivery system is improved risk management. According to one reply, "the risk is reduced at design build delivery system, where collaboration of design team and other staffs at the design phase is possible."

### **4.4.2 Theme 5: Strategies to Leverage the potential benefit of Design build delivery system**

The majority of respondents indicated that pre-project preparation and team selection is the recommended approach to maximize the potential benefits of DB in this project. The following subthemes represent the tactics used to maximize the potential benefits of design-build projects.

#### ***4.4.2.1 Sub-Theme 1: Refined project requirement and scoping***

To maximize the potential benefits of design-build projects, the majority of respondents advocated for two key strategies: improved communication among stakeholders and a well-defined project scope within the contract agreement. This is reflected in responses like "Just make the scope of work and specifications with more detail during tendering process" and "Making the scope of the project in a clear and well-defined manner." An opposing viewpoint emerged from one respondent who suggested using the existing contract as a foundation but pressuring the contractor to exceed the minimum requirements and deliver superior work, ultimately maximizing the potential benefits of the design-build approach.

#### ***4.4.2.2 Sub-Theme 2: Enhanced design build team selection***

When it comes to maximizing the potential benefits of a design-build database project, a key strategy revolves around building a team with expertise across all stakeholder groups. This differs from the traditional design-bid-build approach where design and construction are separate entities. In design-build, a single Design-Build (DB) contractor is responsible for both aspects. This contractor assembles a team of internal experts or hires external specialists to complete the project. Early collaboration between these design and construction experts fosters improved communication and early problem identification. This teamwork streamlines the design and build process. Furthermore, by working with certified experts, the DB contractor brings a wealth of knowledge and experience to the project, as highlighted in responses like

"Making sure the contractor, consultant and client team should be equipped with professionals." One participant suggested that including key stakeholders, such as end-users and facilities management, during the initial design stages can further enhance the potential advantages of a design-build contract.

#### **4.4 Qualitative Analysis**

The qualitative analysis focused on understanding the challenges and opportunities associated with using a design-build (DB) delivery approach for the Abay Bank headquarters building project. Here's a breakdown of the key results and themes identified:

The qualitative analysis identified several challenges associated with the design-build delivery method for the Abay Bank project. The most frequent issue was communication and coordination problems between designers, contractors, and the client. This suggests difficulties in information flow and collaboration throughout the project. Another challenge was unexpected cost overruns, highlighting the need for improved cost estimation and risk management during the planning phase. Finally, delays in client-side decision-making were also seen as a hurdle that impeded project progress.

The analysis also explored strategies to mitigate these challenges. The importance of establishing clear communication protocols and fostering open communication among all stakeholders, including designers, contractors, and the client, was emphasized. This could involve regular meetings and clearly defined channels for information flow. Another key strategy involved a well-defined contract with clear risk allocation. By outlining responsibilities for handling unforeseen issues upfront, the project team could be better equipped to manage them. Interestingly, the client's efforts to expedite approvals and escalate critical issues were highlighted as positive steps towards addressing challenges related to slow decision-making.

Looking towards future projects, the analysis suggests several strategies to prevent these challenges. First, establishing clear and consistent communication protocols throughout the entire project lifecycle was seen as essential. This could involve regular meetings, designated communication channels, and ensuring all parties are kept informed. Second, the importance of clearly defining the project scope and ensuring the client's requirements are meticulously documented in the contract was highlighted. This reduces ambiguity and minimizes the

potential for misunderstandings that can lead to problems. Finally, selecting a design-build team with skilled personnel across all stakeholder groups – contractor, consultant, and client – was viewed as crucial for project success. A well-rounded team with expertise in each area fosters better collaboration and problem-solving throughout the project.

The analysis also identified some opportunities associated with the design-build delivery system. One key advantage was the clear chain of accountability it establishes for project outcomes. With a single entity responsible for both design and construction, there's less finger-pointing and a more streamlined process for resolving issues. Additionally, the design-build approach fosters collaboration during the design phase. This allows for earlier identification and mitigation of potential risks, leading to a smoother project execution.

To fully leverage the benefits of design-build delivery, the analysis suggests focusing on two key areas: project definition and team selection. Similar to the strategies for mitigating challenges, clearly defining the project scope and ensuring the client's requirements are well-documented in the contract remain important. This upfront investment in clarity minimizes ambiguity and fosters a smoother design-build process. The analysis also reiterates the importance of building a well-rounded design-build team. By selecting personnel with expertise across all stakeholder groups – contractor, consultant, and client – the project benefits from strong collaboration and problem-solving throughout its lifecycle. This not only maximizes the advantages of design-build but also contributes to a successful project outcome.

The analysis suggests that while design-build offers advantages like clear accountability and better risk management, overcoming communication and coordination challenges is crucial. Success hinges on pre-project planning with clear communication protocols, well-defined contracts, and selecting a skilled design-build team. By addressing these aspects, stakeholders can leverage the benefits of design-build for a smoother project execution.

#### **4.4 Discussion**

This study attempted to examine the opportunities and challenges of design build delivery system on Abay bank head quarter building project. The finding of this study indicates that the main challenge to implementing a design build project at the Abay headquarters building is a communication and coordination issue. This was in line with findings from the literature that showed poor communication and coordination between designers and contractors which leads to conflicts, delays and increased cost as a big challenge(Shahid et al., 2015). the unexpected

delays or cost overruns the most frequently reported challenge adopting design build delivery system at Abay bank new head quarter building project. Findings from other study showed that the single source responsibility of the design build team can mask cost issue during the design phase, leading to the later problem(Molenar,K.R. & Soger,A.W., 2012).

The respondents in this study indicated Difficulties in risk allocation between the design build organization and the client as a challenge of adopting design build delivery system. In other study discusses that one of potential pitfalls of design build is difficulties in allocating risks. Uneven bargaining power where owner might try to shift too much risk onto the design build contractor, leading to potential problems during project execution(American bar association, 2019).

The need for clients to make decisions more quickly was mentioned by study respondents as another challenge. This was consistent with research that examines a variety of design-build challenges, including the necessity for prompt client decisions. It also emphasizes the significance of pre-project planning and clear communications to guarantee that clients are ready to make decisions on time during the design development phase.(Mostaan et al., n.d.). According to the results of another study, one of the disadvantages of the design-build delivery system is the need for prompt decision-making and client involvement(Federal highway administration, 2013). The responders advise early and efficient communication as a way to lessen these difficulties. They emphasized how important it is to discuss issues with the consultant and the employer in order to move the project along more quickly. The results of another study demonstrated the difficulties that novice users encounter in design-build projects as a result of the earlier and less precise information transfer as compared to conventional techniques. It highlights how crucial meticulous preparation and communication are to overcoming these obstacles(Penuelas-Blanco,I. & Li,M., n.d.).

Most respondents said that the project's risk allocation plan—which was specified in the contract—was effective in addressing challenges. This was consistent with research findings in the literature that highlight the significance of a contract that allocates risk fairly and clearly. It highlights the challenges of assigning blame for mistakes or omissions in designs, which can result in disagreements and overspending(Berman A., 2010).

As the majority of survey participants note, making decisions quickly is one way to lessen the difficulties encountered. Pre-project preparation and good communication guarantee the

client's quick choice during design development, according to other study findings(construction industry research institute(CII), 2003).

The responders to this study suggest improved design build team selection, improved project requirements and scoping, and early and continuous communication protocols as ways to lessen the difficulties in future design build initiatives.

The design-build delivery approach offers potential in spite of its challenges. Abay Bank's new head office building project is one of the first opportunities to use a design-build delivery approach, according to the majority of survey participants. Additional research revealed that having a single point of accountability had several advantages, including facilitating communication, making dispute resolution easier, and eventually increasing project efficiency(American society of civil Engineers, 2017). Another study revealed that the distinct chain of accountability for project results is one of the benefits mentioned. This makes allocating responsibilities, monitoring progress, and spotting issues easier, improving project control overall(Turner construction company, 2014).

One of the benefits of employing a design-build delivery approach, according to the majority of survey participants, is improved risk management. Additional research revealed the possibility for better risk control in design-build initiatives. It highlights how proactive risk assessment and mitigation strategies are made possible by early collaboration between designers and contractors(American council of Engineering companies(ACEC), 2017). The majority of survey respondents cited better risk management as one advantage of using a design-build delivery strategy. More investigation turned up the possibility of improved risk management in design-build projects. It emphasizes how early collaboration between designers and contractors makes proactive risk assessment and mitigation techniques possible(Walker,D.H. et al., n.d.). It is evident from the data that the design-build delivery system's opportunities and problems at the Abay New Headquarter Building Project are well-represented by both quantitative and qualitative studies.

In order to fully capitalize on the advantages of the design-build delivery method, the majority of survey participants suggest improving project requirements and scoping. A clearly defined project scope is one of the essential components of a successful design-build delivery system, according to previous study findings. During the early stages of design, the design-build team

can utilize its collective experience to refine requirements, resulting in a project that is more efficient and economical(Songer,A.W. & Molenaar,K.R., 2010). Moreover, additional research shown how early and continuous communication between the owner and the design-build team permits continual refinement of the project requirements and guarantees a well-defined scope that is in line with the owner's goal(American institute of Architects(AIA), 2016).

In order to maximize the advantages of the design-build delivery method, respondents to this survey also suggested improving the selection of design-build teams. According to other research, choosing a team with a track record of accomplishment, suitable experience, and effective communication skills is crucial to ensuring project delivery success(Design-build institute of America(DBIA), 2018). Additional research also demonstrated that choosing a team with a track record of productive cooperation and an emphasis on innovation can greatly enhance project outcomes(Kwon,H.B., 2010).

The implementation of the design-build delivery system on the Abay Bank head office building has generally resulted in the following challenges: difficulties with risk distribution, unexpected delays or cost overruns, communication and coordination issues, and the need for customers to make choices more swiftly. To lessen those difficulties Crucial elements, include risk allocation in the contract, prompt customer decision-making, and early and efficient communication. Improved design build team selection, refined project requirements and scoping, early and ongoing communication protocols, and refined project requirements are needed to lessen the obstacles in future design build projects. The benefits of using a design-build delivery system for the Abay Bank head office building include improved risk management, a single point of accountability, and a clear chain of accountability. Utilizing the Design-Build Delivery System's potential benefits, improved project requirements, and improved scoping Improved choice of design-build team

## **CHAPTER 5: CONCLUSION AND RECCOMENDATION**

### **5.1 Introduction**

This study's primary goal was to evaluate the opportunities and difficulties associated with the design-build delivery method for the Abay Bank's new headquarters project. The study's specific goal was to pinpoint and analyze the main obstacles to the design-build delivery system's implementation on the Abay headquarters building project, as well as to provide solutions or mitigations for these obstacles. In order to gather study-related information and maintain the study's dependability, the researcher used both primary and secondary data sources. As a result, questionnaire guidelines were developed in line with the objectives of the study, and respondents were chosen using a census procedure that involves studying the entire population. The study's findings have been examined, debated, and interpreted. Therefore, in this chapter, the researcher summarizes the key findings, conclusion and also recommendation for future Design build project execution in the project.

### **5.2 Summary of Finding**

The study's main conclusions are outlined in this part after data gathered through Interview, observation and panel discussion were analyzed. Communication and Coordination Issues are the first set of difficulties and solutions related to employing a Design-Build delivery approach for the construction of the Abay Headquarter building project. Issues in coordination and communication between designers, contractors, subcontractors, and the client were the biggest obstacle found. Finger-pointing, missed information, delays, and misunderstandings may result from this. Unexpected delays and cost overruns were obstacles in the construction of the Abay headquarters. Unexpected delays and cost overruns can happen even with a streamlined process because of significant mid-project design changes, ill-defined change order procedures, and poor communication.

Another problem that was noted was the question of who is responsible for design flaws or omissions that have an influence on construction when risk is transferred from independent design and construction entities to a single Design-Build team. Another difficulty is the client's need for quicker decisions. To keep the project on schedule, Design-Build necessitates quicker customer decision-making regarding design aspects, material selection, and change orders.

Early and Effective Communication Is a Strategy Used to Mitigate Challenges in the Abay New Headquarter Building Project, Per the Study All parties involved—the customer,

consultant, and contractor—needed to communicate often in order to address obstacles and solve problems more quickly. Risk Allocation in the Contract: Having a clear contract that outlined duties and obligations helped to reduce difficulties that arose during the project. Making Decisions Quickly: Challenges were lessened by the client's attempt to make decisions more quickly while still consulting the project office and upper management on important decisions.

The results of the study indicate that early and ongoing communication protocols are necessary to mitigate challenges in future projects: It is essential that all parties involved establish clear channels of communication and keep in regular contact with one another. Improved Project Requirements and Scoping: Having well-defined and comprehensive project requirements and a work scope reduces uncertainty and change orders in the project's latter stages. Improved Selection of Design-Build Teams: Project management, design coordination, and quality control are all improved by choosing a Design-Build team that consists of knowledgeable and competent individuals in every field. Future Design-Build projects can avoid the difficulties faced in the construction of the Abay Headquarter building project and achieve greater success by putting this advice into practice.

The interview results indicate that the following are the main advantages of the design-build delivery method for the Abay new headquarters building project: Clearly defined responsibilities: It is the only duty of design-builders to make sure the project satisfies all specifications, which streamlines communication and lessens finger-pointing. Decreased Level of Administration Design-Build streamlines the process by doing away with the need to oversee separate contracts for both design and construction. Better Risk Management and Single-Source Responsibility: Risk management is made easier and accountability is made clearer when there is just one organization in charge of design and construction. Several discrepancies were noted in the qualitative and quantitative outcomes of the opportunity and challenge of the design-build delivery method.

The analysis's conclusion demonstrates the strategies used in the Abay new headquarters building project to take advantage of design-build benefits. Pre-Project Scheduling and Team Assignment (Enhanced Project Specifications and Scope): Uncertainties and change orders were reduced when a thorough scope of work was included in the contract documentation. A participant proposed utilizing the current agreement as a starting point while exerting pressure on the contractor to produce superior results. Optimal Design-Build Team Selection: Selecting

a design-build team comprised of seasoned experts in every field promoted improved communication, early problem detection, and a more effective design-construction procedure. In order to take use of their knowledge, one responder recommended incorporating important parties such as facilities management and end users early in the design process.

These results imply that by emphasizing efficient administration, transparent communication, and selecting a skilled design-build team, the Abay project effectively took advantage of the advantages offered by the Design-Build method. Nonetheless, certain answers suggested possible avenues for enhancement, such creating more adaptable contract conditions that encourage surpassing minimum standards.

### **5.3 Conclusion**

The design-build delivery system's benefits and problems are exemplified by the Abay Headquarter building project. Challenges: The project ran into problems with risk distribution, unexpected delays and cost overruns, communication and coordination problems, and client pressure to make decisions more quickly. Mitigation Strategies: Early and regular communication, explicit risk distribution in the contract, and a customer drive for quicker decision-making were how the project overcame these obstacles. Suggestions: By defining precise communication guidelines, improving project specifications and scope definition, and choosing a highly skilled Design-Build team, future projects can further reduce difficulties.

Possibilities and Leveraging Benefits: By creating a clear chain of accountability, lowering administrative costs, and enhancing risk management via single-source accountability, the project effectively took advantage of Design-Build's potential. By assembling a team with extensive professional expertise, they improved communication and design efficiency.

Looking Ahead: Although the Abay project was successful, contract flexibility may be improved to encourage going above and beyond minimum standards. All things considered, Design-Build is a feasible alternative for project delivery; but success requires careful planning, communication, and team selection.

## 5.4 Recommendation

Based on the findings about the challenges and opportunities of the Design-Build system in the Abay Headquarter building project, here are some recommendations for future projects:

- Create a communication strategy that specifies the roles, duties, and processes for each stakeholder—the client, designer, contractor, and subcontractors—in detail. Regular meetings, procedures for exchanging information, and a dispute resolution procedure should all be highlighted in this strategy. Invest in a thorough project requirements document that outlines the objectives, performance criteria, and scope of the work. This lessens uncertainty and lowers the requirement for changes made mid-project. Establish a stringent hiring procedure for the Design-Build team, giving priority to candidates with a track record of successful Design-Build projects, communication skills, and demonstrated experience. To obtain insightful information, think about include important parties early in the decision process, such as facilities management and end users.
- Throughout the project, stick to the predetermined communication plan and be in constant communication. Promote open communication and proactive problem-solving between all involved parties. Create a precise change order procedure that describes the stages involved in submitting, examining, and approving changes. This reduces expenses and prevents conflict. Put into practice a risk management strategy that identifies possible hazards, allocates accountability for mitigating measures, and creates backup plans.
- Provide a clear definition of risk allocation in the Design-Build contract, outlining who is accountable for delays, unforeseen site conditions, and design faults. If the Design-Build team meets performance goals or goes above and beyond the baseline requirements, think about adding incentive clauses to the contract. This may encourage efficiency and creativity.

### **Suggestion for Future Research**

This study only examined the challenges and opportunity of design build delivery system on Abay head quarter building project. and also, strategies used to mitigate the challenges encountered and leverage the opportunity of using design build delivery system. The study recommends that further research should be conducted on a cost-benefit analysis comparing the Design-Build delivery system to traditional design-bid-build for similar projects at Abay Bank. This can help determine the most cost-effective approach for future endeavours and explore the broader applicability of Design-Build within Abay Bank. Identify other potential projects where Design-Build might offer advantages, considering factors like project complexity, budget constraints, and desired timelines.

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## **ANNEX**

### **Questionnaire**

#### **General Introduction**

**Dear respondent,**

My name is Demitu Seyoum, at Addis Ababa University's College of Business and Economics School of Commerce, I am a postgraduate student. Currently, I am conducting my project work entitled "Assessment of Challenges and opportunities of design build project delivery system: The case of Abay bank headquarter building" in partial fulfilment of the requirement for the degree of master of Arts in project management.

My study aims to assess challenges and opportunities of using design build delivery system on Abay head quarter building project. I believe that this study will contribute to and assist the knowledge gap in the area. You are part of the respondents whose views on the project work topic are important and therefore I am respectfully requesting that you complete the questionnaire. Remember: This is solely for academic purposes and your response will be kept strictly confidential and anonymous.

Thank you for your time, co-operation, and contribution.

Demitu Seyoum

Cell phone: +251926839938

Email address: demituseyoum2121@gmail.com

## General Instruction

- ✓ No need of writing your name/address
- ✓ To those questions with alternative mark your response on the space provided by putting “√”
- ✓ For any additional opinion or explanation, you are kindly requested to write briefly on the space provided.

## PART ONE: General Information about the respondents

### 1. Gender:

Male                       Female

### 2. Age:

20-30                       30-40

40-50                       50-60

### 3. Role in the Project:

Architect                       Engineer

Contractor                       Client Representative)

### 4. Educational Background:

PhD                       MSc/MA                       BSc/BA

Diploma                       Other (Please specify) \_\_\_\_\_

**5. Years of experience in the construction industry:**

- Less than 5 years       5-9 Years  
 10-14 Years       Above 14 years

**6. Current position/responsibility in your company**

- Project manager       Coordinator       Resident Engineer  
 Site supervisor       Office Engineer       Other (Please specify) \_\_\_\_\_

**7. Your primary area of work**

- Design       Construction  
 Operation and Maintenance       Other(Please specify)-\_\_\_\_\_

**PART TWO: Design-Build Implementation:**

Scale of Agreement
1= Very Low (VL)
2= Low (L)
3=Medium (M)
4=High (H)
5=Very High (VH)

3. What were the biggest challenges encountered during the DB project delivery for the Abay Bank Headquarter building?

Challenges encountered during the DB project delivery for the Abay Bank Headquarter building	Level of Impact				
	VL	L	M	H	VH
Communication and coordination issues between design and construction teams					
Difficulties in managing changes to the project scope					
Unforeseen delays or cost overruns					
Challenges in risk allocation between the design-build entity and the client					
Limiting Competition					
High Tendering Costs					
New Method & Unfamiliar with Process					
Client Needs to Make Quicker Decisions					
Clients Bringing Design Requirements > 30% (Reduces the Innovation)					
Other (Please specify)					

2. How effectively were these challenges addressed during the project?

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3. What recommendations would you suggest to mitigate these challenges in future DB projects?

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4. In your opinion, what were the significant opportunities or benefits observed due to the DB project delivery system in this project?

Opportunity or benefit observed during the DB project delivery for the Abay Bank Headquarter building	Level of Impact				
	VL	L	M	H	VH
Improved project efficiency and faster completion time					
Enhanced collaboration and innovation between design and construction teams					
Greater cost certainty and potential for cost savings					
Streamlined decision-making process					
Reduced Administration					
Single-Source Responsibility					
Quality Equal or Better Than D-B-B					
Innovation					
Cost Savings					
Projects Completed Faster					
Improved Risk Management					
Early Knowledge of Total Costs					
Accountability					
Other (Please specify)					

5. How effectively were these opportunities realized during the project?

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6. What strategies were implemented to leverage the potential benefits of DB in this project?

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**Additional Comments:**

Please share any additional insights or comments you have regarding the use of the DB project delivery system for the Abay Bank Headquarter building

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**Thank you for your participation!**

## Interview Questions

1. What were the biggest challenges encountered during the DB project delivery for the Abay Bank Headquarter building?

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2. What recommendations would you suggest to mitigate these challenges in future DB projects?

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3. In your opinion, what were the significant opportunities or benefits observed due to the DB project delivery system in this project?

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4. What strategies were implemented to leverage the potential benefits of DB in this project?

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