

ADDIS ABABA UNIVERSITY



**ADDIS ABABA INSTITUTE OF TECHNOLOGY
SCHOOL OF CIVIL AND ENVIROMENTAL ENGINEERING
(CONSTRUCION TECHNOLOGY AND MANAGEMENT MAJOR)**

**A STUDY ON PROBLEMS AFFECTING THE INTEGRATION OF MAJOR
CONSTRUCTION PARTIES IN DESIGN-BID-BUILD PROJECT DELIVERY
METHOD IN THE ADDIS ABABA 40-60 HOUSING CONSTRUCTION PROJECTS**

Author: Gebrehana Tadesse Derbe

Advisor: Dr. Abraham Assefa Tsehayae

**A Thesis Submitted to School of Graduate Studies in Partial Fulfillment of the
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Technology and Management)**

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ADDIS ABABA INSTITUTE OF TECHNOLOGY



SCHOOL OF CIVIL AND ENVIRONMENTAL ENGINEERING
CONSTRUCTION TECHNOLOGY AND MANAGEMENT STREAM
A MASTER THESIS ON

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METHOD IN THE ADDIS ABABA 40-60 HOUSING CONSTRUCTION PROJECTS**

BY GEBREHANA TADESSE

APPROVED BY BOARD OF EXAMINERS:

<u>Dr. Abraham Assefa</u>
Advisor	signature	date
.....
Internal Examiner	signature	date
.....
External Examiner	signature	date
.....
Chairman	signature	date

Declaration

I, the undersigned, declare that this thesis is my original work and has not been presented for a degree in any other university. All sources of materials used for the thesis have been acknowledged.

Name: Gebrehana Tadesse Derbe

Signature:

Place: Addis Ababa University, School of Graduate Studies,
Addis Ababa Institute of Technology

Date: November 2016

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Abstract

Construction industry is a major player in the economy of countries by generating employment and wealth to the nations. However, in design-bid-build project delivery, many projects in developing countries like Ethiopia experienced extremely high disintegration among the major parties. In this respect, this study's objective was to identify the major problems affecting the integration of these parties in Addis Ababa 40-60 saving houses of construction projects. For this, both questionnaire survey and selected case studies were conducted. Accordingly, interpretation and discussion were made on the basis of results.

The study was conducted on 13 Addis Ababa 40-60 housing construction projects within the focus group of clients, consultants, contractors and regulatory body. Accordingly, the research came up with the following conclusions. To begin with the needed level of project parties' integration is not achieved. Besides, 24 integration problems were identified in survey study and ranked based on their importance index. Self-serving objectives; lack of coordination; lack of trust and reliability among contracting parties; and disregarding contextual issues, poor communication between relevant construction parties, and lack of knowledge by the client about project processes and integration issues, and inadequate technical skill by the client are among the major integration problems. Furthermore, two additional problems were identified in the case study. The research concludes that level of integration among the parties was not totally fragmented nor fully integrated due to several integration problems, and further provides recommendations on how to improve the existing situations.

Key Words: Addis Ababa housing projects, construction, design-bid-build, project delivery, integration, and parties.

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Abbreviations/Acronyms

AASHE	Addis Ababa Saving House Enterprise
AASHCP	Addis Ababa saving houses construction projects
ACI	Agile Construction Initiative
AIA	American institute of Architects
CMAA	Construction management association of America
CM	Construction Management
DBB	Design-Bid-Build
DB	Design-Build
FTA	Federal Transit Administration
IT	Information Technology
IM	Interface management
IPD	Integrated Project Delivery
LoA	Level of Achievement
MoUDHC	Ministry of Urban Development, housing and construction
PMI	Project Management Institute
PrLoA	Project Level of Achievement
RII	Relative importance indices
TCS	Trauner consulting services
USA	United States of America

1. Introduction

1.1 Research background

The construction industry is a major player in the economy of countries as it generates employment and wealth to the nations. For instance, among the public construction projects being undertaken in Ethiopia, the program of Addis Ababa 40-60 saving houses of construction project is playing a significant role in terms of job creation and it will contribute in supply of house to the public. The concept of 40-60 housing project is a new strategy by the government to solve the growing housing problem in the country. This program is existed since July 2012, and it was established with the aim of building and distributing houses to the middle class segment of the city dwellers, who can afford to save 40% of the cost of the houses, while the rest 60% will be facilitated by a bank loan from the Commercial Bank of Ethiopia (CBE) - hence the name of the project is given 40-60 accordingly.

However, the fragmentation characteristics of the construction projects in the traditional project delivery approach has affected the construction sector's development in many countries (Latham, 1994; Wubshet, 2004). This is because the fragmented operational agreements in the traditional approach have a negative impact on the services of the many parties at work and efforts of various teams, due to separate and sequential process of works (Wubshet, 2004). This is because works can be decomposed in different packages. These packages are designed in sequential manner and procured to different contractors through bid, and even different trade contractors can be awarded for these different packages. In this case, the works are operated through the various parties' involvement.

This aspect of the fragmentation problem is due to the fact that construction projects usually involve many stages, starting from the establishment of the client's requirements through to design, construction, utilization and eventual disposal of the facility. These stages of the project's phases and the associated activities and tasks are often undertaken as separate processes, with only limited integration of data/information, participants, tools and procedures (Anumba, 2000).

Within the involvement of these participants in the construction projects, such as clients, consultants, construction contractors, subcontractors and material suppliers, integration

problems can arise (Constructing Excellence, 2011). This kind of relationship induces project delays, difficulty in resolving claims, cost overruns, litigations, and compromise project quality (Moore et al, 1992). Moreover, teams and individuals who may not have previously worked together but need to be well integrated, as well as substantial diversity in skills, knowledge and expertise, have made the integration more difficult to achieve within the construction period (Baiden et al, 2006). In addition, the process of integration in a team does not happen automatically, since it may be challenged by different problems (Constructing Excellence, 2011).

This research work aims to identify the problems of integration among construction parties with particular reference to the construction of Addis Ababa 40-60 saving houses of construction projects. Thus, it is necessary for the construction parties to identify integration problems which affects their collaboration. By using literature review, in depth interview, survey questionnaires, and conducting case study, this study will analyze the responses about the integration problems affecting the integration of major construction parties involved in the construction of Addis Ababa 40-60 saving houses projects. The researcher tried to ensure that all respondents in the study of Addis Ababa 40-60 saving houses of construction projects have the necessary expertise. Finally, recommendations are presented according to the results of analysis in the hope of identifying the main integration problems for better performance of Addis Ababa 40-60 saving houses of construction projects and similar construction projects undertaken in the future.

1.2 Problem statement

Construction projects involve many stakeholders who possessed common but at the same time competing interests and objectives. This is increased in the case of public projects in developing countries like in Ethiopia. Besides, the development of project management is under transformation from its traditional perspective to a natural system perspective. The natural system thinking required the integration of parties and several disciplines. These parties and disciplines themselves do possess their own different and competing objectives (Wubshet, 2004).

The Ethiopian Ministry of Urban Development, Housing and Construction (MoUDHC, 2014) indicated that the concerned construction parties need to integrate together for the better performance of construction projects. The report indicated that there is no integration of construction parties to provide sufficient project cost, quality and standard approval procedure among them. The projects execution is not based on pre-determined issues due to the loose of responsibility and accountability among construction parties while performing their jobs in the construction projects (MoUDHC, 2014).

In addition, the Ethiopian construction industry is too fragmented through the exclusive usage of the traditional project delivery approach (design-bid-build). The degree of awareness, commitment and trust developed among stakeholders in the traditional project delivery method is very negligible in the public construction projects in Ethiopia which led to disintegration among the construction parties (Wubshet, 2004).

Particularly, Fortune (2013) report noted that there is an integration problem among the construction parties in the Addis Ababa 40-60 saving houses of construction projects. The report indicated that a total of more than 1,000 contractors, consultants, small and micro enterprises and suppliers are involved in the 40-60 saving houses of construction projects. In the meantime, the client is trying to finalize and handover completed houses in the shortest possible time. But, situations, which may initially seem insignificant, can hinder the overall construction process and the project could not succeed due to the lack of integration of all participant parties in the project. The report also added that there is no integration among all parties to achieve a common goal rather different reasons were raised by different parties (Fortune, 2013).

Hence, the main challenge would be to enable these contrasting demands be aligned and integrated to a common goal. The integration of these stakeholders and disciplines together with the need for alignment of their objectives towards the common goal, without denying the importance of individual objectives are, therefore, a necessity. Thus, it is the focus of this study to identify problems affecting the integration of major construction parties which have been performing in Addis Ababa 40-60 saving houses of construction projects.

1.3 Objective of the research

The main objective of the research is to identify the current integration problems affecting the collaboration of major construction parties in the case of Addis Ababa 40-60 saving houses of construction projects. Based on the problems stated, this study is undertaken with the following objectives:

1. To identify problems affecting the integration of major construction parties in design bid build project delivery method for the case of Addis Ababa 40-60 saving houses of construction projects.
2. To identify critical integration problems (from the identified integration problems) affecting the integration of major construction parties in design bid build project delivery method for the case of Addis Ababa 40-60 saving houses of construction projects.
3. To draw conclusions and recommendations.

To achieve and address the above stated objectives the study is framed by the following research questions:

- i. What are the problems affecting the integration of major construction parties in design bid build project delivery method for the case of Addis Ababa 40-60 saving houses of construction projects?
- ii. Which integration problems are the most critical affecting the integration of major construction parties in design bid build project delivery method for the case of Addis Ababa 40-60 saving houses of construction projects?

1.4 Relevance or significance of the research

The relevance of this research is to fill the gap on a commonly observed problem of integration among the major parties in Addis Ababa 40-60 saving houses of construction projects. This research intends to identify integration problems so as to realize well integrated and coordinated construction parties in the future.

1.5 Scope of the research

This research on integration problems among the major parties in Addis Ababa 40-60 saving houses of construction projects is limited in scope to the followings:

1. The study is limited to city governance of Addis Ababa 40-60 saving houses of construction projects.

2. The study focused only on integration problems from the design phase to completion of construction phases. This is because in the city governance of Addis Ababa 40-60 saving housing construction projects parties' contractual agreement and their availability on site is present from design to construction phase. Thus, the researcher could only study major parties.
3. Only integration problems among contractors, consultants, clients and regulatory body are studied in this research. This is because these parties are usually the principal parties for the construction of Addis Ababa 40-60 saving houses projects.
4. According to the Ministry of urban development and construction (MoUDHC, 2013), Ethiopian Grade-1 contractors and Grade-1 consultants (the highest level) have more resource requirement including manpower. Besides, it indicated that these contractors and consultants perform large project size based on their greater category and they have experience on complex projects with the involvement of different disciplines. Accordingly, this study focused on Ethiopian Grade-1 contractors and Grade-1 consultants involved in the Addis Ababa 40-60 saving houses enterprise project offices, and Ministry of Urban Development and Housing. Thus, the research's result should be taken as indicative of the major integration problems affecting the integration of the major construction parties.

1.6 Methodology of the research

This research started with unstructured literature review during proposal preparation so as to get an in-depth knowledge of the subject area attributed to integration problems affecting the integration of major construction parties; to identify those integration problems; and to identify suitable research methods for data collection and analysis. Detailed literature review was done once the main research work started, with the objective to carry out further investigation on research methods to confirm or adjust the methods identified at proposal preparation stage.

The survey study focused on major public implementing offices carrying Addis Ababa 40-60 saving houses of construction projects. Consequently, Addis Ababa 40-60 saving houses of construction projects offices, contractors, consultants, and Ministry of Urban Development and Housing were the focus of survey study. The data collected from survey was analyzed, interpretation and discussion are made based on the findings of the analysis.

Furthermore, case study was conducted to further study and to identify the integration problems in the actual construction site of selected projects.

Finally, conclusions will be made and recommendations will be forwarded according to the findings of the analysis and discussions.

1.7 Organization of the thesis

The thesis is organized into six chapters. The first chapter depicts the basic research information as an introduction part of the research. Then chapter two covers the detailed literature review on the construction industry and integration problems affecting the collaboration of major construction parties in the construction projects. The chapter is followed by research design and methodology presented in the chapter three. Survey study analysis and selected case study analysis with in depth discussions of findings are presented in the fourth and fifth chapters respectively. There, in-depth interpretation and discussion was made with the analysis of findings. The last chapter presents the conclusions and recommendations of the research.

2. Literature Review

This chapter summarizes the most relevant previous research conducted to date related to the objective of this research. The author reviewed the related literature in the following main topics: construction project in general and characteristics of construction project, major parties involved in each phases of civil engineering project, project delivery methods and integration problems among the major construction parties, and construction parties' integration trend in different countries.

2.1 Background

Construction industry is one of the key industries of any country. But, these days, construction projects in general and building construction projects in particular are becoming more and more complex. One of the main challenges in construction industry is the need for integration of construction parties for the construction of buildings as per the project definition and requirement. These integration problems mainly take place at any construction project phase (i.e., initiation, planning, design, construction, or close out), and to eliminate these problems, they must be properly identified. Once the problems are identified, it is easy to prevent their occurrence. For this reason, effective construction management is essential which deals with identifying the factors that cause integration problems (La Hart, 2007).

The way in which a project is carried out, the way tasks are distributed among parties, and the analysis of the various success factors of a project all ultimately affect the success of a project. In order for a project to be successfully executed a proper execution of the various responsibilities, tasks, and parties of a project need to be coordinated effectively (La Hart, 2007).

The type of project delivery system chosen for a given project also relies heavily on how the tasks and responsibilities of that project are distributed. Understanding the exchange, assembly, and continuing actions of tasks, parties, and responsibilities is best achieved by creating good collaborative environment. According to La Hart (2007), there is almost no project that is finished without any problems, but a variety of issues in construction projects can be reduced through the integration of all aspects of the project.

2.1.1 Construction projects

The Project Management Institute (PMI) has defined a project as "A temporary endeavor undertaken to create a product or service." (PMI, 1996; PMI, 2000). This definition is thought to be appropriate for the construction project in this research.

2.1.2 Characteristics of construction project

Generally, the construction industry is labeled as a 'traditional industry' which adopts new technologies and practices at a slower rate as compared to other industries such as the IT, manufacturing and automotive. It is an extremely fragmented and sequential project delivery system whereby projects are incepted by clients, designed by consultants and implemented by contractors in a very fragmented manner (Egan, 1998).

In most cases, the place of production of construction has to be necessarily the place where the product is going to be used; and it is changing regularly with workers constantly moving from one site to another, cooperating with different partners in fixed term nature. This determine the structure of the industry including the creation of many small firms, each forming temporary groupings upon project basis for the duration of the project. Moreover, the outputs of construction are generally large, heavy, durable, expensive, heterogeneous, and immobile; and the characteristics of location of production and location of products, with products immobile, the construction market is mostly restricted to be local.

Unlike most consumer products that are readily produced in bulk, the demand for the product of the construction industry is generally only produced upon the initiation of, and to the requirements of the clients in terms of what product that they want.

These construction projects are developed in steps and continue to be elaborated and expanded as the work on the projects progresses in separated processes where various feedback loops reinforce the previous processes and enhance the elaboration processes.

Moreover, construction projects are not an end to a goal by themselves; rather, they are a means to a goal which are usually incepted to stratify a certain business need or service. (PMBok) (PMI, 1996; PMI, 2000; and Egan, 1998).

2.1.3 Construction project phases

Every construction project has certain phases of development and passes through a number of distinct stages as it develops. Hence, in this research, the process of an average civil engineering construction project can be described by the following stages (Abebe, 2014; Akram, 2009; Jon, 2009; Agile Construction Initiative (ACI), 1997; FTA, 2007; Juliana et al, 2005):

- **Conceptual planning and feasibility study:** - begins with the recognition of a need for a new facility. Feasibility study is performed before designers start preparing drawings and before field construction can commence. Element of this phase include conceptual analysis, technical and economic feasibility studies and environmental impact reports.
- **Design stage:** -is outputs of the conceptual phase. Conceptual phase is further developed during the design and planning (development) phase to make them ready for implementation. Design phase has two main stages.
 - **Preliminary Design:** - (typically up to 30% design completion) includes architectural concepts, evaluation of technological process alternatives, size and capacity decision and economic studies (Juliana et al, 2005).
 - **Detailed Design:** - (typically from 30% to 100% design completion) involves the element process of successive breakdown, analyzing and designing the structure and its elements it complies with the recognized standards of safety and performance set of explicit drawings and specifications that will tell the constructors exactly how to build the structure in the field (Juliana et al, 2005).
- **Construction stage:** - refers to the phase where the physical construction begin to take shape. This is where the planning and designing principles are transferred to engineering practicalities. Elements of this phase include manufacturing, delivery, civil works, installation and testing in the time where the facility is to be built. The construction facility is substantially completed and after final testing and necessary maintenances, it will be in full operation at the end of this phase.
- **Close out and commissioning stage:** - is a process for validation of building equipment and systems in coordination with operations personnel and third parties. In the commissioning phase the project will be checked and balanced to ensure that the documentation, manufacturing requirements, and systems, equipment, and operations are integrated, validated, and accepted.

- **Operation, maintenance and retirement phase:** - is the utilization of the facility with a periodic or non-periodic maintenance until its retirement that represents the end of the project's life cycle.

For the applicability of this research, the stage from design and planning phase to the construction phase of a project will be considered for the study of integration problems among the construction parties in Addis Ababa 40-60 saving houses of construction projects. Thus, the integration problem during the operation and maintenance; and retirement stage is not included in this study. Fig.2.1 shows a typical sequence of principal stages for construction project under a design-bid-build contract delivery system.

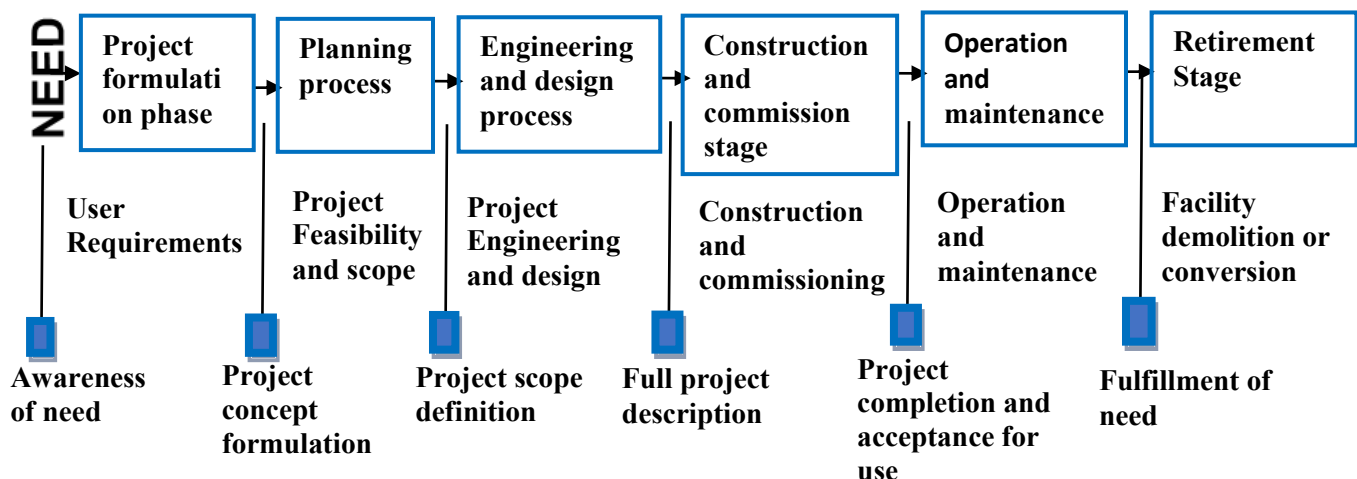


Figure 2.1: Civil engineering project stages for design-bid-build contract delivery system

(Abebe, 2014; Akram, 2009; ACI, 1997; FTA, 2007; Juliana et al, 2005)

Thus, it can be concluded that design-bid-build project delivery system generally offers the owner reasonable security of pricing and presents an orderly approach to the project. However, design-bid-build contract delivery system is a linear approach whereby one phase is completed prior to the next phase beginning and requires a lengthy investment of time and money before the owner obtains its facility for revenue purposes. For instance, before the selection of contractor for the construction, the design task shall be completed by the consultant. This implied that the major construction parties' work become dependent on the output of the other in this sequential process.

2.1.4 Major Parties involved in construction projects and their responsibilities

In general, stakeholders are individuals or groups who have a vested interest in a given issue. In the construction context, stakeholders are parties who will be interested in projects undertaken or products delivered by the industry. They can be classified as positive or negative depending on their interest and direct or indirect (internal or external) depending on their involvement on the project. Stakeholders are parties who could have a telling effect on the success or failure of the project (Abebe, 2014; Akram, 2009; Jon, 2009; Agile construction initiative, 1997; FTA, 2007; and Juliana et al, 2005).

In the construction arena, the major stakeholders of the construction industry are the contractors who implement the projects, the consultants who design and supervise the works, the client who finance the projects and the regulators who regulate how the industry and its actions functions. In addition to this, party who usually is involved in the actual execution of the projects are the user who actually use the final product of the project. Accordingly, in this research, the major parties who participate in the construction industry in DBB project delivery are elaborated as follows (Abebe, 2014; Akram, 2009; Jon, 2009; Agile construction initiative, 1997; FTA, 2007; and Juliana et al, 2005).

2.1.4.1 Clients/Owners

Clients are the parties (public or private) under whose sponsorship the project is executed and comes up with the investment needs such as project idea, land, capital etc. In public projects, besides the client, government institutions (other than the direct client body) may also take interest in the project. In Ethiopian context, the major public client in the construction industry include, the Addis Ababa saving houses of construction projects under the Ministry of Urban Development and Housing (MoUDHC).

In this research, the duties and responsibilities of the owner are described as follows (CMAA, 2012):

- Selects planner for the development of the project specification and definition,
- Selects the designer for design and planning services,
- Awards contract to low bid contractor, and
- Oversee all contract relationships; active participation through the entire sequential process

2.1.4.2 Consultants

Consultants, professional bodies, are one of the major construction parties who design the project. Once the client has an interest and has a source of fund for the project, the consultants usually develop the client's idea and change into economic and constructible artifact. During that time the consultants make sure that design satisfies requirements, usually prepare bill of quantities (BOQ) and contract documents. In addition to this if they are assigned to supervise, they will among other duties:

- Look after proper execution of project,
- Certify payment certificates and contract administration, and
- Issue provisional and final acceptance certificate.

2.1.4.3 Contractors

Contractors are the parties that change the drawings and specification made by the consultants into a physical structure. After the design is completed, the contractors are invited to prepare a bid document based on the client's preferred method of bidding system. Once the contractors are selected, they provide the resources needed to execute the project and perform the project based on the execution plan in which the client and contractor have agreed up on and with approval of consultant. Besides, the contractor has a responsibility of coordinating the subcontractor to deliver the project on time.

2.1.4.4 Statutory bodies

These are usually the government bodies that look after the project's compliance with the general public's interest. They usually perform the following activities:

- Prepare a general development scheme and make sure that the project satisfies that,
- Look after the safety, legal and commercial issues associated with the project, and
- Look into the environmental, cultural and social effect that the project induces.

In Ethiopia, the major statutory bodies involved in the building construction industry includes: Municipalities, bodies who are given the mandate to look after urban housing construction and its associated legalities; Ministry of Construction, the body issue construction related license and has mandated to regulate and promulgate bylaws, codes and standards intended to promote efficiency, transparency, accountability as well as growth in the industry (MoUDHC, 2014); Ministry of Works, Urban Development and Housing, the party has mandate to regulate works, urban and housing and promulgate bylaws, codes and standards to urbans and housing; and Ethiopian Construction Project Management Institute

(ECPMI), body which look the overall performance of construction projects and provide alternative technologies and ensuring efficient construction project management to the industry.

2.1.4.5 Other stakeholders

In this research, the researcher mainly focused to study problems that are cause of poor integration among major construction parties (contractors, consultants, clients and regulatory body) in the construction of Addis Ababa saving houses of construction projects. This includes Addis Ababa 40-60 saving housing enterprise as client, contractors, consultants and MoUDH as regulatory body.

However, there are other stakeholders which may have an important role in construction projects and the researcher appreciate their importance even though they are not included in this study. This includes the following construction participants:

- **Suppliers:** are parties that supply varies materials, equipment and services needed for the project,
- **Financers (Financial institutions):** are donating or loaning agencies or institutions like banks, insurances and pension agencies who could provide loan services for the project,
- **Workers in the industry:** are professionals, occupational or unskilled laborers who earn their living from working in the industry or its supply chain,
- **Project product users:** are parties who may be using the end product of the project, and
- **The general public:** are communities of the locality, the general society of a country or even the globe who may have a vested interest in the project.

2.1.5 Construction project delivery methods: From traditional to integrated approach

Juliana et al. (2005) define the generic term “project delivery system” relates to the particular contractual arrangements for the approach implemented and utilized to accomplish the goals of a given project including: organization, risk allocation, assignment of responsibilities, pricing and payment obligations. Trauner consulting services Inc. (TCS, 2007) defined project delivery system from the construction perspective as the overall processes by which a project is designed, constructed, and/or maintained. It is a system designed to achieve the satisfactory completion of a construction project from conception to use. This definition is used throughout this research.

According to TCS (2007), for any given project, there is likely to be more than one project delivery approach that would be appropriate, and there may be one approach that is best suited, depending on the owner's requirements and capabilities.

Besides, because of financial, organizational and time constraints, various project delivery methods have evolved to fit particular project and owner needs. The most commonly used delivery methods today are: Design-Bid-Build (DBB), Construction Management (CM at Risk and CM at Agent), Design-Build (DB), Integrated Project Delivery (IPD), and their variations (CMAA, 2012).

2.1.5.1 Traditional approach/Design-bid-build

The traditional (design-bid-build) project delivery method typically involves three sequential project phases: the design phase, which requires the services of a designer who will design the project; the bid phase, when a contractor is procured; and a build or construction phase, when the project is built by the contractor (CMAA, 2012). The DBB project delivery assumes that clients benefit from choosing project parties which are selected competitively for every project they engage on (Egan, 1998); and risks and changes are minimized through detailed descriptions of specifications and contracts (Latham, 1994). This sequential separate system of project delivery, however, is believed to be a barrier to use the skills and knowledge of contractors in design and planning of the projects (Latham, 1994). It prevents parties from developing collaboration on past relationships and also leads to the adversary relation. The reason is that the aggressive competition on price forces parties to lower their bid price so as to win the project and assume that they will compensate through change requests which results the industry to be destabilized (Egan, 1998).

In the public sector, this has traditionally used almost exclusively which involves the separation of design and construction services and sequential performance of design and construction. In this project delivery, the construction project phases are divided in different segments among the major parties which are involved in each phases as shown Figure 2.2.

In the traditional project delivery method, there are two primary contracts as shown below in Figure 2.2:

- Owner-consultant (i.e., architecture, planning or engineering firm)
- Owner-general contractor

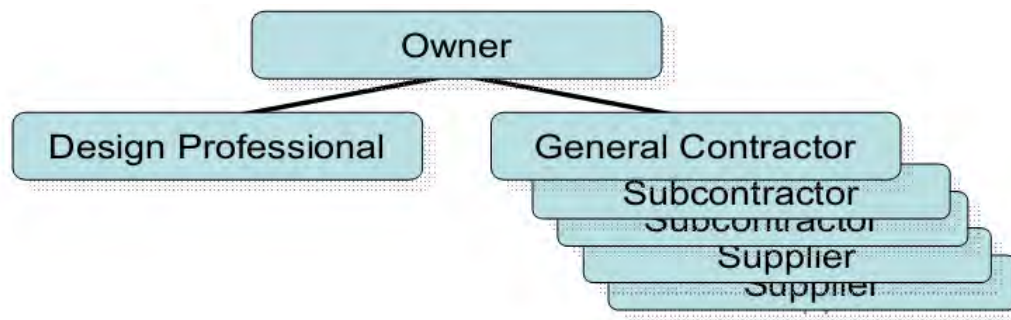


Figure 2.2: Traditional project delivery method (Juliana et al, 2005)

Juliana et al (2005) stated that during the traditional project delivery, the client enters into the contract with the design professionals (usually consultants who design and administer the project) and with the general contractor who realizes the projects. Then, a general contractor may select one or more subcontractors to perform some of the work under the general contractor's oversight and coordination. This is also one means for the general contractor to shift risk to other parties. The studies (Juliana et al, 2005; and CMAA, 2012) described advantages and dis-advantages of the design- bid-build approach as follows:

Advantages of the design- bid-build approach:

- Owner obtains reasonable security of pricing when the winning bid is accepted,
- Presents orderly approach to the sequence of design and construction work,
- Due to the high degree of design completion (in theory), changes in the work should be minimal and limited to unanticipated issues, and
- Allows owner significant opportunity for involvement in the selection of design details.

Disadvantages of the design-bid-build approach:

- The linear approach requires more time for overall project cycle from conception to final completion,
- Owner bears the financial risk without knowing the overall price throughout the entire design and bid phase. The owner may find out the project is not viable financially until the design process is completed and bids are received. Bids may be received which exceed the design professional estimate that could threaten project viability,
- Owner still retains some financial risk due to changes during construction,
- Design professionals may not have sufficient construction experience to provide appropriate constructability reviews to reduce cost of construction or eliminate

problems that are not recognized until construction begins. The risk of these unanticipated cost increases are borne by the owner, and

- The contractor controls all work within the construction notice to proceed date through the final completion date. The owner has little control or influence over the schedule unless contract requirements indicate the owner's involvement, or unless the owner wishes to pay the contractor for the right to control schedule as a change to the contract.

The design-bid-build approach is in very common use today, in both public and private contracting.

2.1.5.2 Other project delivery methods

Even though this study focused on the DBB delivery method, there are other project delivery methods which are available for the choice of the owner depending on the project size and the risk transfer to the contracting party as they are described below.

Design-Build (DB): - This method is used when large engineering and construction firms, with the capability of performing all the engineering, design, procurement and construction themselves or teams are formed consisting of an engineering firm and a construction firm joining together (joint venturing) for the project's total execution (Juliana, 2005).

Design-Build-Operate-Maintain (DBOM): - When a public entity contracts with a private entity to design, build, operate, and maintain a public asset, this type of approach is applied.

Design-Build-Finance-Operate-Maintain (DBFOM):- In this approach, a public entity contracts with a private entity to design, build, operate, and maintain a public asset. Additionally, the private entity will also finance the project in exchange for either user fees, lease payments or some other revenue stream.

Construction Management (CM): - Whereas on larger, more complicated projects, owners often utilize a professional outside firm to perform construction management (CM) services, representing the owner in overseeing the activities of the contractor(s) performing the construction on site. Depending on the circumstances and the owner's ability to assume risk, the outside construction manager might be assigned as "**Agent for**" the owner with clearly defined areas of authority for committing the owner financially, authorizing payments, proactively negotiating and approving changes, and resolving disputes. In some cases, the construction manager might be asked to manage the project "**at risk**", meaning that at some point in the project it would be required to agree to a not-to-exceed price for the work, thus

again providing a level of financial protection for the owner. The CM at Risk essentially becomes a general contractor after providing any advisory services during the design phase (CMAA, 2012).

Engineering procurement construction (EPC): - In this method, in addition to undertaking the design and engineering for the project, the EPC Contractor is usually required to procure, on behalf of the owner, all of the materials, equipment and construction works necessary for the proper completion of the project (Damian, 2006).

Integrated project delivery (IPD): This is a late coming project delivery approach that integrates people, system, business structures and practices into a process that collaboratively harness the talents and insights of all participants to optimize project results, increase value to the owner, reduce waste, and maximize efficiency through all phases of project. IPD requires a multiparty agreement among the prime players in the design and construction process at least the owner, the consultant and the contractor, but this agreement can include many of the important sub-consultants and sub-contractors as well. This multiparty contract is a team-based approach and it promises better outcomes, but outcomes will not change unless the people responsible for delivering those outcomes (AIA, 2007).

Multi-Prime Contracting approach: - This approach is derived from DBB project delivery. In such case, an owner contracts directly with separate trade contractors for specific elements of the work, rather than with a single general contractor (CMAA, 2012). When the owner uses multiple prime contractors, the owner is obligated to schedule and coordinate the work of the contractors so as to avoid interferences between the various companies performing the work (Juliana et al, 2005).

Labor contract: - Regarding the project cost contractual agreement, the client and the contractor may enter into the contract either to supply all necessary material, labor, and machinery and equipment or supply labor only to execute the work. Depending the choice of the client, labor based contract may be incorporated in the contract for which the contractor is required only to provide labor price for the execution of project. However, depending on the agreement, this may include the machinery and equipment cost. In this contract type, the contractor is entitled to provide the professional and non-professionals for the delivery of the project. In this case, the client is responsible to deploy all the materials.

2.1.6 Factors to considered in selecting a project delivery system

An owner has several areas of concern when getting on a construction program or project. It is necessary to choose an overall project delivery and contracting strategy that effectively and efficiently delivers the project. The following are some of the key considerations that will influence the selection of the project delivery method for a project (CMAA, 2012 and Juliana et al, 2005):

- Understanding of the objectives and needs of the owner and the project,
- Project costs and with what is the risk level of exceeding this cost,
- Owners' decision how they need to have over the design elements of a project and the schedule is to minimize schedule duration for a project, and
- Understanding the various approaches, their risk profiles, their benefits and disadvantages.

Even though, the choice of project delivery differs from owner to owner, these above factors are properly evaluated and a good decision can be made on the selection of a project delivery method that best fits the goals and requirements of the owner and the project.

2.2 Integration problems among major construction parties in DBB delivery method

2.2.1 General

DBB project delivery approach within the construction industry has been criticized due to its fragmented feature (Latham, 1994). Often when problems arise, the risk of cost overruns and delays will be carried by the owner until the responsible party can be determined and proven. Frequently, the consultant and contractor deny responsibility and blame the other party as being responsible (CMAA, 2012).

Moreover, even though DBB project delivery approach follows a sequential process and does not encourage integration of the parties involved to form effective teams, the various project parties themselves in the project might not able to collaborate and do not work together as expected to deliver projects effectively due to the poor teams' practices adopted an different factors throughout the whole project processes (Forgues and Koskela, 2009; Constructing Excellence, 2011; and Tsai *et al*, 2010). This implied that if parties made a significant effort to work together, the overall performance of construction projects through the involvement of many parties might be achieved, and DBB by itself may not be a problem instead it is a sequential process method. Thus, DBB could be chosen for the delivery of projects when the

client wants to assign design to design professionals, construction works to contractors in which the work could be executed by respective and competitive entity if the parties have no problem of integration throughout each phase of projects (CMAA, 2012).

The study conducted by Gisela G. (2013) indicated that personnel competence for the job, effective planning and control, commitment to project goals, effective communication between projects participants have been identified by various studies as key factors leading to realization of successful construction projects. The study pointed out that effects of unintegrated processes/stages and project team efforts influence “optimal project outcomes.

This implied that optimally integrating the DBB project delivery system and the efforts of project management from the start, delivers expected project outcomes particularly the achievement of ‘sustainability goals’. Way (2005) in his soft landings, introduces a systematic way of ensuring sustainability of projects by integrating feedback of “continual assessment” of project design into the construction phase (Way, 2005). Therefore in theory, in the projects procured through DBB the project delivery method, positive project outcomes could be achieved when projects participants ensure effective project management practices. Thus, in order to ensure these teams successfully complete their projects, it is necessary to identify the major integration problems among the major participants for DBB project delivery application.

2.2.2 Definitions

Different researchers define integration from different perspective. As Heather M. (2007) cited the study of Mitropoulos *et al* (2000), integration is defined as “the process of achieving unity of effort among the various organizational subsystems in the accomplishment of the organizations’ tasks”.

From the construction perspective, Baiden *et al* (2011) defined ‘integration’ as collaborative working practices, methods and behaviors that promote an environment where information is freely exchanged among the major construction parties. Baiden *et al* (2006) also stated that ‘integrated construction project team’ is a highly effective and efficient collaborative team responsible for the construction projects throughout the whole phases. By examining the above definitions, integration is bringing all of the participants involved in executing a

construction process or processes to work together while having a common goal and unified culture throughout the whole phases of projects (Mokbel, 2009). Accordingly, this definition is adopted for this research.

Likewise, many definitions of interfaces exist by different researchers in the construction sector. However, in this research, based on previous researches, an interface is generally considered to be the link between construction elements, phases, construction parties and different disciplines is thought to be applicable for this research (Shokri *et al*, 2012; and Sebastiaan, 2014). Accordingly, interfaces arise during the decomposition of a project into different contracts, phases, and parties within the presence of many disciplines. The design, construction and management of a building construction involve the integration of construction parties in practical context (La hart, 2007).

2.2.3 Integration in project phases in the DBB project delivery

According to the definition of integration, when everything and everyone is working together as one large unit, a project is considered to be fully integrated, which would be the ideal solution for everything involved in a project to work together. Certain aspects like a project type, project phase, and parties involved, technology used and the contractual arrangements can affect integration in a project. La hart (2007) indicated that over the last few decades a large part of the construction industry's low performance rating in the United Kingdom has been blamed on because of disintegrated and fragmented project teams. Even though getting everything to work just perfectly and everyone to agree on everything does not happen all the time. Thus, there are different levels of integration for each project.

The degree of integration in a construction project varies on the type and phase of the project; and numbers of parties involved in such a project. Different phases require a different level of integration because each phase is different and involves a varied interaction among different parties in a project (La hart, 2007 and Mokbel, 2009). La hart (2007) indicated that integration at the initial stage of a project within the owner's organization was a key issue. Thus, during the design phase, integration is essential and critical because it helps to prevent problems in subsequent processes and also allows for selection of alternatives that can

optimize the overall performance of the project. In order for this to happen, participation from all parties is crucial to enhance such integration issue (La hart, 2007).

Moreover, during the construction phase of the project, the responsiveness of the organization of the project becomes also important. The uncertainty that comes with the physical and business environment of a project requires constant interaction and response in order to make fast and effective corrections if needed to optimize the productivity of the project. In the public sector of construction, it has been demonstrated that the construction phase of a project was the most important for integration. This is because the more disintegrated the construction parties and processes are, the more difficult it is to organize everything, meet schedule demands, stay within budget and make decisions. The parties involved in different phases of projects with respect to their responsibilities during each phase are shown below in the Table 2.1.

Table 2.1: Construction stakeholders involved in different phases of construction projects (Wubshet, 2004).

Conceptual phase	Planning and design phase	Construction phase	Commissioning phase
Input			
Problem or opportunity, project brief, project charter	Approval to go ahead with design and development	Approval to construction project	Commissioning, notification of completion
Process			
Feasibility study	Design product, develop detailed program: WBS, budget	Solicit tender and award contracts, administer contracts, make the product/solve problem	Start-up and test the product. produce as built drawings, compile knowledge learnt
Major Players			
Client, Economic advisor, Project Manage	Client, Project Manager, Designer, regulatory bodies	Client, Project Manager, Consultant, Contractor, Suppliers	Client, Project Manager, Consultant

Conceptual phase	Planning and design phase	Construction phase	Commissioning phase
Output			
Feasibility study, Project proposal, Execution strategy	Baseline plan, design drawings and specifications	Construction project Completed output	Project closeout report
Approval			
Go/no go decision	To implement project	Ready to commission	Deliverable accepted

From Table 2.1, it is clearly seen that transitions from one phase to another generally involve handoffs of some concrete deliverables. This implies that there is an output which has to be delivered before the next phase is started. For instance, before the planning and design phase, there should be feasibility study report. Likewise, before the construction award, the design has to be completed. In general, deliverables from one phase are reviewed for completeness and accuracy and approved before work starts in the next phase (Wubshet, 2004). As it is stated before, even though the integration is demanding among the construction parties for each phase, the intention of the researcher is focused on the integration among the major construction parties from the planning and design phase up to construction completion phase for the case of Addis Ababa 40-60 saving houses of construction projects.

2.2.4 Level of integration among the construction parties

As described earlier, integration in construction is used to describe the introduction of working practices, methods and behaviors that create a culture of efficient and effective collaboration by individuals and organizations throughout the whole phases of construction projects (Baiden *et al*, 2011; and Baiden *et al*, 2006).

Baiden *et al* (2006) conducted a literature based analysis of dimensions of team integration and summarized these dimension of team integration into ten (10) categories based on key research studies, as shown in Table 2.2 below. From the Table 2.2, it is clear that by integrating team operations against the features enclosed within the table, the extent to which a team can be described as integrated can be determined. Then, using these dimensions of

team integration, they developed the level of integration to give an overall picture of the degree of integration that exist among the construction team in real life of construction projects (Baiden *et al*, 2006). It has revealed that the level of integration is affected by the team practices adopted, and set within the context of the procurement approach. Most of the teams operated as individually competent workgroups within their organizationally defined boundaries, but had the aspiration to work collaboratively with other teams operating within the project environments.

Table 2. 2: Dimensions of team integration, their description and level of integration measured by dimension of team integration (Baiden *et al*, 2006)

No	Dimensions of team integration	Description	Level of integration		
			Full achievement	Partial achievement	No achievement
1	Single team focus and objective	has a single focus and objectives for the project	All members have the same focus and work together towards team objectives	Members pursue individual objectives but in line with the overall project objective	Individually pursued objectives by members without regard or in isolation to others and project objectives
2	Seamless operation with no organizational defined boundaries	operates without boundaries among the various organization members	Members form a new single project team with no individual member identity or boundaries	Members operate as individuals but make efforts to collaborate with others on the project	Continued alignment and affiliation to individual organizations that make up the project team
3	Mutually beneficial outcome	works towards mutually beneficial outcomes by ensuring that all the members support each other and achievements are shared throughout the team	Pursuance and attainment of project goals that benefits all members	Attainment of project goals in conjunction with other members whose involvement are necessary	Individually defined project objectives without compromise or consideration to others needs
4	Increased time and cost predictability	is able to predict more accurately, time and cost estimates by fully utilizing the collective skills and expertise of all parties	Openly accessible design and construction cost information gathering and management	Systematic follow up of design and construction cost information	Disjointed design and construction costs information gathering and application

A Study on Problems Affecting the Integration of Major Construction Parties in Design-Bid-Build Project Delivery Method in the Addis Ababa 40-60 Housing Construction Projects

No	Dimensions of team integration	Description	Level of integration		
			Full achievement	Partial achievement	No achievement
5	Unrestricted cross-sharing of information	shares information freely among its members such that access is not restricted to specific professions and organizational units within the team	Availability and access to all project information to all parties involved in the project	Access to project information by a section or sections of the project team	Project information only available to members with responsibility for the section of work
6	Team flexibility and responsiveness to change	has a flexible member composition and therefore able to respond to change over the duration of the project	Requisite personnel join and leave the project team as their skills are no longer required or are needed	Retention of members no longer required and trained to adopt new requirements	Use of the same project team members even when they had outlived their effectiveness
7	Creation of single and co-located team	has a new identity and is co-located, usually in a given common space	A single project team with all members located together in a common office	Individually operated sub-teams but co-located within a single office environment	Individually located and operated teams
8	Equal opportunity for project inputs	offers its members equal opportunities to contribute to the delivery process	Consultation of members for contribution at all phases of project before decisions are made	Contributions are welcomed but not explicitly invited from members in making decision on the projects	Little attempt to consult members in key project decision-making processes

A Study on Problems Affecting the Integration of Major Construction Parties in Design-Bid-Build Project Delivery Method in the Addis Ababa 40-60 Housing Construction Projects

No	Dimensions of team integration	Description	Level of integration		
			Full achievement	Partial achievement	No achievement
9	Equitable team relationships and respect for all	operates in an atmosphere where relationships are equitable and members are respected	All members are treated as having equal and significant professional capability needed on the project	Recognition of professional competence, but mainly in their respective field of expertise	Team members contribution restricted to their functional project role
10	No blame culture	has a “no blame” culture. There is no complaining others.	Collective identification and resolution of problems Collective. Responsibility for all project outcomes.	Cooperation of team members in resolving problems, but with ultimate responsibility resting with a single part	Individual members are singled out for problems that occur on out for problems that occur on corrective measure

Accordingly, they conducted a study to identify the extent/ level of integration among the project teams using the ten (10) dimensions of team integration. Their study presents the evidence of integration practices to identify the level of integration. In their study, they used three levels of integration measurement: full achievement (if the dimension of team integration is fulfilled by teams fully integrated), partial achievement (if the dimension of team integration is fulfilled by teams partially) and no achievement (if the dimension of team integration is not totally fulfilled by teams).

The study was also conducted on different types of delivery method including CM, DB and DBB approach by which the projects were delivered. They indicated that the level project teams integration among in CM and DB in different projects is high, whereas projects procured through the traditional procurement route (DBB), which have traditionally led to fragmentation of the parties involved but showed some low level of team integration. However, Baiden *et al* (2006) did not identify the factors causing these low levels of integration among the project teams instead they recommended that further study should also be conducted to explore integrated working. This would reveal other factors which can impact on team integration and could show the influence of the clients' team on the efficiency of collaborative work practices.

Thus, in this research, the researcher adopted these ten dimensions of level of team integration to determine the level of integration among the construction parties in the Addis Ababa 40-60 saving houses of construction projects in DBB project delivery application. This is not fully DBB competitive basis, but the application is used as a separate processes. This is because, in the case of Addis Ababa 40-60 saving houses of construction projects, the contractors' technical qualification is evaluated and those achieve the criteria, they enter into the agreement with AASHE to deliver the project in fixed price basis. This indicated that the price is not competitive basis instead it is fixed price set by Ministry of Urban Development and Housing. In addition to this, major materials (cement, reinforcement rebar, and products like precast, hollow and ribbed concrete blocks) are supplied by the client through "bulk material" purchase concept. This concept implies that the client procure the required quantity of materials (for all projects) in its own expense by assuming that when materials are purchased in bulk, the price will decrease in overall cost.

These dimensions of team integration form the basis for identifying the level of integration achievement in the studied projects and to identify the major integration problems among the major construction parties leading to low level of integration. This is because the study of Baiden *et al* (2006) has two important assumptions suitable for this research. The first one is the study is conducted both in design and construction phase. The other one is the level of project parties' integration is evaluated within the presence of construction teams and carried out in multiple projects.

2.2.5 Problems affecting integration among major construction parties

Integration can be started from identifying the problems that directly affect integration among the involved construction parties. There are certain barriers which can restrict integration among these parties for the projects' success. In order to analyze and understand what relates and indicates construction project integration, many researchers have focused on identifying the strengths and barriers of various forms of such collaborative working arrangements (Mokbel, 2009). As a result, many researchers have investigated different integration problems which affect the integration of construction projects through the project life cycle.

Research conducted by Rahman and Kumaraswamy (2005) has presented interesting evidence of an overall awareness in the industry for producing relationally integrated information and project teams during construction phase. Their study was focused on relational contracting, and not directly related to integration challenges in DBB projects. But, it is clearly indicated that these relational contracting affects the integration of the major construction parties indirectly. The researchers proposed and included their study of relational contracting factors, which indirectly impact the integration of major construction parties. Accordingly, they found 31 potential problems of integration which are shown in Table 2.3.

Table 2. 3: Problems affecting relational contracting among the construction teams (Rahman and Kumaraswamy, 2005)

No	Factors deterring relation contracting among the contracting teams
1	Lack of client knowledge about project process and relation contracting
2	Lack of commitment from top management: client
3	Lack of commitment from top management: other party
4	Lack of client's initiatives
5	Bureaucratic client organization
6	Stringent/incompatible public sector rules and regulations
7	Public sector accountability concerns
8	Price-only selection methods and poor contracting system
9	Commercial pressures on contracting parties
10	Opportunistic behavior of one or more contracting parties
11	Lack of trust and reliability among contracting parties
12	Unwilling and unenthusiastic participation of contracting parties
13	Interpersonal and cultural clash (individual level)
14	Incompatible organizational culture
15	Absence of any risk reward plan
16	Separate and unrelated risk reward plans for different parties
17	Exclusion of consultants in risk reward plan
18	Exclusion of major subcontractors in risk reward plan
19	Exclusion of major suppliers in risk reward plan
20	Unfair risk reward plan
21	Lack or absence of contractual relations between client and major subcontractors
22	Lack of any relationships or communications between client and major suppliers
23	Lack of any relationships or communications between consultants and suppliers
24	Lack of any relationships or communications between subcontractors and suppliers
25	Resistance of contracting parties to integrated project culture
26	Failure to share information among contracting parties
27	Persistence of 'master' (e.g. client/ prime consultant) and 'slave' concept
28	Uneven commitment of contracting parties
29	Discontinuation of open and honest communication
30	Improper planning, design errors and omissions
31	Potential legal liabilities in resolving non-contractual issues

According to the Rahman and Kumaraswamy (2005) study, the highest ranked problems that affect relational contracting among the major construction teams were: lack of trust, open communication and uneven commitment, absent or unfair risk-reward plan, incompatible personalities and organization cultures, lack of general top management commitment and client's knowledge and initiative, lack of good relationships among the team players, and exclusion of some team players in risk-reward plan, errors and cultural inoperativeness.

Huang *et al* (2008) conducted a research on integration problems which affect the interaction of construction parties. The study was conducted on track engineering (overlapping of design and construction in sequential order) projects in which the owner and its engineering and construction project teams work together to define elements of the project that can be designed early, thus enabling the construction to proceed while inspection of the design is being completed (CMAA, 2012). Besides, the research was conducted in the involvement of different trade contractors and it addressed the whole project phases and performed a comprehensive investigation to address integration problems in this project (Huang *et al*, 2008). The study was conducted through whole project lifecycle to identify integration problems. Accordingly, they found 28 problems which affect the integration among the major construction parties. A summary of those problems are shown in the below Table 2.4.

Table 2. 4: Problems affecting integration among construction parties (Huang *et al*, 2008).

Category of integration problems	Individual integration problems
Financial problems	<ul style="list-style-type: none">▪ Delay in progress payment by owner▪ Accuracy of the project cost estimate▪ Owner's low budget for construction relative to requirements▪ Price changes of materials and laborers during construction

Category of integration problems	Individual integration problems
Inadequate Contract and Specification	<ul style="list-style-type: none"> ▪ Insufficient working drawing details ▪ Insufficient specifications ▪ Poorly written contract ▪ Change order ▪ Inconsistent planning
Environmental Problems	<ul style="list-style-type: none"> ▪ Weather conditions ▪ Geological problems on site
Other Common Interface Problems	<ul style="list-style-type: none"> ▪ Lack of communication between the construction parties ▪ Slowness of the owner in decision making ▪ Delay in completion of the project ▪ Lack of management supervision ▪ Skills and productivity of laborers ▪ Poor planning and scheduling ▪ Insufficient negotiation ▪ Unfamiliarity with local laws and regulations
Technological improvement	<ul style="list-style-type: none"> ▪ Limited personal experience and defective feedback ▪ Increase of the uncertainty and ambiguity of interface conflict ▪ Emergency of new techniques and new materials ▪ Incompetence for solving new technical problems
Track characteristics	<ul style="list-style-type: none"> ▪ Hardship of coordination between interfaces ▪ Parties' different opinions on mutual views and needs
Cultural difference	<ul style="list-style-type: none"> ▪ Self-interest perspective ▪ Lack of a system updating new information

Huang et al (2008) analyzed those 28 integration problems using statistical technique to identify a relatively small number of problems that can be used to represent the relationships among sets of many interrelated variables. Similar and interrelated factors were categorized

in the same problem category as shown in the above Table 2.2. During their extraction, similar and interrelated factors were categorized in the same problem category based on statistical analysis. Finally, six major factors were determined and they concluded that management related problems, experience related problems, coordination related problems, contract related problems, acts-of-God related problems, and regulation related problems are the most important problems among the major construction parties respectively.

According to the study made by La Hart M. (2007) the lack of involvement of the owner during the design process, lack of enlightened client, lack of knowledgeable client about project processes and integration, and inadequate resources and technical skills by the client are the integration problems which affect the normal interaction of construction parties. The study added that in relation to project integration the owner primarily will come up with those but even the contractor and design professional may have their own requirements and constraints for the project and all parties involved in this phase provides the best strategy to optimize project integration. Besides, a collaboration of each party's ideas and constraints provides the project characterization, time of the project, cost, and project delivery. This is because it may have taken as long time to produce the conceptual design and problems associated to poor integration among the major construction parties' problems are raised from lack of professional skill to make common understanding and communication among them unless the client appointed a construction manager or a consultant representative to the client. Besides, during the construction progress coordination and scheduling tasks, changes, approval of payments and other project related problems' management become so complex if the client of project has no knowledge about the construction project (La Hart, 2007).

Sebastian (2014) conducted a comprehensive investigation on diminishing integration problems across contractual boundaries through interface management to find their related strategies for the purpose of enhancing the alignment and coordination among the construction parties. The study focused on the integration issues related to interface among the construction parties. Accordingly, the study indicated that various project parties and disciplines are often unaware of how their activities affect the construction project delivery or operation of other project cause much more problems (Sebastian, 2014). In Sebastian (2014) study, a numerous integration problems are identified. Accordingly, these integration

problems were categorized into two, which are poor communication among parties and poor coordination among parties:

1. Poor communication among parties

Communication is the activity of conveying information. Construction projects involve many stakeholders, which cannot function effectively without good communication among the participants. This back and forth flow of information is essential for project success. Poor communication causes a wide variety of design errors, conflicts, delays, and project failures, which reduce the overall performance of project participants as well as the quality of the final product. The communication between employees from the same company is usually much better than across contracts boundaries. Sebastiaan (2014) in his study classified poor communication into two categories, which are lack of communication and delayed or ineffective communication.

- **Lack of communication:** - A lack of communication usually arises from a lack of understanding what information is needed. When people do not realize what information is needed for them to execute a task, poor communication will easily arise among parties (Sebastiaan, 2014).
- **Delayed or ineffective communication:** - It also happens that there is no lack of communication, but the flow of information is still delayed or ineffective. Communication could be delayed or ineffective if the information is insufficient, inaccurate or if there are inefficiencies in information sharing among the major construction parties. These may in the long run weaken their mutual relationships (Chen *et al*, 2007).

2. Poor Coordination among parties

A construction project has numerous participants who are more or less interrelated. Coordination amongst them in both design and construction is required to ensure compatibility between subsystems and components and to minimize conflicts in schedules and activities among different contractors. The causes of poor coordination among parties can include the following factors, as is elaborated below (Sebastiaan, 2014).

- **Unaware of responsibilities:** - the responsibility of contractors and disagreements about scopes of work are common problems (Sebastiaan, 2014). If these responsibilities for the whole work and consideration of all contract responsibilities are not clearly defined before

bidding, problems related to the integration are often not recognized as such in the construction industry and affect major construction parties. Therefore, they do not realize that close coordination through organizational boundaries could avoid and resolve most of these issues. This unawareness results in a poor coordination among different project teams.

- **Unwilling to bear coordination and decision responsibilities:** - all parties involved in a project have their own scope of the project and their own interests. It appears to be current design practice that, evidently collaborating specialists, effectively compete for the priority of the values or criteria, associated with their specialties ((Ballard, 1999) quoted in (Sebastiaan, 2014)). When contractors are purely focusing on their own priorities and interests, poor coordination will follow. These issues could lead to poor and inefficient coordination between the different parties.

Magi *et al* (2015) conducted a research on integration problems among the major construction parties during design-construction interface. The study was conducted with the involvement of major participants in the construction projects. In their study, they have developed 35 integration problems which affect the design-construction interface as shown Table 2.5 below. They categorized these 35 integration problems into four parts, namely; factors related to clients, factors related to consultants, factors related to contractors and factors related to skilled labors. Then, a questionnaire was distributed and data was collected for the selected problems, which was analyzed using the relative importance index (RII) method (Magi *et al*, 2015).

Table 2.5: Problems affecting integration among construction parties during design-construction interface (Magi *et al*, 2015)

No	Factors affecting integration of design-construction interface
1	Lack of accuracy in specification and working drawings
2	Involvement of contractor in design conceptual phase.
3	Time limitation in design phase
4	Involvement of contractor in design development phase
5	Lack of communication between designer and owner's family
6	Influence of buildability

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No	Factors affecting integration of design-construction interface
7	Design changes by the owner
8	Lack of human resources in design firm
9	Design complexity
10	Owner's desire to modify the use of space after design process
11	Inappropriate selection of construction materials by designer
12	Inaccurate estimation of project costs by designer
13	Delay in completion of design services
14	Lack of cost indexes for material, labor, and equipment to be used by designer for cost estimation.
15	Designers lack of experience
16	Design complexity
17	Problems with the materials in the market
18	Procurement delays during construction phase
19	Effect of material changes during construction phase
20	Lack of tools and equipment by contractors
21	Shortage of construction materials
22	Lack of skilled manpower
23	Weather conditions
24	Material approval
25	Construction errors at jobsite
26	Poorly written contract agreement document between owner and designer
27	Inappropriate selection of construction materials by designer
28	Owner's low budget for design services relative to requirements
29	Design changes by the owner
30	Slowness of owner's acceptance of final design
31	Inaccurate estimation of project cost by designer

No	Factors affecting integration of design-construction interface
32	Insufficient design communication aids between designer and owner
33	Lack of communication b/n designer and owner's family
34	Designers lack of experience
35	Participants' wrong belief

Accordingly, their study results indicate that design complexity, time limitation in the design phase, lack of accuracy in specification and working drawings, lack of communication between designer and owner's family and participants' wrong beliefs are the most important problems that affects design-construction interface. Whereas, effect of material changes during construction, weather conditions, involvement of the contractor during the design phase revealed as least important problems (Magi *et al*, 2015).

Finally, from these previous studies (La hart, 2007; Maji *et al*, 2015; Sebastiaan, 2014; Huang *et al*, 2008, Rahman and Kumaraswamy (2005); and Sebastiaan, 2014), it is evident that there are different integration problems which affect the integration of efforts of various construction parties and impact the overall performance of construction project.

The study of La Hart (2007) was focused on problems related to conceptual and design stage of the construction projects in relation to lack of professional knowledge by the client about the project processes unless the client appointed a consultant representative to the client. On the other hand, the study of Rahman and Kumaraswamy (2005) was focused on problems related to lack of commitment and poor communication by different parties. Further, Maji *et al* (2015) focused on integration problems related to interaction among construction parties during design-construction interface. However, the main issue with these studies (La hart, 2007; and Maji *et al*, 2015) is that they did not address the problems of the whole project phases; instead, at some project' phases. Moreover, the study of Huang *et al* (2008) and Sebastiaan (2014) are the complete study because it covers a whole project life cycle within the presence of major construction parties in complex project. However, the study of Huang *et al* (2008) is not applicable to purely design-bid-build project delivery system.

In this study, the identification of integration problem will be investigated with the purpose of identifying major problems that affect the integration of major construction parties in DBB project delivery within the presence of these parties from design and planning phase to construction completion phase.

2.2.6 International trend of construction parties' integration in DBB delivery

Here, the international practice of major construction parties' integration is discussed, in order to understand the problems which affect the integration of major construction parties through the DBB delivery method in global context as elaborated as follows:

Integration of construction parties' in UK

The UK construction task force ((Egan (1998) and Latham (1994)) indicated that the DBB is generally sequential processes because it reflects the input of designers, constructors and key suppliers in UK (Latham, 1994; and Egan, 1998).

Later, they have identified that integrated processes and teams is one of the key driver of change which need to set the agenda for the construction industry at large.

The UK construction task force used the key premise behind the integrated project process is that teams of designers, constructors and suppliers work together through project partnering arrangements and are achieving the levels of performance improvement that they have targeted in their study. Even though, the challenge for the UK construction industry was to develop their own integrated teams to deliver the same benefits to occasional and inexperienced clients, the UK construction make it wholly possible (Egan, 1998; and Latham, 1994).

Recently, the UK integrated collaborative working toolkit (<http://icwtoolkit.com/toolkit-guide/online-maturity-assessment/>, 2015) indicated that the UK construction companies can assess their integration maturity online. This integration maturity assessment is designed to help the construction companies assess their position in UK construction industry culture change and/or that of their supply partners. It provides information, advice, guidance and training and indicators to help construction companies find answers that suit their particular projects and challenges.

The toolkit explains the philosophy and drivers behind integrating project teams, utilizing collaborative working methods and approaches to produce teams which operate as if they were effective companies in their own right. It also explains the process, culture, methods and tools required to enable integrated project teams to deliver superior value by integrating through collaborative working, all the collective skills and capabilities of clients.

There is no one group or company applying everything held within the toolkit and many practitioners are functioning at different levels of awareness and performance. However, the toolkit provides a framework for clients, contractors, consultants, advisers and supply chain partners to determine how optimal performance can be achieved and what to seek from each new relationship.

Integration of construction parties in USA

DBB is unquestionably the most prevalent delivery model for the construction projects in United States' construction industry (AIA, 2007). However, in USA, DBB offers very few opportunities for integration. Based on its structure, the DBB delivery model does not permit early involvement of the constructor in design process. The American institute of architects (2007) indicated that DBB does not naturally lend itself to integration due to its rigid phase system. However, in the later time, the USA construction sector used the DBB delivery method with application of integrated project process. In such, integrated project process, owner, consultant, contractor and sub-contractor understood the value of integration and are committed to working as a team in the best interest of the project through all phases of design project. The integrated project process realigns participants' roles, underlying motivations, and sequences of activities on a project to utilize each participant's best talents and abilities at the most beneficial moment. This realignment of traditional roles and project goals, however, inevitably leads to questions about what should be considered along the way toward integration (AIA, 2007).

Integration of construction parties in China

The traditional design-bid-build delivery system is also one of the most predominantly used in China for the construction delivery. Up to the mid 1990s, most of projects financed by World Bank and Asian Development Bank adopt DBB. Furthermore, over 95% of the domestic projects adopt the traditional approach and so far, more efforts were made to learn

from foreign countries with regard to the new project management approaches due to less team integration nature of this DBB delivery method (Bosen, 2006). Accordingly, the China's construction industry used DBB with combination of project management (PM) to create team integration. The study indicated that the education system of China attached importance to "construction project management" and China has worked out many project management software programs by itself, and introduced some foreign common software, for instance, Project 2000 of Microsoft and primavera project planner (P3) of USA. Moreover, the introduction of the new laws, regulations and rules have made the management of Chinese construction industry more standardized and create integration among the major construction participants through the DBB delivery method (Bosen, 2006 ;and Ya Jiang *et al*, 2006).

Integration of construction parties in Nigeria

Similar to the developed countries, developing countries predominantly used DBB delivery methods as a construction delivery method and this project delivery method is still being widely used in Nigeria most especially for the procurement of housing projects and possible in achieving the quality and time objectives of such projects (Benedict, 2012). However, this study indicated that DBB delivery method creates disintegration among the construction parties. For this, Ibrahim *et al* (2014) recommended the application of project management techniques; employ competent personnel and embark on continuous training; invest in knowledge management and; clients and consultants adheres to project management procedures in DBB delivery method.

However, a study made by Daba (2012) in Nigeria presented a unique result that using DBB delivery method, the relationships among construction participants does not affect trust among contracting parties and as such ranked it least among the problems among the contracting parties in contrary to the other international practice.

2.2.7 Integration of construction parties in Ethiopia

DBB delivery system is the most practiced type of delivery system in the construction industry of Ethiopia since the 1987 (Wubshet, 2004). In this type of delivery system, projects are divided into different packages interfacing to each other. Though the design and supervision consultant will be the prime professional on behalf of the owner and largely the

administrator of the construction contract; the employer takes the responsibility of coordinating the various project packages and their respective interfaces. As a result, contracts focused on professional duty of care, not results or project goals, contractors are also responsible to construct works with due care and diligence and complete them in accordance with the contract, but they are not held responsible for design deficiencies (Mekonnen, 2013). Using the DBB method, construction is managed based on ready-made designs by a design team, leaving coordination issues to the client /owner in the Ethiopian construction industry. This DBB project delivery method does not promote integration and weaken contractual relationship (responsibility) between the different parties (Lema, 2006).

Furthermore, the integration practice among the major parties in Ethiopian construction sector in this DBB project delivery method is not practical (MoUDHC, 2014). According to MoUDHC (2014) and Wubshet (2004), the integration among construction parties is very minimal and poor information management among the parties. The reports added that projects cannot be completed on time, budget and within expected quality as well. Thus, the interest of the researcher is to identify the major problems causing poor integration among these parties for the case of Addis Ababa 40-60 saving houses of construction projects.

Finally, according to the definition of integration and national practice of team integration, a range of interfaces would come into existence between or among various parties in Addis Ababa 40-60 saving houses of construction projects. Hence, finding problems affecting integration of major construction parties in DBB delivery method for the case of this construction project will be investigated in this research through the use of designed methodology in the next chapter.

2.2.8 Chapter Summary

It has been learnt from the literature that the construction industry contributes greatly towards the growth and development of the country. For this growth, there are a numerous construction parties which are involved in such industry for the realization of a given construction projects.

The reviewed literature indicated also that procurement is the organizational design that determines the line of relationships and communication between and among project

participants among which are clients, contractors and consultants. The contractual arrangement and organizational deployment of participants for the realization of the building project matters. For a project delivery, there are different construction project delivery approach which can be selected based on interests of clients upon different consideration. This because, choosing the right type of delivery system for a particular project can help achieve the project objectives by increasing the integration of teams for the successful completion of the projects. It is also learnt that the type of project delivery implemented by the owner affects the integration of the project.

Consequently, among different types of construction project delivery approach, DBB is the most predominantly used delivery approach in the national and international practice. This method retains the name traditional because it is a result of the differentiation between consultants and contractors. In this method, the client contacts an architect or an engineer, as the case may be, who appoints other consultants to design, and then construction is awarded to a contractor and it imposes a contractual and organizational separation of design from construction.

In the DBB delivery approach, works are passed through a sequential process by different parties. Thus, the chance of occurrence of integration problems among the construction parties is more relative to the other project delivery method. The literature also indicated that the major construction parties play an important role in each phases of civil engineering project from the concept stage to the completion of the construction project in the DBB delivery method. Moreover, it has been learnt from literature that there are different integration problems which affect the integration of efforts of various construction parties and impact the overall performance of construction projects.

Based on the literature review, lack of professional knowledge by the client about the project processes, lack of commitment and poor communication by different parties, problems related to interaction among construction parties at different interfaces, problems related poor communication and coordination among the major construction parties, management related problems, problems related to construction parties' experience, and contract related problems are some of the integration problems identified in the literature that affect the integration of construction parties at different phases of projects. Additionally, it has been also learnt from

the literature that some of these problems were not explored in the whole project phases; instead, they were identified at some project' phases, some are not applicable to purely design-bid-build project delivery system, and some are studied throughout the whole phases of complex projects within the presence of major construction parties. It is also learnt from the literature that identifying integration problems can be an important input for continuously integration of project teams throughout the lifecycle of the construction project.

Furthermore, the national and international practice of DBB delivery method indicated that it does not promote team integration. It is learnt that the international practice indicated that problems can be occurred that affect the integration of major construction parties in DBB delivery method. However, DBB delivery method can be used with combination of construction project management for enhancing team integration in international practice. Where as in Ethiopian practice, the potential problems are not identified which affect the integration of construction parties. The industry claims that DBB delivery method itself does not promote integration instead identifying the potential problems which affect major construction parties in the sector.

Finally, it has been learnt from the literature review that there are integration problems among the construction parties which affect the smooth collaboration of these parties and affects the performance of construction project through different phases of construction projects in DBB delivery method in Ethiopia. Therefore, to make the construction industry effective, there must be some way to identify the integration problems. This research therefore aims in identifying major integration problems affecting construction parties' integration in the case of Addis Ababa 40-60 saving houses of construction projects in the hope of improving integration of parties; and the performance of Addis Ababa 40-60 saving houses of projects and similar construction projects in the future.

3. Research Methodology

3.1 Introduction

This chapter explains the choice of research methodology for this research. It begins with an overview of the general approach and methods used in the research. The focus of the research is identifying major integration problems among major construction parties in the city governance of Addis Ababa 40-60 saving houses of construction projects in DBB delivery method. Investigating the major integration problems within the presence of local grade one contractors, consultants, clients and concerned governmental regulatory body which Participated in the Addis Ababa 40-60 saving houses of construction projects using DBB delivery method are discussed. The choice of the mixed research method is justified as an appropriate research strategy. The determination of the study sample and the techniques of data collection are also described.

3.2 Fundamental concept

Progress in almost every field of science depends on the contributions made by systematic research; thus research is often viewed as the basis of scientific progress. Broadly defined, the purpose of research is to answer questions and acquire new knowledge. Research is the primary tool used in practically all areas of science to expand the limits of knowledge ((Marczyk et al., 2005) quoted in Getaneh (2011)). Besides, Kumar (2011) described research as one of the ways to find answers to questions, whereas, Abiy *et al* (2009) described research methods as specific research tools (surveys, interviews and case studies) that are used in research projects to gain full understanding of phenomena.

In the other hand, research methodology is a way to systematically solve the research problem and it shall identify the research basis, research questions and research analysis (Kothari, 2004). Abiy *et al* (2009) described research methodology as “the theory of how inquiry should proceed” that “involves analysis of the principles and procedures in a particular field of inquiry.” This involves the researcher’s assumptions about the data collection methods and analysis strategy.

This research was conducted and inquiries were made to identify major integration problems among the major construction parties in the case of city governance of Addis Ababa 40-60 saving houses of construction projects. Accordingly, this chapter covers the research

methodology followed to achieve the ultimate goal of the research to draw up findings in a way to make conclusions and to forward recommendations.

3.3 Research design, approaches and methods

Kumar (2005) described a research design as a procedural plan that is adopted by the researcher to answer questions validly, objectively, accurately and economically. According to Kumar (2005), the following two objectives need to be fulfilled in a research design:

1. To conceptualize an operational plan and to undertake various procedures and tasks required to complete the study.
2. To ensure that these procedures are adequate to obtain answers to the research questions.

Research strategies can be broadly categorized as either quantitative or qualitative. Quantitative research is objective in nature (Johnson and Harris, 2002). It usually requires respondents to record their attitudes, opinions, or beliefs on different-point scale measured with numbers (Krosnick and presser, 2010). Three main approaches were suggested to collect the data: asking questions of respondents by means of questionnaires and interviews, undertaking experiments and performing extensive reviews of the relevant literature (Johnson and Harris, 2002). On the other hand, qualitative research is subjective in nature (Naoum, 2007). It relies on observing people in their own environment, communicating with them in their own language, and on their terms. Case studies are the major types of qualitative study. In addition, a research study using both qualitative and quantitative approaches can be called a “mixed-methods” approach (Creswell, 2009).

3.4 Research methodology employed in this study

3.4.1 Selected research approach type

This research concerns both qualitative and quantitative characteristics, which are explained below:

1. Quantitative aspects of this research:

- The objective of this research is concerned with the identification of major integration problems among the major construction parties in the City governance of Addis Ababa 40-60 saving houses of construction projects using different-point scale measured with numbers.

2. Qualitative aspects of this research:

- Investigation on integration problems affecting parties' integration in the Addis Ababa 40-60 saving houses of construction projects using the selected case study. These are featured with qualitative elements. Interviews and case studies appear to be more appropriate for capturing such relevant information in this study.
- The major integration problems among construction parties can be identified by selected case studies of Addis Ababa 40-60 saving houses of construction projects. This again depends on an overall understanding of the major integration problems in the whole process of a construction projects (planning and design to construction phase) in DBB delivery method.

Therefore, in this research, mixed-method research seems to be appropriate and is helpful in gaining a better understanding through an in-depth study of the new phenomenon based on its qualitative and quantitative aspects of the study.

3.4.2 Selected research methods

The approach to data collection should be based primarily on the nature of the investigation and on the type of data and information that are required. The objective of this study is to identify the major integration problems within the local grade one contractors, consultants, clients and regulatory body. This could be met by employing a diverse range of methods to collect applicable data. This included questionnaires, interviews, and case studies.

3.4.2.1 Survey study

The survey method involves collecting information from the target population, which is selected based on systematic and representative sampling methods by means of a standardized questionnaire administered identically to all the target respondents in the sample population (Creswell, 1994). In this study, the questionnaire survey was used to obtain information about the identification of major integration problems among the major construction parties which were participated in Addis Ababa 40-60 saving houses of construction projects in DBB delivery method. This included local grade one contractors, consultants, clients and regulatory body.

Both close and open ended questions were included in the questionnaire. The close ended questions had a number of choices of possible answers and the respondents selected whatever they feel was most appropriate. Open ended questions were incorporated with

closed ended questions in places where the response options were relatively wide and not included in the questionnaire to specify their answers in specified data measurement of rating scale (Krosnick and Presser, 2010).

When designing a survey response rating scale, it is necessary to specify the number of points on the scale. The study of handbook of survey research by Krosnick and Presser (2010) indicated that two-point scales simply require a decision of direction whereas longer scales require decisions of both direction and extremity. Very long scales require people to choose between many options, so these scales may be especially difficult in terms of scale point interpretation and mapping (Krosnick and Presser, 2010).

Thus, in this research, the response of the questionnaire data was prepared based on the scale of four-point rating scale measurement of the agreement towards each statement from 1 to 4 (not at all a problem), 2 (minor problem), 3(moderate problem), 4(serious problem). The reason to adopting this simple scale is as to provide simplicity for the respondent to answer and to make evaluation of collected data easier to evaluate; and to rank major integration problems as the objective of this research.

3.4.2.2 Interviews

In the event that a questionnaire survey might not easily allow the researcher to investigate some theme highlighted in response to a certain question on the survey (Fellows and Liu, 2008) quoted in (Getaneh, 2011), interviews were employed to supplement the information required. In this research, face to face interview was conducted to get data related to integration problems from the practitioners and professionals to design the questionnaire in addition to problems obtained in the literature review. Moreover, an interview was employed by questioning a respondent to obtain responses aimed to supplement information required during case study in relation to the identification of major integration problems among the major construction parties in Addis Ababa 40-60 saving houses of construction projects in DBB project delivery.

3.4.2.3 Case Study

Gao and Low (2014) quoted that Yin (1994) gave a widely accepted definition of a case study as an empirical inquiry that “investigates a contemporary phenomenon within its real life context, especially where the boundaries between phenomenon and context are not clearly evident”. The case study, in contrast to the questionnaire, allows the researcher to uncover how in daily practice the major problems can affect the work of construction firms (Gao and low, 2014). Generally, in this research, the case studies aimed to give an in-depth understanding of major integration problems within the major construction parties in practice in the case of Addis Ababa 40-60 saving houses of construction projects.

3.5 The research framework

Figure 3.1 outlines the research steps taken in this study. The structure of this research has three stages: Literature review; and two-phased data collection and analysis. Based on the literature review, a lot of integration problems were first identified.

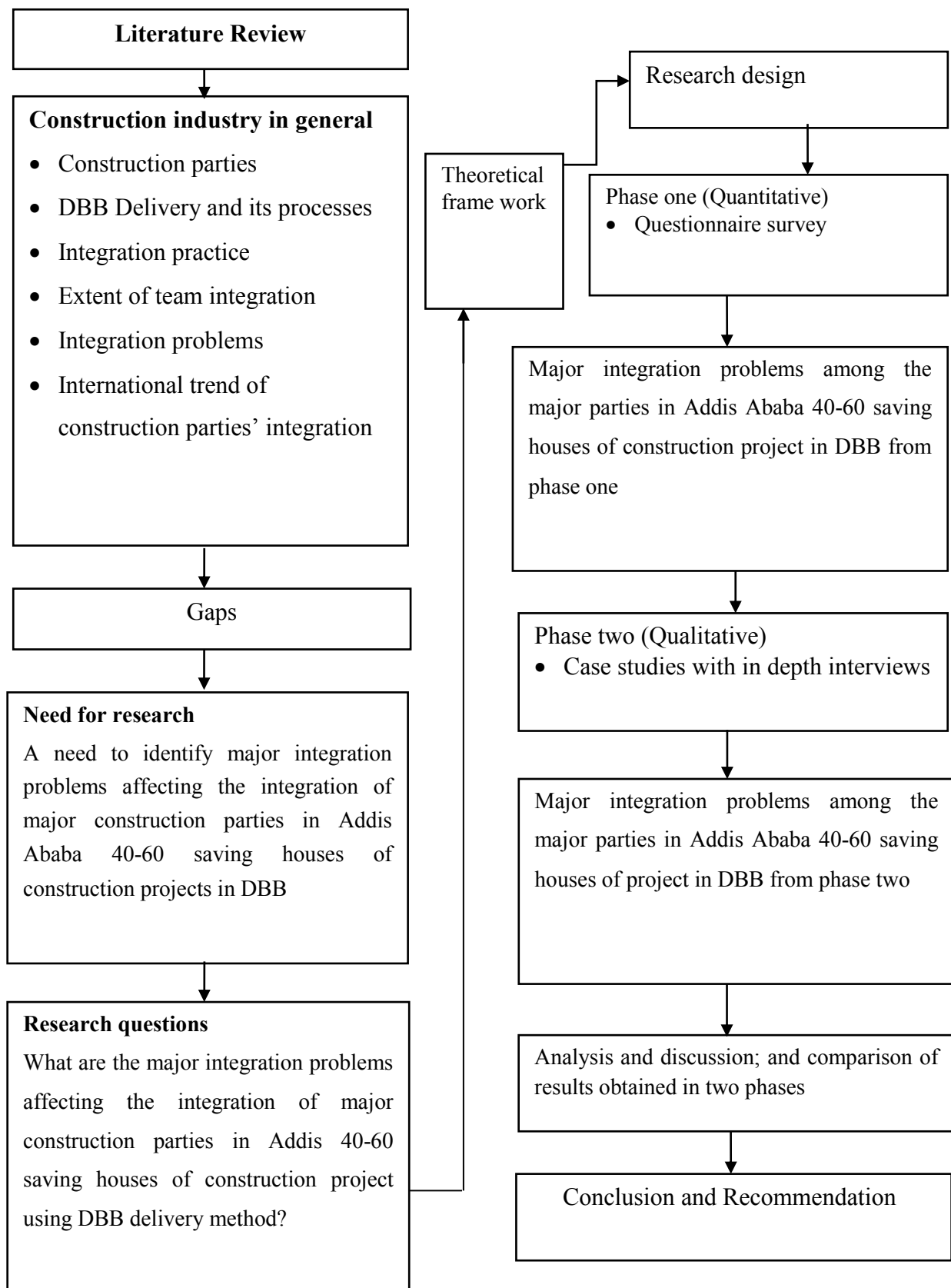


Figure 3. 1: General structure of the research design

Furthermore, all of these previously examined integration problems were categorized into various types of related problems by author's subjective judgments, including management , resource, experience and knowledge, coordination and communication, contract, regulation and government, parties' participation, environmental, and risk and uncertainty related problems .

Table 3.1 below shows the combined integration problems between previous researchers and in this research. In this research, problems which have similar nature and category are grouped and merged in major group. Nevertheless, all of the above integration problems fall under general problems, which may not totally conform to the scope the researcher intend to discuss in this research. Therefore, other important integration problems in city governance of Addis Ababa 40-60 saving houses of construction projects, which are not investigated in literature, should be taken into consideration due to the subject matter of this research.

A Study on Problems Affecting the Integration of Major Construction Parties in Design-Bid-Build Project Delivery Method in the Addis Ababa 40-60 Housing Construction Projects

Table 3.1: Combined integration problems between previous researchers and lists of integration problems in this research

Integration problems identified by previous researchers	Source	Category of problems	Mapping in this research (24 problems)
Lack of commitment from top management: client	Rahman and Kumaraswamy (2005)	Management Problems	Lack of commitment by involved parties
Lack of commitment from top management: other party			
Lack of client's initiatives			
Slowness of owner's acceptance of final design	Magi et al (2015)		Lack of integration management among the contracting parties by the clients
Slowness of the owner in decision making	Huang et al (2008)		
None			Inadequate preparation and planning before commencement of a project
None		Lack of integrated planning and scheduling for different contracting parties	
Delay in progress payment by owner	Huang et al (2008)	Resources related problem	Lack of personnel, financial and physical resources by owners, contractors and consultants for construction project relative to project requirements
Owner's low budget for construction relative to requirements			
Effect of price changes of materials and laborers during construction			
Lack of manpower: Lack of skills and productivity of laborers	Magi et al (2015) and La Hart (2007)		
problems with materials in the market			

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Integration problems identified by previous researchers	Source	Category of problems	Mapping in this research (24 problems)	
Lack of human resources in design firm				
Lack of tools and equipment by contractors				
Shortage of construction materials				
Lack of human resources in design firm				
Shortage of construction materials				
lack of knowledgeable client about project processes and integration, and inadequate technical skill by the client	La hart M. (2007)	Experience and Knowledge Related Problems	Lack of knowledge by the client about project processes and integration issues, and inadequate technical skill by the client	
Lack of client knowledge about project process and relation contracting	Rahman and Kumaraswamy (2005)			
Inaccurate estimation of project costs by designer	Huang et al (2008) and Magi et al (2015)			
Delay in completion of design services	Magi et al (2015)			
Designers lack of experience				
Inappropriate selection of construction materials by the designer				
Design complexity			Technical incompetence and limited personal experience of consultant	
Improper planning, design errors and omissions	Rahman and Kumaraswamy (2005)			

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Integration problems identified by previous researchers	Source	Category of problems	Mapping in this research (24 problems)	
Lack of management supervision	Huang et al (2008)		Technical incompetence and limited personal experience of contractor	
Limited personal experience and defective feedback	Huang et al (2008)			
poor planning and scheduling				
Incompetence for solving new technical problems				
poor construction skills and productivity of laborers				
construction errors on site	Magi et al (2015)			
Lack or absence of contractual relations between client and major subcontractors	Rahman and Kumaraswamy (2005)	Coordination and Communication Related Problem	Poor communication between relevant construction parties	
Lack of any relationships or communications between client and major suppliers				
Lack of any relationships or communications between consultants and suppliers				
Lack of any relationships or communications between subcontractors and suppliers				
Failure to share information among contracting parties				
Lack of communication between construction parties	Huang et al (2008)			
Delayed or ineffective communication	Sebastiaan (2014)			
Insufficient design communication aids between designer	Magi et al (200)			Insufficient design communication between

A Study on Problems Affecting the Integration of Major Construction Parties in Design-Bid-Build Project Delivery Method in the Addis Ababa 40-60 Housing Construction Projects

Integration problems identified by previous researchers	Source	Category of problems	Mapping in this research (24 problems)
and owner			consultant and owner
Persistence of ‘master’ (e.g. client/ prime consultant) and ‘slave’ concept	Rahman and Kumaraswamy (2005)		Self-serving objectives; lack of co-ordination; Lack of trust and reliability among contracting parties; and disregarding contextual issues
Poor coordination among parties	Huang et al (2008) and Sebastiaan (2014)		
Self-interest perspective			
Parties’ different opinions on mutual views and needs			
Discontinuation of open and honest communication			
Lack of trust and reliability among contracting parties	Rahman and Kumaraswamy (2005)		
None		Lack of creating integrated single project team with all members located together in a project	
Opportunistic behavior of one or more contracting parties	Rahman and Kumaraswamy (2005)	Contract related problem	Lack of clearly defined responsibility of each contracting party in the contract for the project
Uneven commitment of contracting parties			
Insufficient working drawing details and specifications for the works	Huang et al (2008)		Inadequate design information in the contract
design change order			
Poorly written contract			
Insufficient negotiation			Inadequate contract and specification

A Study on Problems Affecting the Integration of Major Construction Parties in Design-Bid-Build Project Delivery Method in the Addis Ababa 40-60 Housing Construction Projects

Integration problems identified by previous researchers	Source	Category of problems	Mapping in this research (24 problems)
Price-only selection methods and poor contracting system	Rahman and Kumaraswamy (2005)		Lack of modern contracting system among construction parties (such as partnering)
Public sector accountability concerns	Rahman and Kumaraswamy (2005)	Regulation and government related to designers	Bureaucratic client organization and greater process and administrative rules and regulations
Bureaucratic client organization			
Stringent/incompatible public sector rules and regulations			
Unfamiliarity with government audit system	Huang et al (2008)		
Unfamiliarity with local laws and regulations			
Unwilling and unenthusiastic participation of contracting parties	Rahman and Kumaraswamy (2005)	Participants Related problem	Unwilling and unenthusiastic participation of contracting parties
Resistance of contracting parties to integrated project culture			
Participants' wrong belief	Magi et al (2014)		
Lack of involvement of contractor in design process	Magi et al (2014) and La Hart (2007)		Lack of involvement of contractor in design development phase
Interpersonal and cultural clash (individual level)	Rahman and Kumaraswamy (2005)		Interpersonal and organizational culture difference
Incompatible organizational culture			
None			lack of strong, professionally experienced and responsible client

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Integration problems identified by previous researchers	Source	Category of problems	Mapping in this research (24 problems)
Geological conditions	Huang et al (2008)	Environmental problems	Geological conditions
weather conditions			weather conditions on site
Absence of any risk reward plan	Rahman and Kumaraswamy (2005)	Risk and Uncertainty related problems	Absence of any risk reward plans for different parties
Separate and unrelated risk reward plans for different parties			
Exclusion of consultants in risk reward plan			
Exclusion of major subcontractors in risk reward plan			
Exclusion of major suppliers in risk reward plan			
Unfair risk reward plan			

Accordingly, for a greater comprehensive understanding of integration problems in city governance of Addis Ababa 40-60 saving houses of construction projects, several face-to-face interviews were conducted to procure other prominent integration problems possibly occurring in this construction projects but not mentioned above to design the questionnaire. Most interviewees who are well-known experts or practitioners in design-bid-build approach for the case of Addis Ababa 40-60 saving houses of construction projects provide extremely precious feedback and advice such that further subjects could be added to this research. According to their opinions, the following are the most talked about unique aspects, namely, ‘inadequate preparation and planning before commencement of a project’, ‘lack of strong, professionally experienced and responsible client’, ‘lack of creating integrated single project team with all members located together in a project’, and ‘lack of integrated planning and scheduling for different contracting parties’, are likely to bring about deterioration in the integration of major construction parties in city governance of Addis Ababa 40-60 saving houses of construction projects. The detailed explanation of each unique characteristic are listed as follows.

1. Inadequate preparation and planning before commencement of a project

Adequate preparation and planning before commencement of project is the key factor in construction projects. Without an appropriate management system that undertakes necessary preparation and planning, there will not be any suitable reference for making future decisions. Since the supply of Addis Ababa housing construction projects need the involvement of many construction parties (which further involves different disciplines), development of scope of works, readiness of project site, and proposed financial and time planning the commencement of construction projects without making sure the preliminary issues of project results disintegration of parties throughout the process of project.

2. Lack of strong, professionally experienced and responsible client

In the traditional project delivery method, the client usually deploy the full responsibility of design and contract administration to the consultant. In this case, the client is not required to have a construction professional since the consultant have to act in behalf of the client, and the consultant must carry out its responsibility. However, in addition to the design professional, the client may have in house staff (his own staff to coordinate and control the

construction processes) and might take the coordination responsibility and wants to enter into the process of construction projects in his own interest. In this case, if the client wants to involve or participate throughout the processes of construction projects, it is essential that the client has to professionally experience to actively follow up and control the construction parties in each process of construction project. In the case of Addis Ababa 40-60 housing construction projects, the client deploy its own staff in addition to the assigned consultant in each project site. This because, the consultants' jobs were not totally left to them and it is worth mentioned that the consultant is not believed by the AASHE to deliver their full responsibility. This indicates that the consultants are not able to manage without repeated request by the client to take positive action for the success of projects and lacks the professional competency. Accordingly, the client entered intervention to look the overall performance of construction projects and control the parties' responsibility. In this case, if the client has to do so, the client's experience and strong commitment is crucial to follow up, and control, and evaluate the job of each party stated in the contract document timely and rationally. Otherwise, without responsible client which has an experience of coordinating contracting parties, trying to intervene in the processes might create a gap of integrating contracting parties in a construction project where the client is interested to enter interference and wants to manage the project in its own interest within the participation of various parties in the processes. Thus the client has to assign a competent consultants to design and administer the project and left the project for them; and once the client assigned a consultant in competitive basis, the consultant has to carry out the responsibility for the expected project outcome. Or, in addition to the design consultant, if client is interested to involve and manage the project in their own interest without denying the other parties involvement, the client has to have construction experience and strong commitment.

3. Lack of creating integrated single project team with all members located together in a project

In Ethiopian construction industry, construction parties lack creating integrated team with all members of the parties together in a project so as to see projects requirements collaboratively. Each contracting parties are often unwilling to team integration issues and regardless of the possible loss to others and the entire project. If some party strongly insists on their own view, there will be competition and arguments within the integration and thus the entire project will

get deferred. For this, the involved parties are likely to make decisions resulting in their own benefits instead of the benefit of the whole. They are willing to make every effort to avoid their own mistakes that lead to financial penalty or loss of profit, instead of considering the situation of others and conducting timely coordination for them.

4. Lack of integrated planning and scheduling for different contracting parties

There are too many parties involved in a design-bid-build construction project to have a good understanding of mutual standpoints and needs among all the parties in each phases of the project.

With the involvement of these many and separate contracting parties which do not have any relationship may affect the integration of major construction parties. These many separate and unrelated contracts is often not clearly specified that each parties are deemed to better involve in the project, and that the integration of these parties has to be tested jointly otherwise it may affect the integration of parties. This is because certain parameters are not defined, planned and scheduled early in integrated manner such as which party/parties do their task at what time and similar questions are not addressed; therefore the emergence of different and unrelated parties in the project without integrated planning and scheduling for those separate and different parties will result in poor integration among the major construction parties.

Finally, the total list of integration problems is shown in Table 3.1 which are proposed for the in the survey study. In view of that, the researcher intends to identify affecting the integration of major construction parties in the city governance of Addis Ababa 40-60 saving house construction projects.

3.5.1 Survey sampling

The population of a research is defined as the units belonging to the category of study (Creswell, 1994). In this study, the population is grade one contractors, all consultants (their numbers are small), clients and regulatory body which all were participated in Addis Ababa 40-60 saving houses of construction projects. Using the resource requirement namely "equipment and machinery"; and "manpower", the MoUDC (2013) categorized Ethiopian contractors from “grade one” to “grade ten”.

Referring to classification by MoUDC (2013), grade one contractors participated in Addis Ababa 40-60 saving houses of construction projects fall in the large category, and thus appear the population of this study. The reasons that the study is focused on these grade one contractors are:

1. They play the most important role in Ethiopian's construction industry, and thus represent a typical business model in terms of management style, site management practices, human resource management, and others in Ethiopia.
2. Grade one contractors have more resource and perform large project size similar to 40-60 housing construction project and interact with other construction parties in this large project size project. Thus, the researcher believed that these grade one contractors have an experience of the integration issues which may require managerial effort among major construction parties (MoUDHC, 2014).

In this study, the city governance of Addis Ababa 40-60 saving houses of construction project is the need of this research. In the city governance of Addis Ababa, there are thirteen (13) Addis Ababa 40-60 saving houses of construction project sites including two project lots (Bole-Bullbulla lot 1 and lot 2). Accordingly, there are nine (9) main central client branch offices which manage more than one lot and one project; and twelve (12) main consultants, which also consult more than one lot and project. However, to get more information about the subject matter of the study, all of the major construction parties are included from each lot even though some lots within a project and two projects are performed by similar parties (clients and consultants) as shown in the Table 3.2.

In view of that, 61 contractors (grade one), sixteen (16) consultants (all consultants), sixteen (16) total Addis Ababa 40-60 housing project branch offices including each lot and five (5) engineers from the regulatory body who conducted periodical site visit and interested in the Addis Ababa 40-60 saving houses of construction projects were selected. Hence, in this study, all the populations are selected and sampling is not incorporated since the researcher selected the whole group which is targeted in this study as shown in the Table 3.2 below.

A Study on Problems Affecting the Integration of Major Construction Parties in Design-Bid-Build Project Delivery Method in the Addis Ababa 40-60 Housing Construction Projects

Table 3. 2: Numbers of major construction parties in Addis Ababa 40-60 saving houses of construction projects

No.	Project Site Name	Addis Ababa 40-60 housing branches		Consultants		Contractors	Regulatory body	Total	
		Main central branches	Total number of branches	Main Number of consultants	Total number of consultants				
1	Senga Tera site	1	1	1	1	5	5	7	
2	Crown site	1	1	1	1	3		5	
3	Asko site	1	1	1	1	2		4	
5	Hinsta-Akrabi site	1	1	1	1	4		6	
5	Tourist-Nigid site	1	1	1	1	2		4	
6	Ehil-Negid site		1		1	3		5	
7	Bole-Bulbula site								
7.1	Bole-Bulbula lot 1	1	1	1	1	6		8	
7.2	Bole-Bulbula lot 2		1		1	4		6	
8	Bole Ayat site 1								
8.1	lot 1	1	1	1	1	1		3	
8.2	lot 2		1		1	4		6	
8.3	lot 4		1		1	5		7	
8.4	lot 3		1		1	1		3	5
9	Meri -Loke site		1		1	1		1	3

A Study on Problems Affecting the Integration of Major Construction Parties in Design-Bid-Build Project Delivery Method in the Addis Ababa 40-60 Housing Construction Projects

No.	Project Site Name	Addis Ababa 40-60 housing branches		Consultants		Contractors	Regulatory body	Total
		Main central branches	Total number of branches	Main Number of consultants	Total number of consultants			
10	Bole- Ayat site 2	1	1	1	1	6		8
11	Bole -sumit site		1	1	1	-		2
12	Bole-Behalf site	1	1	1	1	10		12
Total		9	16	12	16	61	5	98

3.5.1.1 Data collection

To avoid the constraints regarding direct access to construction companies participated in Addis Ababa 40-60 saving houses of construction project, questionnaires were actually delivered and collected by the researcher directly. Basically, the sample frame for this study are clients, consultants (in the list of consultants by MoUDC), contractors (grade one contractors registered in the list of grade one contractors by MoUDC) and regulatory body; which all these parties were participated in 40-60 housing project. Besides, these contractors and consultants were selected by the MoUDC to perform the 40-60 housing project and already delivering a project by entering a contract with client (i.e., the City governance of Addis Ababa 40-60 saving houses of construction projects).

3.5.1.2 Reliability tests

Any research based on measurement must be concerned with the reliability of measurement (Cronbach, 1951). Reliability is concerned with the ability of an instrument to measure consistently whether the test designer was correct in expecting a certain collection of items to yield interpretable statements about individual differences (Kelley, 1942), quoted in Cronbach (1951).

For this, Cronbach's Alpha (α) was developed by Lee Cronbach in 1951 to provide a measure of the internal consistency of a test or scale; it is expected to always fall between 0 and 1. This measure was originally developed in a context where a set of questions (also called items) are asked to a group of individuals with the objective of measuring a specific concept. Internal consistency is described as the extent to which all questions contribute positively towards measuring the same concept or construct and hence it is connected to the inter-relatedness of the items within the test (Cronbach, 1951).

Accordingly, Cronbach (1951) refers to the internal consistency as the proportion of the test variance that can be attributed to a group of items, which measures the reliability coefficient alpha:

$$\alpha = \frac{I}{I-1} \left(1 - \frac{\sum_{i=1}^I \sigma_i^2}{\sigma_x^2} \right) \dots\dots\dots [\text{Eq. 3.1}]$$

where $n = 1, 2 \dots I$ are the number of items in the scale, σ_i^2 is the variance of item I , and σ_x^2 is the variance of the observed total test scores. A high value of the Cronbach's alpha implies a higher internal consistency of the construct σ_x^2 . The higher the

coefficient, the stronger the linear relationship of the items is correlated and the higher the internal consistency (Gao and Low, 2014).

Thus, as Cronbach's alpha coefficient is the most widely used objective measure of reliability, the internal consistency of the scale of data reliability the data (data collected through questionnaire) was checked using this coefficient before the analysis in this research.

3.5.1.3 Data analysis

The relative importance index method used to determine the relative importance of the major integration problems among the major construction parties in Addis Ababa 40-60 saving houses of construction projects. This method was adopted in this study within major groups (clients, consultants, contractors & regulatory body). The four-point testing scale ranged as 1 (not at all a problem), 2 (minor problem), 3(moderate problem), 4(serious problem) were adopted and transformed to relative importance indices (RII) for each integration problem as follows:

$$RII = \sum W / A * N \dots\dots\dots [Eq. 3.2]$$

where W is the weighting given to each integration problems by the respondents (ranging from 1 to 4), A is the highest weight (i.e. 4 in this case), and N is the total number of respondents. The RII value had a range from 0 to 1 (0 not inclusive), higher the value RII, more important integration problem was the cause or effect. The RII was used to rank the different integration problems. These rankings made it possible to cross-compare the importance of the major integration problems as perceived by the four groups of respondents (i.e. clients, consultants, contractors and regulatory body).

3.5.2 Interviews

The design of the semi-structured interviews was based mainly on the research objectives, especially for the one concerning "What are the major integration problems among the major construction parties which affect the alignment and coordination among the major construction parties in Addis Ababa 40-60 saving houses of construction projects from design and planning to construction phase in DBB delivery method" to include integration problems which were not mentioned in the literature review and to include in the questionnaire. Prior to the interviews, their contents were tested with academic experts. Minor alterations were made as a result of this pre-test. Furthermore, during the fieldwork, the interviews were conducted

with a selected range of participants at the selected case study projects. These consisted of project managers, resident engineers, supervisors, site engineers, and foremen from the projects. This was the best opportunity to confirm the findings from questionnaire (phase-1) to identify the major integration problems which affect their collaborative working environment, and to what extent the problems affect at the project sites. The interviews focused on various aspects of major integration problems which affect the alignment of major construction parties in Addis Ababa 40-60 saving houses of construction projects. In summary, in each interview, the interviewees were asked a subset of the following questions:

1. What is the level of integration among the construction parties in 40-60 housing project?
2. What are the major integration problems among the major construction parties in your current 40-60 housing project?
3. What are the extent of these integration problems?
4. What you recommend to increase the alignment of major construction parties in 40-60 housing project?

In addition, the results of in-depth interviews with case study also helped to identify the gap between their current practice and the extent of major integration problems.

3.5.3 Case Study

3.5.3.1 Sampling Size Determination

For a given set of available resources, Shang and Low (2014) quoted in Voss *et al.* (2002), highlight that the greater the number of case studies, the greater the opportunities for in-depth observations. This is because, as they highlighted, two limitations exist with a single case: the first is the limit on the generalization of the conclusions drawn, and the other is the presence of biases, such as misjudging the level of representativeness of a single event or exaggerating the importance of easily available data. Furthermore, it can be anticipated that a single case study will not supply enough evidence to validate all the identified integration problems among the construction parties in the study. Multiple case studies look at several different construction projects, in order to reach more general conclusions than those provided in a single case. Besides, multiple case studies give modestly greater amount of comparative data. However, multiple cases may reduce the depth of the study when resources are constrained as Shang and low (2014) quoted Voss *et al.* (2002). In this study, the units of analysis chosen are three projects from 40-60 housing construction projects.

3.5.3.2 Selection of case study

Creswell (2003) wrote that a case for study needs to be (1) revelatory (when an investigator has an opportunity to observe and analyze a phenomena previously inaccessible to scientific investigation), (2) unique, and (3) critical to testing the theory. In addition, case study choices should provide opportunity to generalize the study (Shang and low, 2014). The selection of the case studies in this study observed the theoretical considerations and practical considerations. Hence, in this study the following three projects are selected among the overall thirteen (13) City governance of Addis Ababa 40-60 housing project, as described below:

Case study one (Senga Tera project): This choice was made partly because project is completed (it is better to get data from design to construction completion) and presented a convenient sample and were available. The purpose was to ensure the data gathered enable the sufficient generalizations of the findings from the whole construction process in DBB delivery method.

Case study two (Tourist project): This choice was made partly because the project is in the early construction stage and having more number of story (18 story) among the Addis Ababa 40-60 saving houses of construction projects and this project is an active. Moreover, it is accessible to the researcher to investigate more about the study from companies of different natures are covered.

Case study three (Bole Ayat one project): This choice was made partly because it is a biggest construction project consisting of a lot of building blocks and more number of parties involved in this project. Moreover, it also represents a diverse choice for the case studies, as companies of different natures are covered and provides an opportunity to generalize due to its complexity.

3.6 Summary of the research process

This chapter justifies and explains the research approaches and methods adopted in this research. Acknowledging the characteristics of the major research approaches and methods, mixed research is designed by incorporating both a qualitative and quantitative approach into a two-stage research process. A questionnaire survey, the most common method for collecting quantitative data from a sample, was conducted to allow overall importance index analysis method in this research.

The methodology adopted in this study includes literature review, questionnaire survey, and case study with in-depth interview. Firstly, literature review is undertaken to obtain an overall understanding of major integration problems among the major construction parties including the concepts about the level of integration using the dimension of team integration, integration of teams in different phases of construction project using the DBB delivery method. Secondly, once the quantitative and qualitative aspects of this study have been discussed, a two-phased research design is proposed. The questionnaire survey will be used to explore the major integration problems among the major construction parties. Cases studies with an in-depth interview will be used to answer the question of what and in what extent the major integration problems can affect major construction firms in Addis Ababa saving 40-60 houses of construction projects. Finally, the recommendations and conclusions will be forwarded based on the literature review and this research finding.

4. Survey Data Analysis: Result and Discussion

4.1 Introduction to survey data analysis

This chapter is structured according to research objective and presents the findings and results of the survey, which focuses on the major integration problems affecting the integration of major construction parties in the case of Addis Ababa 40-60 saving houses of construction projects. Accordingly, interpretation and discussions will be presented on the basis of the findings and limitations observed. The complete survey questions are provided in Appendix A.

4.1.1 Questionnaire response and quality of respondents

4.1.1.1 Questionnaire response rate

The study has focused on the major construction stakeholders participating in the governance of Addis Ababa 40-60 saving houses of construction projects. As the researcher explained the scope of this research, grade one contractors (among 153 sum of all category contractors), all consultants, all client project branch offices and regulatory body were considered for this study survey. The sum of this individual participant was 98 in all of the project sites as presented the Table 3.2. Accordingly, the total of 98 questionnaires were distributed: 16 were distributed for Employers, 16 for consultants, 61 for contractors and 5 for engineers working in the Ministry of Urban development and housing office (regulatory body) who have concern in the governance of Addis Ababa 40-60 saving houses of construction projects.

Out of the distributed 98 questionnaires, 69 professionals responded to the survey which were 13 (81.25%), 14 (87.50%), 39 (63.93%), 3(60%) from Employer, Consultants, Contractors, and regulatory body, respectively. This yields an overall response rate of 70.41%, which is found to be acceptable for the analysis of the data. The details of respondents' response by project site and the respondents' response rate by category are summarized in Table 4.1 and Table 4.2 respectively.

Table 4.1: The respondents' response in each project site based on survey data.

No	Project Site Name	Total number of respondents from clients	Total number of respondents from consultants	Total number of respondents from contractors	Regulatory body	Total respondents from all parties
1	Senga Tera site	1	1	3	3	5
2	Crown site	1	1	2		4
3	Asko site	-	1	2		3
4	Hinsta-Akrabi site	1	1	3		5
5	Tourist-Nigid site	1	-	2		3
6	Ehil-Negid site	1	1	2		4
7	Bole-Bulbula site					
7.1	Bole-Bulbula lot 1	-	1	4		5
7.2	Bole-Bulbula lot 2	1	1	3		5
8	Bole-Ayat site 1					
8.1	lot 1	1	1	1		13
8.2	lot 2	1	-	2		
8.3	lot 4	-	1	3		
8.4	lot 3	1	1	1		
9	Meri-Loke site	1	1	2	4	
10	Bole-Ayat site 2	1	1	3	5	
11	Bole-Sumit site	1	1	-	2	
12	Bole-Beshale site	1	1	6	8	
Total		13	14	39	3	69

Table 4.2: The respondents' response rate by parties' category based on survey data

Respondents category	Questionnaires			Overall percentage of each category's respondents from total returned
	Distributed	Total returned		
		In number	Percentage (%)	
Employers	16	13	81.25%	18.84%
Consultants	16	14	87.50%	20.29%
Contractors	61	39	63.93%	56.52%
Regulatory body	5	3	60.00%	4.35%
Total	98	69	70.41%	100.00%

From Table 4.2, it is evident that contractors (56.52%) make up the highest percentage of respondents followed by consultants (20.29%) and employers (18.84%). Ministry of urban development and housing (regulatory body) have the smallest respondents' makeup percentage (4.35%) compared to other respondents' category from an overall respondents make up perspective.

4.1.1.2 Quality of respondents

Professionals directly involved in the governance of Addis Ababa 40-60 saving houses of construction projects were considered for questionnaire survey. Out of 69 respondents, 50.72% of them have more than 10 years of experience in construction industry, whereas 36.23% of them had worked on building construction projects and Addis Ababa housing construction projects related works for over 10 years. This implied that the respondents have sufficient experience in the construction industry in general and in Addis Ababa housing projects and related works in particular and this enable them to provide better information about the subject matter of this study. Table 4.3 and Table 4.4 illustrate respondent experiences in construction industry, and in building construction projects and Addis Ababa housing construction related construction works, respectively.

Table 4.3: Experience of respondents in construction industry

Experience (yrs.)	Employers		Consultants		Contractors		Regulator		Total	
	No	%	No	%	No	%	No	%	No	%
< 5	3	23.08	2	14.29	6	15.38	0	0.00	11	15.94
5-10	5	38.46	4	28.57	12	30.77	2	66.67	23	33.33
>10	5	38.46	8	57.14	21	53.85	1	33.33	35	50.72
Total	13	100.00	14	100.00	39	100.00	3	100.00	69	100.00

Table 4.4: Experience of respondents in building construction projects and Addis Ababa saving houses of construction projects related works`

Experience (yrs.)	Employers		Consultants		Contractors		Regulator		Total	
	No	%	No	%	No	%	No	%	No	%
< 5	7	53.85	6	42.86	11	28.21	0	0.00	24	34.78
5-10	4	30.77	4	28.57	10	25.64	2	66.67	20	28.99
>10	2	15.38	4	28.57	18	46.15	1	33.33	25	36.23
Total	13	100.00	14	100.00	39	100.00	3	100.00	69	100.00

A higher percentage (53.85%) of professionals of employer have less than five years of experience in building construction projects and Addis Ababa saving houses of construction projects related works compared to contractors (28.24%) and consultants (42.86%). Furthermore, 65.22 % of professionals over all have more than five years' experience in building construction projects and Addis Ababa saving houses of construction projects related works. Thus, it is believed that the collected surveys are reflective of the prevailing situation in the construction industry with respect to the different construction parties' characteristics focused on parties' integration together with its implications. Therefore, the result obtained from the collected surveys is expected to have the wealth of knowledge and expert information that can help to draw reliable conclusions and recommendations.

Furthermore, the level of educational qualification and the position of respondents as well were considered for the questionnaire survey. Accordingly, 100% of them have bachelor degree and above in educational qualification and 63.77% of were senior positions holders

(project manager) who are currently working in Addis Ababa 40-60 saving houses of construction projects. Table 4.5 and Table 4.6 illustrated respondent highest educational qualification and their position who currently working in Addis Ababa 40-60 were saving houses of construction projects respectively.

Table 4.5: Highest level of respondents' education qualification

Education level	Employers		Consultants		Contractors		Regulator		Total	
	No	%	No	%	No	%	No	%	No	%
Diploma	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
BSc	9	69.23	11	78.57	32	82.05	2	66.67	54	78.26
MSc	4	30.77	3	21.43	7	17.95	1	33.33	15	21.74
Total	13	100.00	14	100.00	39	100.00	3	100.00	69	100.00

Table 4. 6: Position of the respondents

Education qualification	Employers		Consultants		Contractors		Regulator		Total	
	No	%	No	%	No	%	No	%	No	%
General (Deputy) manager	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Project Manager	9	69.23	8	57.14	27	69.23	0	0.00	44	63.77
Engineers	4	30.77	6	42.86	12	30.77	3	100.0	25	36.23
Total	13	100.0	14	100.00	39	100.00	3	100.0	69	100.00

A majority of the respondents were project managerial personnel working in the city of Addis Ababa housing construction projects (40-60 housing program). This included 44 project managers or resident engineers (63.77%) and 25 engineers (36.23 %). It is believed that respondents from these two groups have good understanding of construction works, and thus provide reliable answers to the survey data.

Moreover, the respondents' organizations years of establishment in which they are working are considered for this study. Accordingly, the Ministry of urban development and housing (regulatory body) has maximum percentage (100%) of years of establishment (more than 20 years) whereas as the employer (100%) has less than 5 years of establishment (four years

since its establishment). Most of the respondents are also from consultants' and contractors' organization of more than 10 years of establishment as illustrated in Table 4.7 below. Accordingly, this enable them to respond based on the organizations' long period of experience they learnt from about the subject matter of this study.

Table 4.7: Organization's experience and year of establishment

Experience (yrs.)	Employers		Consultants		Contractors		Regulatory body		Total	
	No	%	No	%	No	%	No	%	-	%
< 5	13	100.0	0	0.00	1	2.56	0	0.00	14	20.29
5-10	0	0.00	7	50.00	19	48.72	0	0.00	26	37.68
10-15	0	0.00	5	35.71	10	25.64	0	0.00	15	21.74
15-20	0	0.00	2	14.29	9	23.08	0	0.00	11	15.94
>20	0	0.00	0	0.00	0	0.00	3	100.00	3	4.35
Total	13	100.0	14	100.00	39	100.00	3	100.00	69	100.0

Table 4. 8: Organization's area of specialization in the construction industry

Experience (yrs.)	Employers		Consultants		Contractors		Regulator		Total	
	No	%	No	%	No	%	No	%	No	%
Building	13	100.0	14	100.00	32	82.05	3	100.00	62	85.25
General	0	0.00	0	0.00	7	17.95	0	0.00	7	14.75
Total	13	100.0	14	100.00	39	100.00	3	100.00	69	100

With respect to the respondents' firm specialization as shown in the Table4.8, out of 69 organizations, 62 (85.25%) of the responding firms' specialize in building construction, whereas only 9 (14.75%) of the organizations have worked on general construction sector. From this survey data, it is expected that more accurate data and information was obtained since these majority parties are experienced with the building construction projects.

4.1.2 General projects' information

As mentioned before in section (3.5.1), there are a total of nine (9) main central branches which consists of 12 housing construction project sites. Among these sites, Bole-Bbulbulla site has two lots while Bole-Ayat site 1 has four lots. Accordingly, the client recognized and

reported that there are 13 housing construction projects after considering 'Bole-Bulbulla lot 1' and 'Bole-Bulbulla lot 2' as independent sites. Hence, in this study, the researcher categorized Bole-Bulbulla lot 1 as 'Bole-Bulbulla site 1' and Bole-Bulbulla lot 2 as 'Bole-Bulbulla site 2' since their progress status (% completed) is significantly different between these two lots. However, in this study, the lots in Bole-Ayat site 1 are analyzed and considered under Bole-Ayat site 1. Therefore, there are a total of thirteen (13) housing construction projects included in this study. Their project name, contract completion time, and progress status (% completed) is presented in the Table 4.9 below.

Table 4.9: Projects' information: contract completion time and progress status (on May 2016)

Projects	Delivery method	Contract time (months)	%completed
Senga-Tera	DBB	18	95.7
Crown	DBB	15	94.6
Asko	DBB	18	83.7
Hinsta-Akrabi	DBB	18	49.3
Tourist-Negid	DBB	19	20.1
Ehil-Negid	DBB	18	76.2
Bole-Bulbulla 1	DBB	18	75.6
Bole-Bulbulla 2	DBB	18	15.9
Bole-Ayat 1	DBB	15	70.1
Meri-Loke	DBB	18	44.3
Bole-Ayat 2	DBB	18	16
Bole-Sumit	DBB	13	11.6
Bole-Beshale	DBB	18	14.9

Majority of the city governance of Addis Ababa 40-60 saving houses of construction projects have percentage of completion more than 50% as shown in the Table 4.9. Besides, from the questionnaire survey, it is understood that all 13 (thirteen) city governance of Addis Ababa saving houses of construction projects used non-competitive traditional (DBB) contractual application procedure. This is because the process is only used since it is sequential process and the project cost is not offered in competitive basis instead it is fixed price. Moreover, the

agreed price is more close to labor contract due the nature of supplying of major material (cement, rebar, precast and hollow and ribbed block) by the client.

4.1.3 General awareness of integration issues and opinion of respondents

Almost all (96.97%) of the respondents from the survey data were aware of integration issues where as very few (3.03%) were not aware of integration issues. Table 4.10 shows the responses of the respondents with regard to their awareness of integration issues among the construction parties in the governance of Addis Ababa saving houses of construction projects (40-60 housing program). This indicated that most of the respondents understand the concepts of integration and it is evident that they provided better information for the case of Addis Ababa 40-60 saving houses of construction projects regarding the subject matter of this study.

Table 4. 10: Respondents rate for awareness of integration issues

Respondents awareness to Integration issue	Number of respondents	Percentage (%)
Yes	64	96.97
No	2	3.03
Total	66	100.00

From the questionnaire survey, 91.30% of the respondents strongly disagree and the remaining 8.70% of the respondent disagree that there is an integration among the major participating parties in the housing construction projects. This shows that all of the parties involved in projects are aware about the concept of integration issues among the construction parties and according to their perception; they all agree that there is an integration problem among the major construction parties. The following questions first focused on identifying the extent of major parties' integration and then studied the major integration problems which cause disintegration among these major construction parties, and provided the practical areas and lessons for future 40-60 saving houses of construction projects and related works.

Table 4. 11: Respondents' perception about integration of major construction parties in 40-60 housing projects.

Perception of integration	Number of respondents	Percentage (%)
Strongly agree	0	0.00
Agree	0	0.00
Disagree	6	8.70
Strongly disagree	63	91.30
Total	69	100.00

4.1.4 Level of major construction parties' integration for the case of city governance of Addis Ababa 40-60 saving houses of construction projects

For the case of Addis Ababa housing construction project (40-60 housing program), the level of integration among the major construction parties has been established for each of 13 projects. For this, the researcher compared and contrasted the studied 13 projects, and ranked them for each of the 10 dimensions of team integration based on the survey data. The 10 dimensions of team integration included: single team focus and objective, seamless operation with no organizational defined boundaries, mutually beneficial outcome, increased time and cost predictability, unrestricted cross-sharing of information, team flexibility and responsiveness to change, creation of single and co-located team, equal opportunity for project inputs, equitable team relationships and respect for all, and No blame culture.

Accordingly, the researcher analyzed the extent of major parties' integration for each of thirteen (13) projects using percentage of response for all three level of integration, i.e., % response for full Achievement (FR), % response for Partial Achievement (PR), and % response for Not Achieved (NR), using an excel analysis sheet. Then, the three levels were combined into one measure (Level of Achievement) using a weighted average approach. Table 4.13 shows the extent of major parties' integration for each of thirteen (13) projects using percentage of response for all three level of integration.

Moreover, the Level of Achievement (LoA) of each dimension of team integration for each city governance of Addis Ababa 40-60 saving houses of construction project was introduced using the weighted average approach. For the weighted average approach calculation, the

percentages of response for each level of integration were assigned the following values: FR carries 2 points, PR carries 1 point, and NR carries - 2 points. Since there is no rating scale called 'partially not achieved', it was not included in the analysis and therefore assigned the value of '-2' for 'not achieved' which is totally opposite to fully achieved; hence, the maximum value will be either 2 or -2 associated with either full achievement or not achieved respectively. Based on the percentage of response for all three level of integration, the Level of achievement (LoA) for each dimension of team integration is calculated using Equation 4.1:

$$\text{LoA} = ((2*FR + 1*PR - 2*NR)/2) * 100 \dots\dots\dots [\text{Eq. 4.1}]$$

The nominator value shown in Equation 4.1 is divided by 2 to convert the percentage measurement to 100 since the percentage measurement shall be from reference 100.

Finally, after calculating the LoA of each dimension of team integration for each city governance of Addis Ababa 40-60 saving houses of construction projects, the researcher took the average value of each LoA so as to get the Project Level of Achievement (PrLoA) for each project as presented in Table 4.12, 4.13, and 4.14.

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Table 4. 12: The extent of major parties integration for Senga-Tera, Crown, Ehil-Negid and Asko 40-60 saving houses of construction projects

		Level of construction parties' integration in the city governance of Addis Ababa 40-60 saving houses of construction projects																							
		Senga-Tera					Crown					Ehil-Negid					Asko								
		Respondent response rate	full	partial	no	Total	LoA	full	partial	no	Total	LoA	full	partial	no	Total	LoA	full	partial	no	Total	LoA			
Dimensions of team integration	1	Single team focus and objective	respondent number	3.0	2.0	-	5.0	80.0	1.0	3.0	-	4.0	62.5	2.0	2.0	-	4.0	75.0	1.0	2.0	-	3.0	66.7		
			percentage (%)	60.0	40.0	-	100.0		25.0	75.0	-	100.0		50.0	50.0	-	100.0		33.3	66.7	-	100.0			
			respondent number	2.0	3.0	-	5.0		2.0	2.0	-	4.0		1.0	3.0	-	4.0		1.0	1.0	1.0	3.0			
			percentage (%)	40.0	60.0	-	100.0	70.0	50.0	50.0	-	100.0	75.0	25.0	75.0	-	100.0	62.5	33.3	33.3	33.3	100.0	16.7		
	3	Mutually beneficial outcome	respondent number	1.0	3.0	1.0	5.0	30.0	1.0	2.0	1.0	4.0	25.0	1.0	2.0	1.0	4.0	25.0	1.0	2.0	-	3.0	66.7		
			percentage (%)	20.0	60.0	20.0	100.0		25.0	50.0	25.0	100.0		25.0	50.0	25.0	100.0		33.3	66.7	-	100.0			
	4	Increased time and cost predictability	respondent number	1.0	4.0	-	5.0	60.0	1.0	2.0	1.0	4.0	25.0	1.0	2.0	1.0	4.0	25.0	-	2.0	1.0	3.0	0.0		
			percentage %	20.0	80.0	-	100.0		25.0	50.0	25.0	100.0		25.0	50.0	25.0	100.0		-	66.7	33.3	100.0			
	5	Unrestricted cross-sharing of information	respondent number	2.0	3.0	-	5.0	70.0	2.0	2.0	-	4.0	75.0	2.0	2.0	-	4.0	75.0	1.0	2.0	-	3.0	66.7		
			percentage %	40.0	60.0	-	100.0		50.0	50.0	-	100.0		50.0	50.0	-	100.0		33.3	66.7	-	100.0			
6	Team flexibility and responsiveness to change	respondent number	1.0	2.0	2.0	5.0	0.0	-	3.0	1.0	4.0	12.5	2.0	2.0	-	4.0	75.0	1.0	1.0	1.0	3.0	16.7			
		percentage (%)	20.0	40.0	40.0	100.0		-	75.0	25.0	100.0		50.0	50.0	-	100.0		33.3	33.3	33.3	100.0				
7	Creation of single and co-located team	respondent number	-	3.0	2.0	5.0	-10.0	-	2.0	2.0	4.0	-25.0	-	2.0	2.0	4.0	-25.0	-	2.0	1.0	3.0	0.0			
		percentage %	-	60.0	40.0	100.0		-	50.0	50.0	100.0		-	50.0	50.0	100.0		-	66.7	33.3	100.0				
8	Equal opportunity for project inputs	respondent number	1.0	3.0	1.0	5.0	30.0	1.0	1.0	2.0	4.0	-12.5	1.0	2.0	1.0	4.0	25.0	1.0	2.0	-	3.0	66.7			
		percentage (%)	20.0	60.0	20.0	100.0		25.0	25.0	50.0	100.0		25.0	50.0	25.0	100.0		33.3	66.7	-	100.0				
9	Equitable team relationships and respect for all	respondent number	1.0	3.0	1.0	5.0	30.0	1.0	2.0	1.0	4.0	25.0	-	3.0	1.0	4.0	12.5	-	2.0	1.0	3.0	0.0			
		percentage (%)	20.0	60.0	20.0	100.0		25.0	50.0	25.0	100.0		-	75.0	25.0	100.0		-	66.7	33.3	100.0				
10	No blame culture	respondent number	1.0	3.0	1.0	5.0	30.0	1.0	3.0	-	4.0	62.5	1.0	2.0	1.0	4.0	25.0	1.0	1.0	1.0	3.0	16.7			
		percentage (%)	20.0	60.0	20.0	100.0		25.0	75.0	-	100.0		25.0	50.0	25.0	100.0		33.3	33.3	33.3	100.0				
Each Project Level of Achievement (PLoA) (average LoA) of team integration							39.00						32.50						37.50						31.67
Rank of projects based on Project Level of Achievement (PLoA) of team integration							3.0						7.0						4.0						8.0

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Table 4. 13: The extent of major parties integration for HintsA-Akrabi, Tourist, Bole-Bulbulla 1, Bole-Bulbulla 2 and Meri-Loke housing construction projects

		Level of construction parties' integration in the city governance of Addis Ababa 40-60 saving houses of construction projects																														
		HinstA-krabi					Tourist					Bole-Bulbulla 1					Bole-Bulbulla 2					Meri-Loke										
		Respondent response rate	full	partia l	no	Total	LoA	full	partial	no	Total	LoA	full	partial	no	Total	LoA	full	partia l	no	Total	LoA	full	partial	no	Total	LoA					
Dimensions of team integration	1	Single team focus and objective	respondent number	3.0	2.0	-	5.0	80.0	-	3.0	-	3.0	50.0	2.0	3.0	-	5.0	70.0	1.0	4.0	-	5.0	60.0	2.0	2.0	-	4.0	75.0				
			percentage (%)	60.0	40.0	-	100.0		-	100.0	-	100.0		40.0	60.0	-	100.0		20.0	80.0	-	100.0		50.0	50.0	-	100.0					
			respondent number	2.0	3.0	-	5.0		1.0	2.0	-	3.0		2.0	2.0	1.0	5.0		2.0	3.0	-	5.0		1.0	2.0	1.0	4.0					
			percentage (%)	40.0	60.0	-	100.0	70.0	33.3	66.7	-	100.0	66.7	40.0	40.0	20.0	100.0	40.0	40.0	60.0	-	100.0	70.0	25.0	50.0	25.0	100.0	25.0				
	3	Mutually beneficial outcome	respondent number	2.0	2.0	1.0	5.0	40.0	-	3.0	-	3.0	50.0	2.0	3.0	-	5.0	70.0	3.0	2.0	-	5.0	80.0	1.0	3.0	-	4.0	62.5				
			percentage (%)	40.0	40.0	20.0	100.0		-	100.0	-	100.0		40.0	60.0	-	100.0		60.0	40.0	-	100.0		25.0	75.0	-	100.0					
	4	Increased time and cost predictability	respondent number	-	4.0	1.0	5.0	20.0	1.0	1.0	1.0	3.0	16.7	1.0	2.0	2.0	5.0	0.0	1.0	3.0	1.0	5.0	30.0	-	2.0	2.0	4.0	-25.0				
			percentage %	-	80.0	20.0	100.0		33.3	33.3	33.3	100.0		20.0	40.0	40.0	100.0		20.0	60.0	20.0	100.0		-	50.0	50.0	100.0					
	5	Unrestricted cross-sharing of information	respondent number	2.0	2.0	1.0	5.0	40.0	2.0	1.0	-	3.0	83.3	1.0	4.0	-	5.0	60.0	2.0	2.0	1.0	5.0	40.0	1.0	2.0	1.0	4.0	25.0				
			percentage %	40.0	40.0	20.0	100.0		66.7	33.3	-	100.0		20.0	80.0	-	100.0		40.0	40.0	20.0	100.0		25.0	50.0	25.0	100.0					
6	Team flexibility and responsiveness to change	respondent number	2.0	1.0	2.0	5.0	10.0	1.0	2.0	-	3.0	66.7	2.0	2.0	1.0	5.0	40.0	1.0	2.0	2.0	5.0	0.0	-	2.0	2.0	4.0	-25.0					
		percentage (%)	40.0	20.0	40.0	100.0		33.3	66.7	-	100.0		40.0	40.0	20.0	100.0		20.0	40.0	40.0	100.0		-	50.0	50.0	100.0						
7	Creation of single and co-located team	respondent number	-	3.0	2.0	5.0	-10.0	-	2.0	1.0	3.0	0.0	-	3.0	2.0	5.0	-10.0	-	3.0	2.0	5.0	-10.0	-	2.0	2.0	4.0	-25.0					
		percentage %	-	60.0	40.0	100.0		-	66.7	33.3	100.0		-	60.0	40.0	100.0		-	60.0	40.0	100.0		-	50.0	50.0	100.0						
8	Equal opportunity for project inputs	respondent number	-	3.0	2.0	5.0	-10.0	1.0	2.0	-	3.0	66.7	1.0	2.0	2.0	5.0	0.0	1.0	2.0	2.0	5.0	0.0	1.0	2.0	1.0	4.0	25.0					
		percentage (%)	-	60.0	40.0	100.0		33.3	66.7	-	100.0		20.0	40.0	40.0	100.0		20.0	40.0	40.0	100.0		25.0	50.0	25.0	100.0						
9	Equitable team relationships and respect for all	respondent number	-	3.0	2.0	5.0	-10.0	1.0	2.0	-	3.0	66.7	2.0	2.0	1.0	5.0	40.0	1.0	3.0	1.0	5.0	30.0	1.0	3.0	-	4.0	62.5					
		percentage (%)	-	60.0	40.0	100.0		33.3	66.7	-	100.0		40.0	40.0	20.0	100.0		20.0	60.0	20.0	100.0		25.0	75.0	-	100.0						
10	No blame culture	respondent number	1.0	2.0	2.0	5.0	0.0	1.0	2.0	-	3.0	66.7	2.0	2.0	1.0	5.0	40.0	1.0	3.0	1.0	5.0	30.0	-	3.0	1.0	4.0	12.5					
		percentage (%)	20.0	40.0	40.0	100.0		33.3	66.7	-	100.0		40.0	40.0	20.0	100.0		20.0	60.0	20.0	100.0		-	75.0	25.0	100.0						
Each Project Level of Achievement (PLoA) (average LoA) of team integration								23.00						53.33						35.00						33.00						21.25
Rank of projects based on Project Level of Achievement (PLoA) of team integration								11.0						1.0						5.0						6.0						12.0

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Table 4. 14: The extent of major parties integration for Bole-Ayat 1, Bole-Summit, Bole-Beshale and Bole-Ayat 2 housing construction projects

		Level of construction parties' integration in the city governance of Addis Ababa 40-60 saving houses of construction projects																						
		Bole-Ayat 1					Bole-summit					Bole-Beshale					Bole-Ayat 2							
		Respondent response rate	full	partia l	no	Total	LoA	full	partial	no	Total	LoA	full	partial	no	Total	LoA	full	partia l	no	Total	LoA		
Dimensions of team integration	1	Single team focus and objective	respondent number	5.0	8.0	-	13.0	69.2	1.0	1.0	-	2.0	75.0	5.0	3.0	-	8.0	81.3	2.0	3.0	-	5.0	70.0	
			percentage (%)	38.5	61.5	-	100.0		50.0	50.0	-	100.0		62.5	37.5	-	100.0		40.0	60.0	-	100.0		
			respondent number	4.0	9.0	-	13.0		1.0	1.0	-	2.0		2.0	6.0	-	8.0		2.0	3.0	-	5.0		
			percentage (%)	30.8	69.2	-	100.0	65.4	50.0	50.0	-	100.0	75.0	25.0	75.0	-	100.0	62.5	40.0	60.0	-	100.0	70.0	
	3	Mutually beneficial outcome	respondent number	2.0	9.0	2.0	13.0	34.6	1.0	1.0	-	2.0	75.0	2.0	6.0	-	8.0	62.5	2.0	2.0	1.0	5.0	40.0	
			percentage (%)	15.4	69.2	15.4	100.0		50.0	50.0	-	100.0		25.0	75.0	-	100.0		40.0	40.0	20.0	100.0		
	4	Increased time and cost predictability	respondent number	-	9.0	4.0	13.0	3.8	-	1.0	1.0	2.0	-25.0	-	5.0	3.0	8.0	-6.3	1.0	3.0	1.0	5.0	30.0	
			percentage (%)	-	69.2	30.8	100.0		-	50.0	50.0	100.0		-	62.5	37.5	100.0		20.0	60.0	20.0	100.0		
	5	Unrestricted cross-sharing of information	respondent number	4.0	7.0	2.0	13.0	42.3	-	2.0	-	2.0	50.0	2.0	5.0	1.0	8.0	43.8	2.0	2.0	1.0	5.0	40.0	
			percentage (%)	30.8	53.8	15.4	100.0		-	100.0	-	100.0		25.0	62.5	12.5	100.0		40.0	40.0	20.0	100.0		
6	Team flexibility and responsiveness to change	respondent number	2.0	7.0	4.0	13.0	11.5	-	2.0	-	2.0	50.0	2.0	2.0	4.0	8.0	-12.5	1.0	2.0	2.0	5.0	0.0		
		percentage (%)	15.4	53.8	30.8	100.0		-	100.0	-	100.0		25.0	25.0	50.0	100.0		20.0	40.0	40.0	100.0			
7	Creation of single and co-located team	respondent number	-	6.0	7.0	13.0	-30.8	-	1.0	1.0	2.0	-25.0	-	5.0	3.0	8.0	-6.3	-	3.0	2.0	5.0	-10.0		
		percentage (%)	-	46.2	53.8	100.0		-	50.0	50.0	100.0		-	62.5	37.5	100.0		-	60.0	40.0	100.0			
8	Equal opportunity for project inputs	respondent number	2.0	6.0	5.0	13.0	0.0	-	2.0	-	2.0	50.0	1.0	5.0	2.0	8.0	18.8	1.0	3.0	1.0	5.0	30.0		
		percentage (%)	15.4	46.2	38.5	100.0		-	100.0	-	100.0		12.5	62.5	25.0	100.0		20.0	60.0	20.0	100.0			
9	Equitable team relationships and respect for all	respondent number	1.0	6.0	6.0	13.0	-15.4	1.0	1.0	-	2.0	75.0	2.0	4.0	2.0	8.0	25.0	1.0	2.0	2.0	5.0	0.0		
		percentage (%)	7.7	46.2	46.2	100.0		50.0	50.0	-	100.0		25.0	50.0	25.0	100.0		20.0	40.0	40.0	100.0			
10	No blame culture	respondent number	2.0	6.0	5.0	13.0	0.0	-	2.0	-	2.0	50.0	1.0	6.0	1.0	8.0	37.5	2.0	2.0	1.0	5.0	40.0		
		percentage (%)	15.4	46.2	38.5	100.0		-	100.0	-	100.0		12.5	75.0	12.5	100.0		40.0	40.0	20.0	100.0			
Each Project Level of Achievement (PLoA) (average LoA) of team integration							18.08					45.00					30.63					31.00		
Rank of projects based on Project Level of Achievement (PLoA) of team integration							13.0					2.0					10.0					9.0		

Note: The PrLoA is obtained using an average value of LoA of dimensions of team integration.

Based on the survey data, it is shown that the extent of major construction parties' integration among the major construction parties is very minimal as shown in the analysis Table 4.12, 4.13, and 4.14 for all of the 13 governance of Addis Ababa 40-60 saving houses construction projects.

Accordingly, single team focus and objective was achieved in good manner (81.30%) in Bole-Beshale project site followed by Senga-Tera and Hints-Akrabi project site (80%) whereas the extent of team integration in Tourist is relatively low (50%) from perspective of single team focus and objective (one of the dimensions of extent of team integration) from the survey data as shown in the Figure 4.2. However, Ehil-Negid, Meri-Loke and Bole-Summit project site achieved 75% level of integration in terms of single team focus and objective.

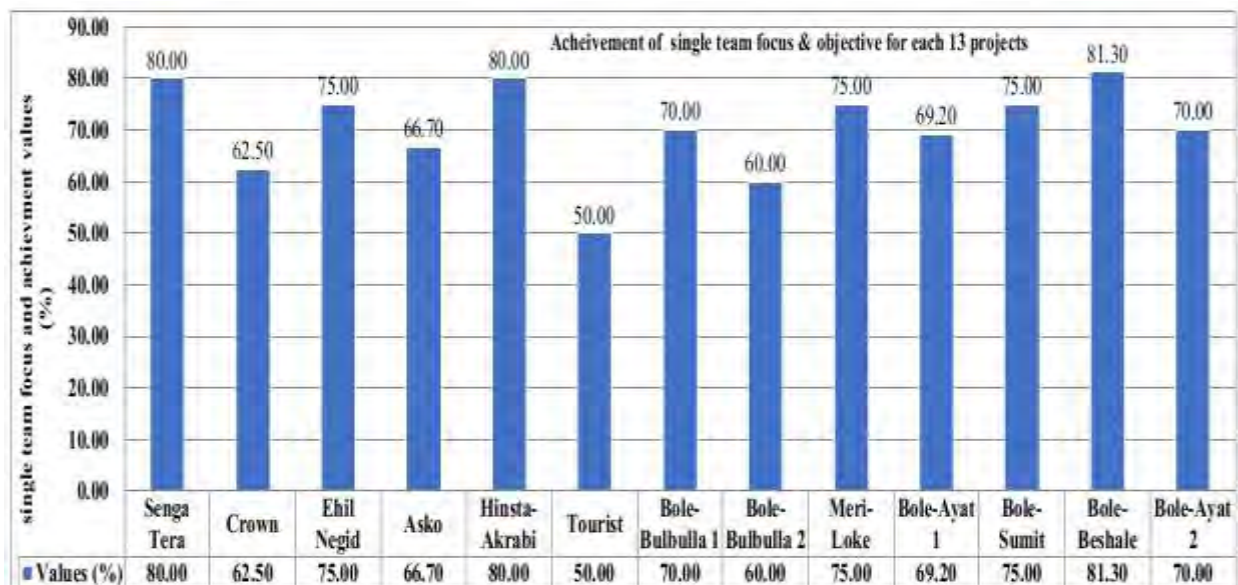


Figure 4. 1: Achievement of single team focus & objective for each projects.

In addition, in most of the project sites, the level of integration from the unrestricted sharing of information is better achieved compared to other dimensions of team integration. As Figure 4.3 indicated the respondents' response, Tourist project site achieved 83.3% (highest achievement) of level of integration followed by the Crown and Ehil-Negid (75%) even though it was poorly achieved in Meri-Loke (25%). This implied that parties who achieved unrestricted sharing of information but were not able to form a new single team and remained as individual sub-teams within their work places but co-located with others. For instance,

Tourist project teams achieved a degree of sharing unrestricted information but were not able to form a new single team although they operated with different office location.

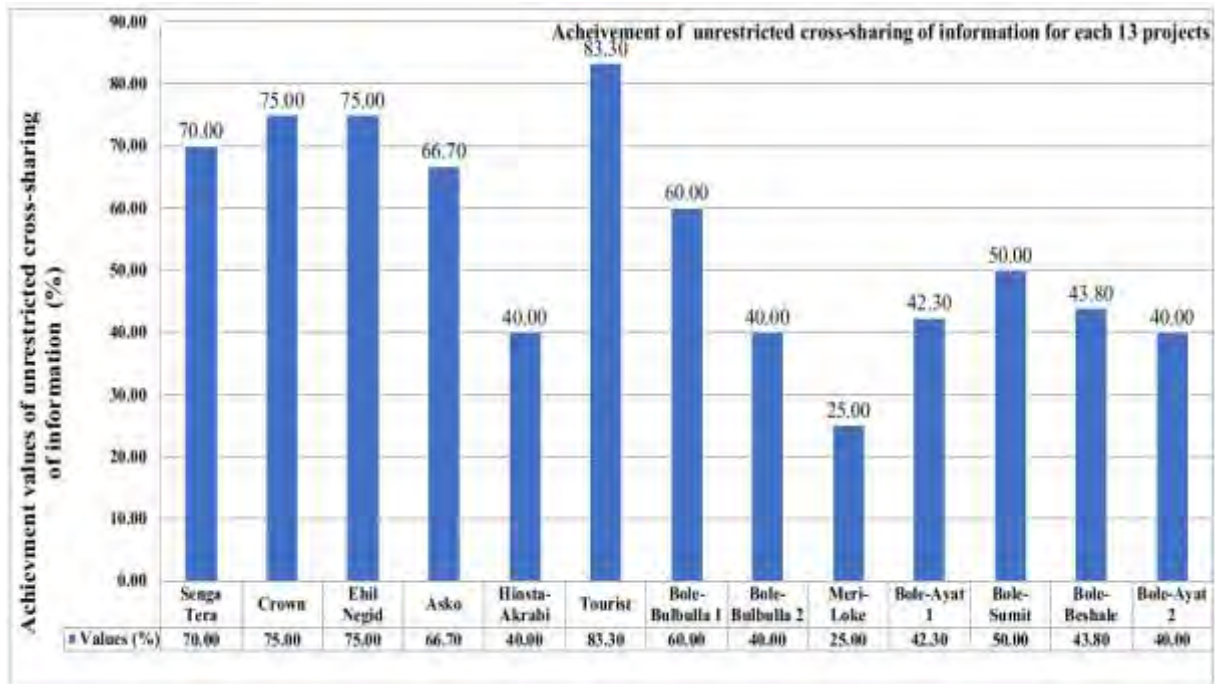


Figure 4. 2: Achievement of unrestricted sharing of information for each projects.

In the other hand, as shown in Figure 4.4, Seamless operation with no organizational defined boundaries was achieved (75%) better at Crown and Bole-Sumit whereas it was low achieved at Meri-Loke (25%) and Ask (16.70%) projects compared to other housing construction project. This is indicative of that some projects teams (Crown, Bole-Sumit and Hinsta-Akrabi) struggling to overcome cultural attitudes and various teams made significant efforts at collaborating with each other and some project teams (Asko, Meri-Loke and Bole-Bulbulla1) were unable to operate seamlessly and members continued to work disjointedly within their individual organisations. The remainders were able to operate at moderate level as shown in the Figure 4.4.

In all the 13 governance of Addis Ababa saving houses of construction projects (40-60 housing program), the survey data indicated that seamless operation with no organizational defined boundaries operation is achieved in good manner which has a closer achievement with single team focus and objective among the major construction parties in most of 40-60 construction projects. Bole-Ayat 2, Bole-Bulbulla 2, Senga-Tera and Hinsta-Akrabi project sites achieved maximum (70%) level of integration next to Bole-sumit and Crown (75%). However, Asko and Meri-Loke 40-60 housing projects have 16.70% and 25% level of

achievement in terms of seamless operation with no organizational defined boundaries respectively whereas Ehil-Negid and Bole-Beshale project sites have 62.50% level of achievement.

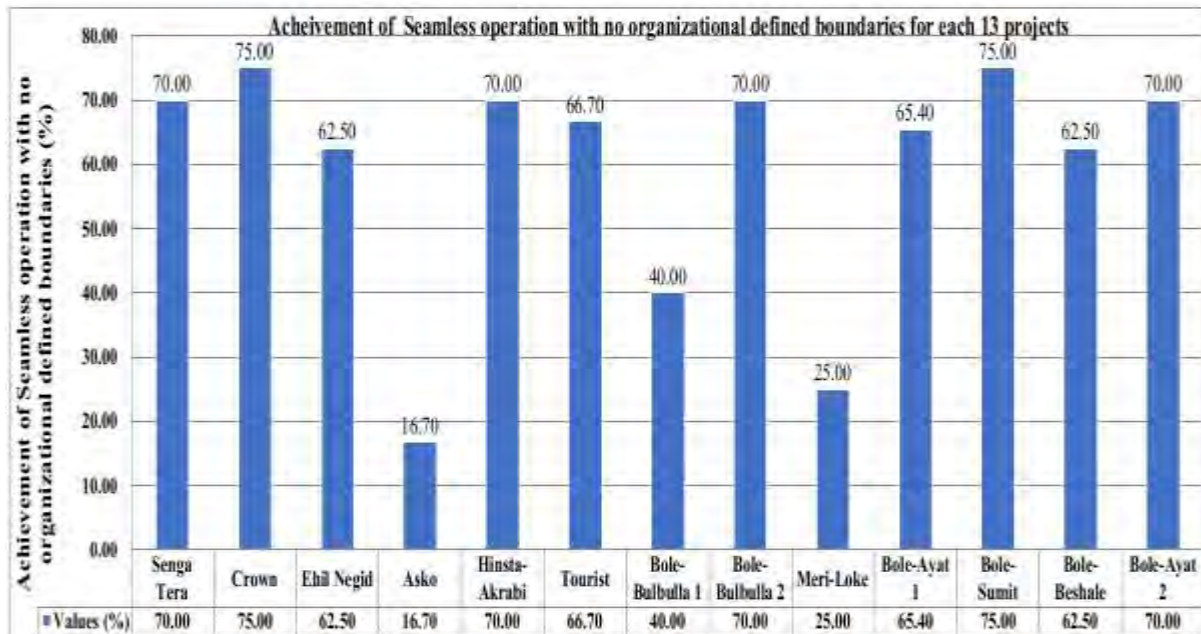


Figure 4. 3: Achievement of Seamless operation with no organizational defined boundaries for projects.

According to the respondents, mutually beneficial outcome dimension of team integration is practiced in better way among the major construction parties in Bole-Bulbulla 2 (80%), Bole-Summit (75%) and Bole-Bulbulla 1(70%) project sites. On the other hand, Crown and Ehil-Negid achieved low (25%) level of achievement even though Seamless operation with no organizational defined boundaries was achieved better in these sites. According to the respondents, Bole-Bulbulla 2 and Bole-Sumit project teams agreed that they were struggling to work for their mutual benefits in addition to their Seamless operation with no organizational defined boundaries as a single team.

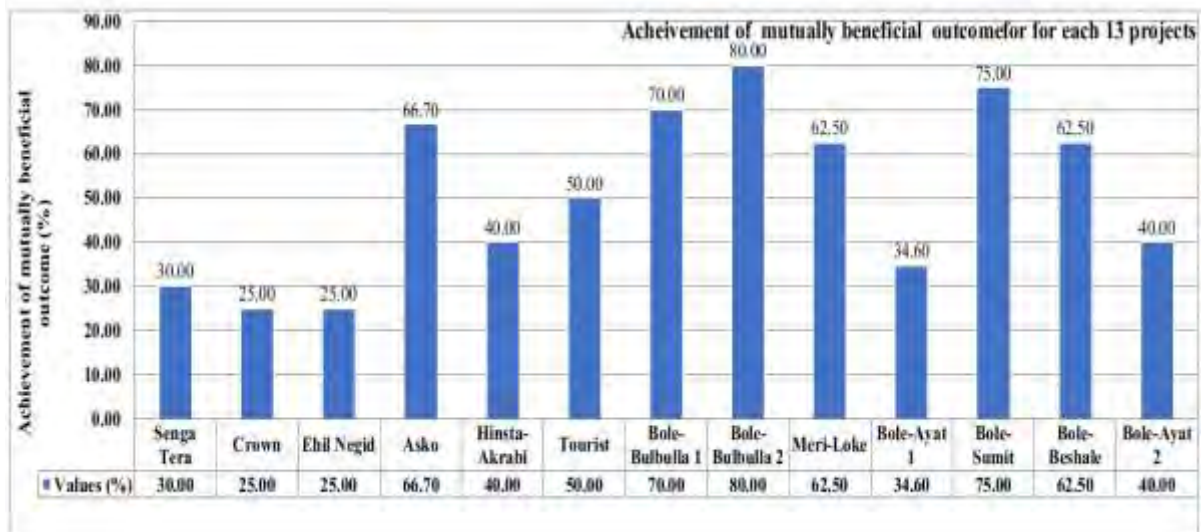


Figure 4. 4: Achievement of mutual benefit outcome for each projects.

According to the respondents' opinion, as shown in figure 4.6, only some project teams achieved team flexibility. As it is indicated in the Table 4.13, Tourist project site achieved (66.70 %) next to Ehil-Negid (75%) followed by Bole-summit (50%) followed by Bole-summit (50%). However, the remainder project teams were unable to achieve the team flexibility as shown in the Figure 4.6 and Meri-Loke and Bole-Beshale sites had the lowest level of achievement. This implied that project personnel were not freely requested to join the project teams as they were required and no personnel leave as even though the services of these personnel were not required in most of the project sites (Baiden et al., 2006).

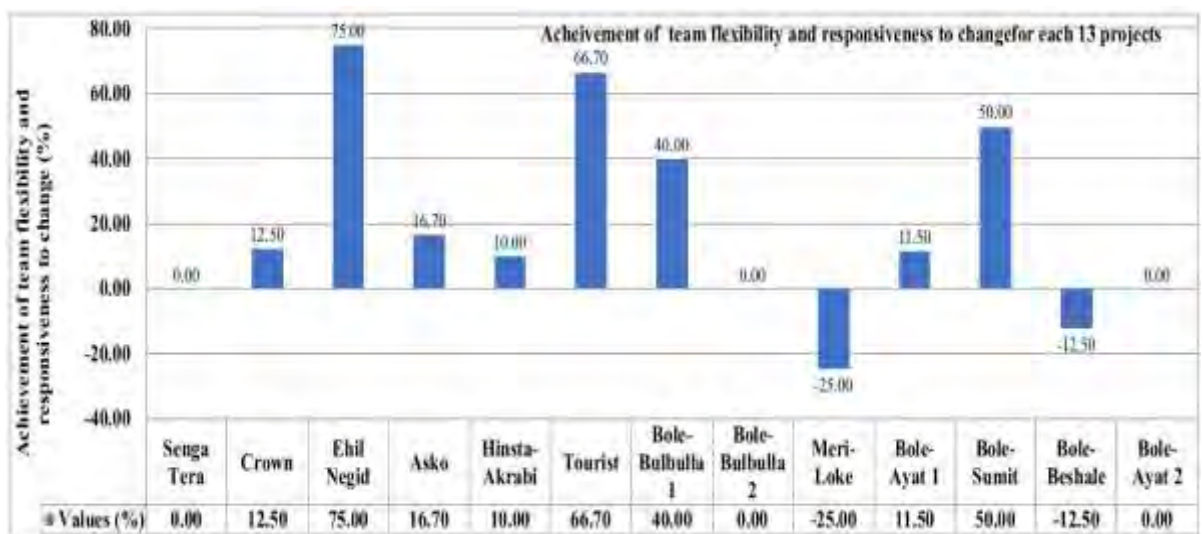


Figure 4.5: Achievement of team flexibility and responsiveness to change for each projects.

Among the 10 dimensions of team integration, as shown in Figure 4.7, the predictability of time and cost is poorly practiced next to creation of single and co-located team dimension in almost all of project sites except the Senga-Tera (60%) which is the maximum level of achievement followed by Bole-Bulbulla 2 and Bole-Ayat 2 (30% level of achievement), and Crown and Ehil-Negid (25% level of achievement), respectively. In the opposite hand, Meri-Loke and Bole-Sumit achieved least (-25.3%) level of integration to predict the cost and time of project parameters. This is an indicative of most of the project teams consequently had not an improved ability to predict time and cost estimates more accurately if restricted and absence of transparent system with easy access to information was not achieved among the major construction parties. Subsequently, most of the projects (Senga-Tera, Crown, Asko, Ehil-Negid and Hinsta-Akrabi) were not completed within the expected time and cost limits, which is consistent with previous findings (Wubshet, 2004; and Baiden et al. 2006).

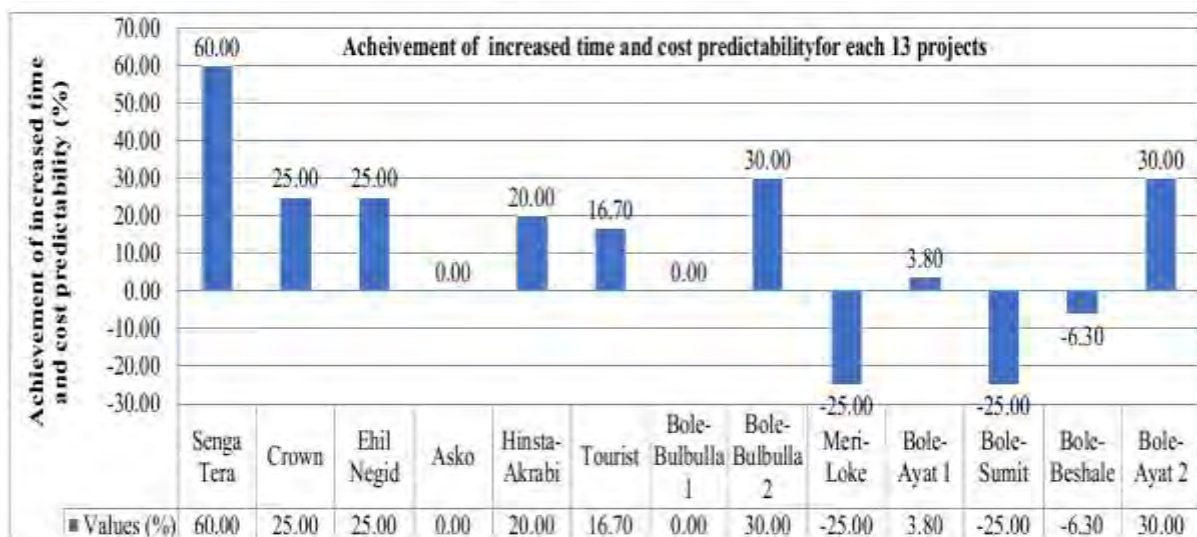


Figure 4.6: Achievement of increased time and cost predictability for each projects

As shown in Figure 4.8, the seventh dimension of team integration (creation of single and co-located team) is the most poorly achieved among major construction parties in all of 40-60 construction projects as the respondents' response indicated in the Table 4.12, 4.13 and 4.14. From these tables, it is shown that the level of achievement of creation of single and co-located team in Addis Ababa 40-60 saving houses of construction projects is below 0.0% in all project teams except for Asko and Tourist project sites (0.0%). Among the 13 project sites, this dimension of team integration is least achieved in Bole Ayat 1 project (-30.8%)

followed by Meri-Loke, Crown, Bole-Sumit and Ehil-Negid which all have (-25%) of level of achievement.

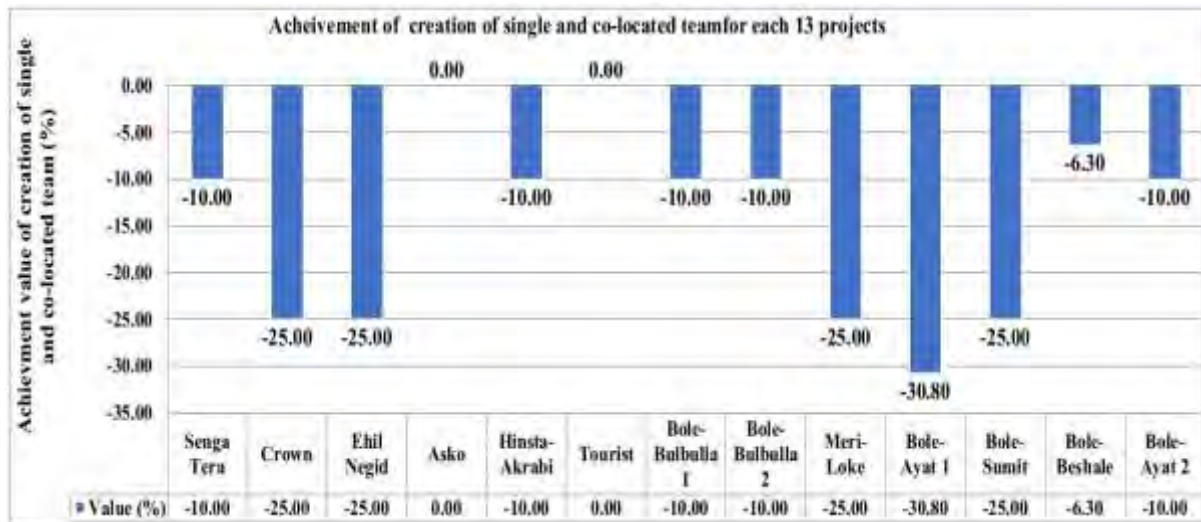


Figure 4.7: Achievement of creation of single and co-located team for each projects.

Moreover, from the survey data, the level of achievement of equal opportunity for project inputs is not practically good among the major construction parties through all the city governance of Addis Ababa 40-60 saving houses of construction projects even though the level of achievement in Asko and Tourist is 66.7% followed by Bole-Sumit (50%) which is relatively higher achievement. This indicated that all the major construction parties did not have equal contribution for project inputs for the overall performance of the projects. It implied that some parties may have preference on the other for the project inputs without considering on the other opposite parties as shown in the Figure 4.9.

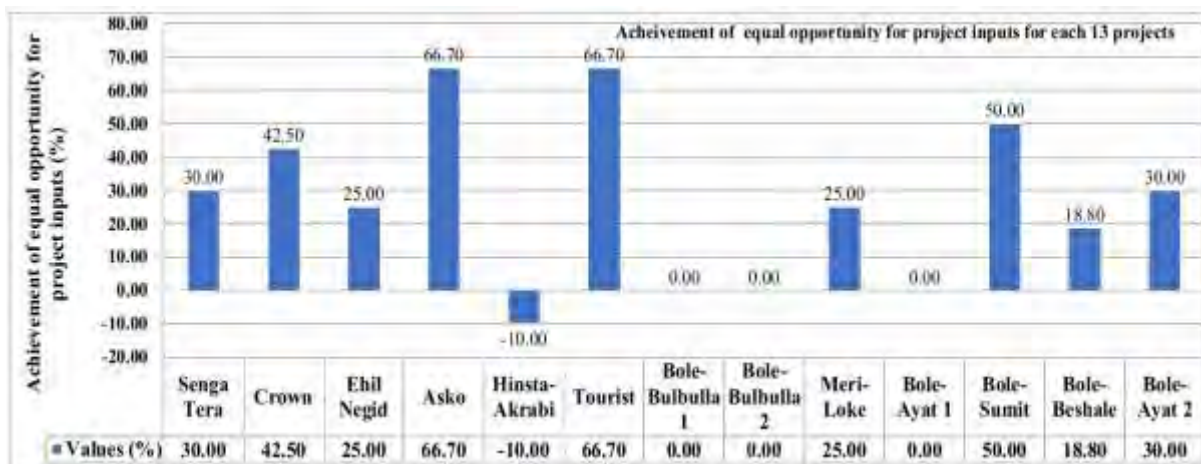


Figure 4.8: Achievement of equal opportunity for project inputs for each projects.

However, equitable team relationships and respect dimension of team integration is achieved 75% (low) level in this site. In the other hand, equitable team relationships and respect dimension of team integration is achieved 75% which is better achievement than in all of other sites.

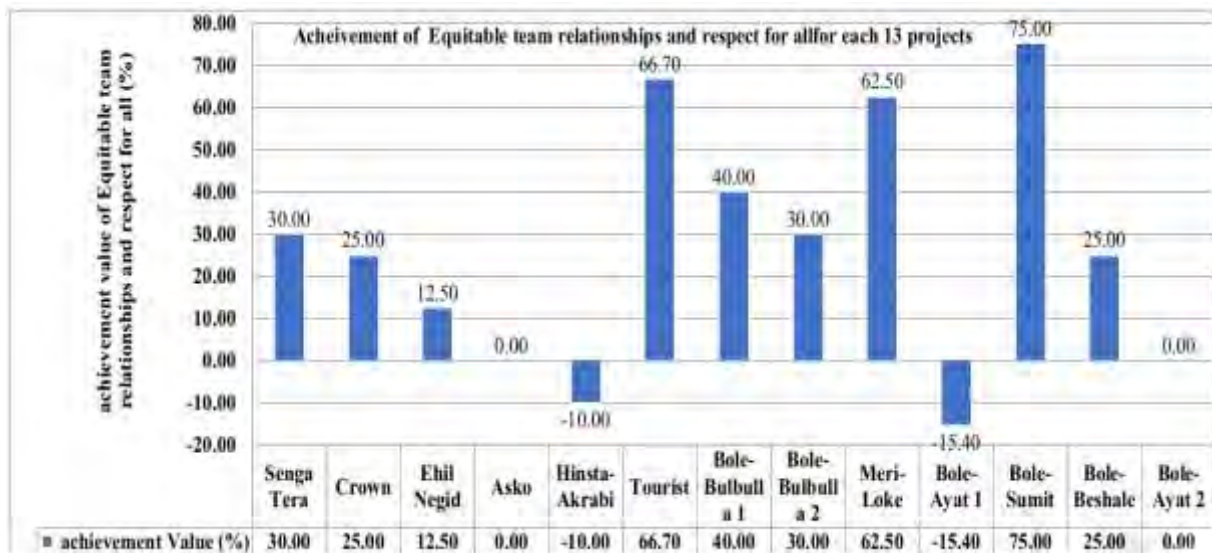


Figure 4.9: Achievement of equitable team relationships and respect for each of projects.

Furthermore, the tenth (10th) dimension of team integration, 'no blame culture' has a high level of achievement (66.67%) among a major construction parties in Tourist 40-60 construction of housing project. This implied that these major construction parties did not blame on each other; and hence they work their jobs upon their responsibility.

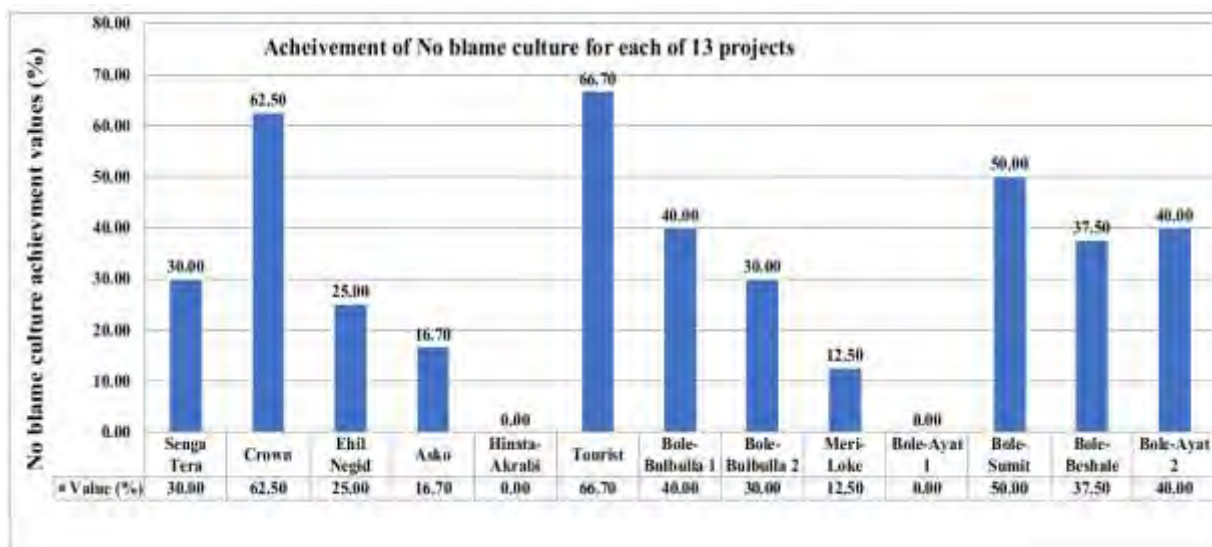


Figure 4.10: Achievement of No blame culture for each of projects.

Finally, based on the individual LoA of each dimensions of team integration, the researcher determined the project level of achievement (PrLoA) using an average LoA, summing up of all ten dimensions of team integration of LoA divided by 10 for the better understanding of all the thirteen (13) construction projects' extent of team integration from an overall perspective.

Accordingly, Tourist 40-60 saving houses of construction project has a highest PrLoA (53.33%) and hence was ranked first whereas Meri-Loke has a smallest PrLoA (21.25%) next to Bole-Ayat 1 site its PrLoA was 18.08%. Bole summit, Senga-Tera, Ehil-Negid, Bole-Bulbulla 1 and Bole-Bullbulla 2 project sites whose PrLoA are 45.00%, 39.00%, 37.50%, 35.00% and 33.0% are ranked second, third, fourth, fifth and sixth, respectively, based on their project level of achievement as per the survey data. However, Crown, Asko, Bole-Ayat 2, Bole-Beshale and Hinsta-Akrabi project sites are ranked seventh, eighth, ninth, tenth and eleventh which have PrLoA values 32.50 %, 31.67%, 31.00%, 30.63% and 23.00%, respectively. Figure 4.11 elaborates more about the project level of achievement of team integration for all 13 Addis Ababa housing construction project sites.

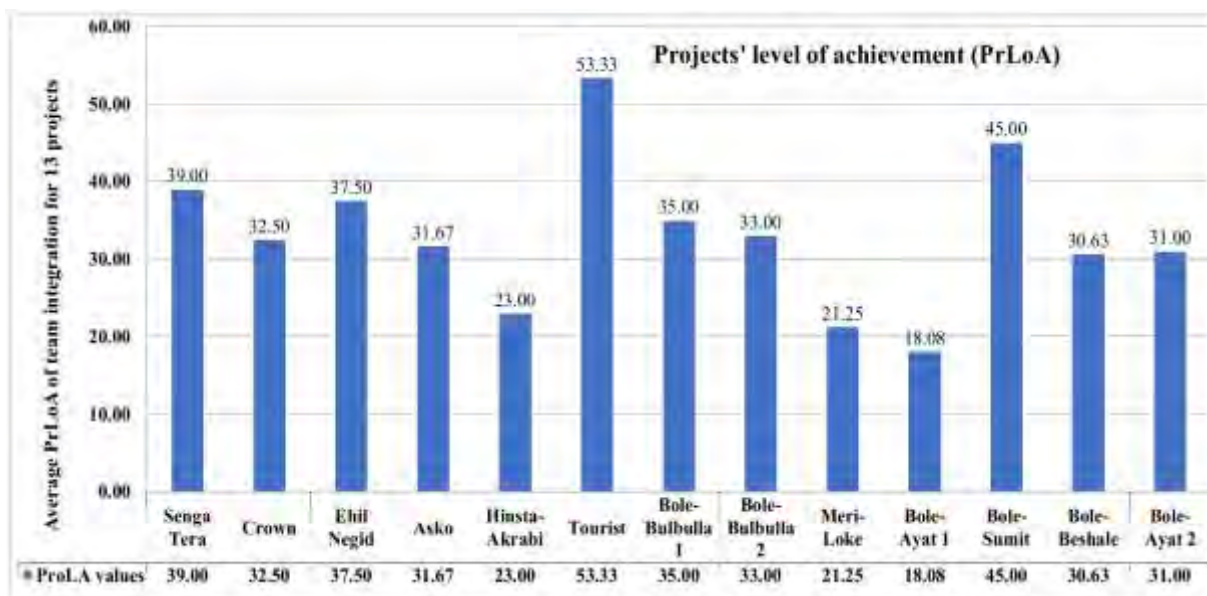


Figure 4.11: Average level of achievement of team integration for all Addis Ababa 40-60 saving houses of construction projects.

According to the analysis result obtained from the survey data, the major construction parties are not integrated to work together for the case of 13 Addis Ababa 40-60 saving houses of construction projects except from Tourist project site which achieved more than 50%

(53.33%) as indicated in the Figure 4.11 and Table 4.13. From the Figure 4.2, the major construction parties are integrated better in the Tourist project sites. This implied that the project teams might work closely in the Tourist site whereas the projects team integration is shown least in Bole-Ayat 1 project site as compared to other project sites.

Furthermore, the integration achievement of major construction parties for the case of 13 Addis Ababa 40-60 saving houses of construction projects is not that good as compared to with the UK construction projects team integration practice (Baiden et al. 2006). The percentage achievement (the average values of 10 dimension of team integration for 13 construction projects) of most of the dimensions of team integration in the Addis Ababa housing construction project practice is below 50%. Figure 4.12 indicated that only 4 of 10 dimensions of team integration are achieved more than 50%. Single team focus and objective, seamless operation with no organizational defined boundaries, unrestricted cross-sharing of information and mutually beneficial outcome achieved integration of major construction parties for the case of 13 Addis Ababa construction projects; 70.36%, 59.13%, 54.70% and 50.87%, respectively.

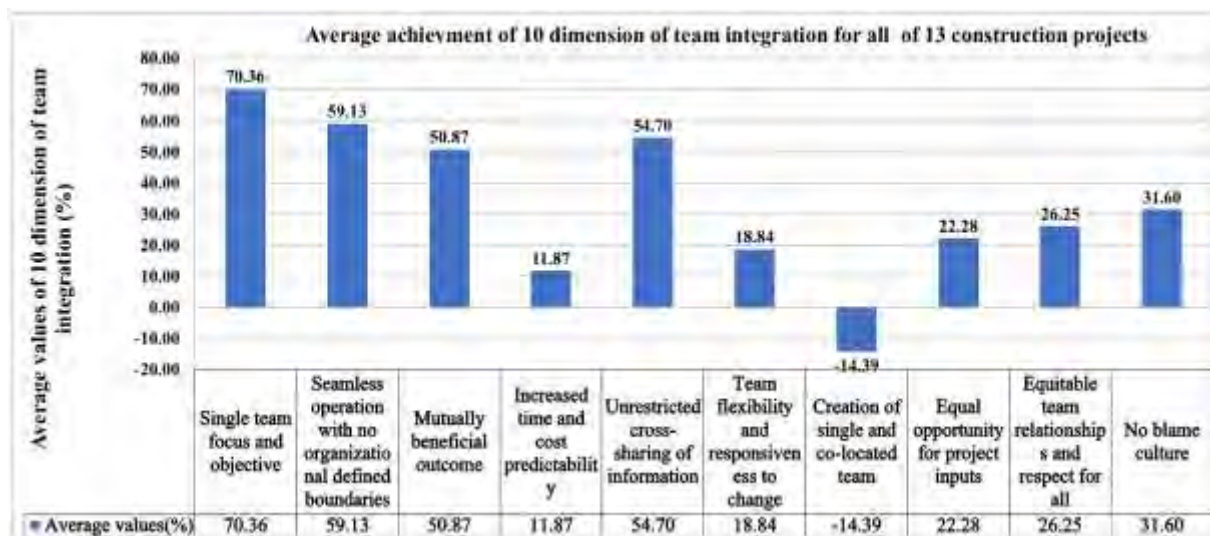


Figure 4.12: Average achievement of 10 dimension of team integration for each Addis Ababa 40-60 saving houses of construction projects.

According to the study by Baiden *et al* (2006), the studied UK construction projects, all of the teams achieved a degree of flexibility that enabled them to respond well to changes in personnel requirements on the project. They were able to bring in more members as the project progressed. Members whose roles and functions had been completed were relocated and new members brought in to maintain both efficiency and progress. However, in Addis

Ababa 40-60 housing construction projects, the personnel were not working in flexible basis and there is a trend of using the same project team members even when the personnel had outlived their effectiveness. However, seamless operation with no organizational defined boundaries was not achieved in UK construction projects. Baiden et al. (2006) study indicated that seamless operation with no organizational defined boundaries was not achieved in 7 construction projects out of 9 construction projects. Similarly, in case of 13 Addis Ababa construction projects, none of the projects achieved full (100%) level of integration instead the average percent of achievement of this dimension of team integration is relatively better (70.36%). Creation of single team that was co-located was an extremely low (-14.39%) achieved among the major construction parties in case of 13 Addis Ababa construction projects even though there were not able to form a new single team that was co-located in UK construction projects.

Likewise, in the studied UK construction projects, there were no equitable relationships and 'no blame' cultures and thus tended to work towards the joint resolution of problems. Besides the UK project teams formed good relationships at the early stages of the project, which led to high levels of trust and removal of adversarial attitudes; and created a project culture where all participants worked towards a common project goal as compared to the Addis Ababa housing construction project teams (Baiden et al, 2006).

From the analysis result, it is shown that none of the Addis Ababa 40-60 saving houses of construction project teams were totally fragmented or integrated. The various members of the project teams were not able to create single team that was co-located and teams in all projects exhibited the lowest degree of integration in relations to this dimension in Addis Ababa housing construction project. However, various teams on all projects exhibited better degree of integration in relations to single team focus and objective dimension explored. They all showed varying levels of full or partial integration. These findings do not necessarily undermine the importance of integrated teams, but indicate that even the very vital examples in the Addis Ababa housing construction projects.

Moreover, according to achievement of 10 dimensions of major parties' team integration for all thirteen 40-60 construction housing projects' PrLoA result, it is important to investigate

the major problems which affect the integration achievement of major construction parties in the city governance of Addis Ababa 40-60 saving houses of construction projects.

4.1.5 Major integration problems which affect the integration of major construction parties in AASHCP

The reliability of survey data was first checked for the accuracy of the data using the Cronbach's alpha coefficient formula in order to measure the internal consistency of the collected data. Accordingly, the Cronbach's coefficient for the individual parties was checked before the further analysis of the data. The analysis showed that the Cronbach's coefficient for the contractors, consultants, clients and regulatory bodies are 0.7165, 0.7555, 0.7751 and 0.86, respectively.

Moreover, the Cronbach's alpha coefficient for the overall respondents (all parties) was also checked and the value is 0.7484 as shown in the Appendix C (Section E). From this, it is clear that the Cronbach's coefficient values for all of the individual parties are above 0.70. As a rule of thumb, the survey data is reliable if the Cronbach's coefficient values are greater than 0.7. Accordingly, all the survey data collected from all of the major construction parties was used for further analysis.

After checking the reliability of the survey data, the relative importance index method was employed to determine the relative importance of the various major integration problems that affect the integration of major construction parties in the city governance of Addis Ababa 40-60 saving houses of construction projects. This method was adopted in this study within various groups (clients, consultants, contractors and regulatory body (Ministry of Urban Development and Housing). The four-point scale ranged as 1 (not at all), 2 (minor), 3 (moderate) and 4 (serious) were adopted and transformed to relative importance indices (RII) for each factor as follows:

$$RII = \frac{\sum(W/A * N)}{N} \dots \dots \dots (4.2)$$

Where W is the weighting given to each factor by the respondents (ranging from 1 to 4), A is the highest weight (i.e. 4 in this case), and N is the total number of respondents (69 is the total numbers of respondents).

The RII value had a range from 0 to 1 (0 not inclusive), the higher the value of RII, a more important was the problem. The RII was used to rank the different integration problems.

These rankings made it possible to cross-compare the importance of the major integration problems as perceived by the four groups of respondents (i.e. clients, consultants, contractors and regulatory body (Ministry of Urban Development and Housing)). Data collected from 69 respondents were analyzed using this RII method. The RII value of integration problems from an overall and individual parties' perspective is shown in Table 4.15 and in Appendix E, respectively. This RII value explains how far the integration problems affect the integration of major construction parties in the construction project of city governance of Addis Ababa 40-60 saving houses of construction projects.

Before, the ranking of major integration problems, the researcher conducted an analysis of importance index of major integration problems based on the survey data of each respondents for each of four respondents category and rank of individual integration problems within the four groups of respondents.

In addition to the ranks of major integration problems for each respondent category, the correlation coefficients of major integration problems ranked by each respondents' category was also analyzed to identify the relation/correlation of integration problems before the analysis of average importance index for major integration problems from an overall perspective.

Accordingly, based on the ranking of major integration problems, the correlation coefficient between clients and contractors is 0.4943, clients and regulatory body is 0.6943, clients and consultants is 0.7348, contractors and consultants 0.7057, consultant and regulatory body is 0.3352 and contractor and regulatory body is -0.1626.

According to the correlation coefficients obtained from survey data, clients and regulatory body (0.6943), clients and consultants (0.7348), and contractors and consultants (0.7057) agree that the proposed major integration problems affect the integration of major construction parties in the Addis Ababa 40-60 saving houses of construction projects whereas contractor and regulatory body (-0.1626) disagree about these integration problems. This implied that these parties have different perception about the integration problems affecting the integration of major construction parties. In the other side, clients and contractors (0.4943) moderately agree that the proposed integration problems may affect the integration of major construction parties.

Furthermore, after the identification of the correlation coefficients (to know agreement between parties), the importance index and rank of integration problems was calculated. The details of importance index, ranks of major integration problems and correlation coefficient between the respondents of different category are shown in Appendix D.

After the analysis of the importance index for major integration problems for each respondent's category, the 'importance index' of major integration problems was calculated in order to rank these problems from an overall and individual parties perspective as shown in the Table 4.15 and 4.16, respectively.

As the Table 4.15 illustrates, it was identified that the perceptions of respondents on 24 integration problems affecting the integration of major construction parties in the case of city governance of Addis Ababa 40-60 saving houses of construction projects are presented first from an overall perspective.

A Study on Problems Affecting the Integration of Major Construction Parties in Design-Bid-Build Project Delivery Method in the Addis Ababa 40-60 Housing Construction Projects

Table 4. 15: Importance indexes for each of integration problems and ranks as per the overall respondents' survey data

No	Major problem/s which affect the integration of major construction parties in Addis Ababa 40-60 saving houses of construction projects	Extent of problems based on scale of important problems for the sum of all respondents (together)						Rank (from overall respondents perspective)
		1(Not at all)	2(minor)	3(mode rate)	4(serious)	total	RII (total respondents)	
11	Self-serving objectives; lack of co-ordination; Lack of trust and reliability among contracting parties; and disregarding contextual issues	-	6.00	20.00	43.00	69.00	0.8841	1
9	Poor communication between relevant construction parties	-	9.00	24.00	36.00	69.00	0.8478	2
1	Lack of knowledge by the client about project processes and integration issues, and inadequate technical skill by the client	-	9.00	25.00	35.00	69.00	0.8442	3
6	Lack of commitment by involved parties	-	10.00	25.00	34.00	69.00	0.8370	4
3	Inadequate preparation and planning before commencement of a project	-	14.00	20.00	35.00	69.00	0.8261	5
13	Lack of clearly defined responsibility of each contracting party in the contract for the project	1.00	13.00	21.00	34.00	69.00	0.8188	6
5	Lack of personnel, financial and physical resources by owners, contractors and consultants for construction project relative to requirements	-	13.00	27.00	29.00	69.00	0.8080	7
12	Lack of creating integrated single project team with all members located together in a project	1.00	12.00	26.00	30.00	69.00	0.8080	7
17	Bureaucratic client organization and greater process and administrative rules and regulations	-	15.00	24.00	30.00	69.00	0.8043	8

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No	Major problem/s which affect the integration of major construction parties in Addis Ababa 40-60 saving houses of construction projects	Extent of problems based on scale of important problems for the sum of all respondents (together)						Rank (from overall respondents perspective)
		1(Not at all)	2(minor)	3(mode rate)	4(serious)	total	RII (total respondents)	
8	Technical incompetence and limited personal experience of contractor	-	15.00	25.00	29.00	69.00	0.8007	9
18	Lack of integration management among the contracting parties by the clients	-	15.00	26.00	28.00	69.00	0.7971	10
19	Lack of involvement of contractor in design development phase	-	14.00	29.00	26.00	69.00	0.7935	11
7	Technical incompetence and limited personal experience of consultant	-	11.00	36.00	22.00	69.00	0.7899	12
15	Inadequate contract and specification	2.00	12.00	29.00	26.00	69.00	0.7862	13
10	Insufficient design communication between consultant and owner	-	16.00	29.00	24.00	69.00	0.7790	14
4	Lack of integrated planning and scheduling for different contracting parties	-	20.00	26.00	23.00	69.00	0.7609	15
2	Unwilling and unenthusiastic participation of contracting parties	-	18.00	30.00	21.00	69.00	0.7609	16
14	Inadequate design information in the contract	-	20.00	28.00	21.00	69.00	0.7536	17
21	lack of strong, professionally experienced and responsible client	4.00	16.00	31.00	18.00	69.00	0.7283	18
16	Lack of modern contracting system among construction parties (such as partnering)	2.00	19.00	31.00	17.00	69.00	0.7283	19
20	Interpersonal and organizational culture difference	7.00	26.00	20.00	16.00	69.00	0.6630	20
24	Absence of any risk reward plans for different parties	8.00	19.00	34.00	8.00	69.00	0.6522	21
22	Geological conditions	15.00	33.00	19.00	2.00	69.00	0.5290	22
23	weather conditions on site	34.00	18.00	15.00	2.00	69.00	0.4457	23

Accordingly, it is shown that ‘self-serving objectives; lack of co-ordination; lack of trust and reliability among contracting parties; and disregarding contextual issues’ is the most important problem affecting integration among major construction parties followed by ‘poor communication between relevant construction parties’, ‘lack of knowledge by the client about project processes and integration issues, and inadequate technical skill by the client’, ‘lack of commitment by involved parties’; and ‘inadequate preparation and planning before commencement of a project’ respectively. ‘lack of clearly defined responsibility of each contracting party in the contract for the project’, ‘lack of personnel, financial and physical resources by owners, contractors and consultants for construction project relative to requirements’, and ‘lack of creating integrated single project team with all members located together in a project’ and ‘bureaucratic client organization and greater process and administrative rules and regulations’ are ranked 6th, 7th and 8th, respectively.

‘Technical incompetence and limited personal experience of contractor’ (rank 9), ‘lack of integration management among the contracting parties by the clients’ (rank, 10) and ‘lack of involvement of contractor in design development phase’ (rank, 11) are more important than ‘technical incompetence and limited personal experience of consultant’ (rank 12) whereas ‘inadequate contract and specification’ (rank, 13) is more important than ‘insufficient design communication between consultant and owner’ (rank,14). On the one hand, ‘lack of integrated planning and scheduling for different contracting parties’ (rank, 15) is more important problem than ‘lack of modern contracting system among construction parties (such as partnering)’ (rank, 19) and ‘inadequate design information in the contract’ (rank, 17).

On the other hand, ‘unwilling and unenthusiastic participation of contracting parties’ (rank, 16) is more important than ‘lack of strong, professionally experienced and responsible client’ (rank, 18), and ‘interpersonal and organizational culture difference’ (rank 20). Moreover, ‘absence of any risk reward plans for different parties’ (rank, 21) is more important than ‘geological conditions’ (rank, 22). Finally, ‘weather conditions on site’ (rank 23) is the least important integration problems with a lower measuring importance index (0.4457). Table 4.17 shows the relative importance index and their respective rank of major integration problems based on the survey data for the case of governance of Addis Ababa 40-60 saving

houses of construction projects using an average importance index of all four individual parties.

Different respondents from four parties participated in the survey data and responded their perception about the major integration problems differently. Accordingly, the perception of individual parties consisting various members and the overall respondents' perceptions is presented in the following section.

4.1.5.1 Top ten problems affecting integration of major parties in Addis Ababa 40-60 saving houses of construction projects from individual parties perspective

It was identified that different parties responded their perception for the 10 most important integration problems as shown in the Appendix E.

According to the perception of both consultants and clients, it was identified that 'self-serving objectives; lack of co-ordination; lack of trust and reliability among contracting parties; and disregarding contextual issues' is the most important problem affecting integration among major construction parties but the 2nd most important integration problem for contractors followed by 'lack of clearly defined responsibility of each contracting party in the contract for the project'.

In the one hand, according to the perceptions of regulatory body, 'poor communication between relevant construction parties', 'lack of commitment by involved parties', 'lack of knowledge by the client about project processes and integration issues, and inadequate technical skill by the clients', 'lack of personnel, financial and physical resources by owners, contractors and consultants for construction project relative to requirements', 'lack of integrated planning and scheduling for different contracting parties' are the most important integration problems whereas 'self-serving objectives; lack of co-ordination; lack of trust and reliability among contracting parties; and disregarding contextual issues', 'lack of integration management among the contracting parties by the clients', 'inadequate preparation and planning before commencement of a project', 'technical incompetence and limited personal experience of contractor, 'bureaucratic client organization and greater process an administrative rules and regulations' are the 2nd most integration problem affecting integration of major construction parties as shown in the Table 4.16 (Refer Appendix E). This

implied that more than one integration problems are more important and critically ranked at the same rank due to the extent of their seriousness problem on the integration of major construction parties in the Addis Ababa housing construction projects.

In the other hand, ‘lack of commitment by involved parties’ was ranked 3rd and 6th by contractors and consultants respectively. According to the contractors’ response, ‘lack of creating integrated single project team with all members located together in a project’, ‘lack of knowledge by the client about project processes and integration issues, and inadequate technical skill by the client’, ‘poor communication between relevant construction parties’, ‘inadequate preparation and planning before commencement of a project’, ‘bureaucratic client organization and greater process and administrative rules and regulations’ and are ranked 4th, 5th, 6th, 7th and 8th respectively. In addition to these, ‘inadequate contract and specification’ (rank 9) is more important than ‘insufficient design communication between consultant and owner’ (ranked 10) as the perceptions of contractors indicated. Moreover, ‘lack of knowledge by the client about project processes and integration issues’ and ‘inadequate contract and specification’, ‘lack of personnel, financial and physical resources by owners, contractors and consultants for construction project relative to projects requirement’, ‘technical incompetence and limited personal experience of contractor’, and ‘lack of creating integrated single project team with all members located together in a project’ are ranked by the clients 2nd, 3rd, 4th and 5th respectively. However, these problems are important for the clients than for the consultants respectively as shown in the Appendix E.

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Construction Projects

Table 4. 16: Top ten integration problems from individual parties' perspective in Addis Ababa 40-60 saving houses of construction projects (Appendix E).

No.	Top ten most important integration problems which affects integration of major construction parties in the governance of Addis Ababa 40-60 saving houses of construction project from individual parties perspective							
	Problems based on Scale of important problems from contractors perspective	Rank	Problems based on Scale of important problems from consultants perspective	Rank	Problems based on Scale of important problems from regulatory body perspective	Rank	Problems based on Scale of important problems from clients perspective	Rank
1	Lack of clearly defined responsibility of each contracting party in the contract for the project	1	Self-serving objectives; lack of co-ordination; Lack of trust and reliability among contracting parties; and disregarding contextual issues	1	Poor communication between relevant construction parties	1	Self-serving objectives; lack of co-ordination; Lack of trust and reliability among contracting parties; and disregarding contextual issues	1
2	Self-serving objectives; lack of co-ordination; Lack of trust and reliability among contracting parties; and disregarding contextual issues	2	Lack of integration management among the contracting parties by the clients	2	Lack of knowledge by the client about project processes and integration issues, and inadequate technical skill by the client	1	Lack of knowledge by the client about project processes and integration issues, and inadequate technical skill by the client	2
3	Lack of commitment by involved parties	3	Poor communication between relevant construction parties	3	Lack of personnel, financial and physical resources by owners, contractors and consultants for construction project relative	1	Inadequate preparation and planning before commencement of a project	2

A Study on Problems Affecting the Integration of Major Construction Parties in Design-Bid-Build Project Delivery Method in the Addis Ababa 40-60 Housing
Construction Projects

No.	Top ten most important integration problems which affects integration of major construction parties in the governance of Addis Ababa 40-60 saving houses of construction project from individual parties perspective							
	Problems based on Scale of important problems from contractors perspective	Rank	Problems based on Scale of important problems from consultants perspective	Rank	Problems based on Scale of important problems from regulatory body perspective	Rank	Problems based on Scale of important problems from clients perspective	Rank
4	Lack of creating integrated single project team with all members located together in a project	4	Bureaucratic client organization and greater process and administrative rules and regulations	4	Lack of commitment by involved parties	1	Lack of personnel, financial and physical resources by owners, contractors and consultants for construction project relative to requirements	3
5	Lack of knowledge by the client about project processes and integration issues, and inadequate technical skill by the client	5	Lack of personnel, financial and physical resources by owners, contractors and consultants for construction project relative to requirements	5	Lack of integrated planning and scheduling for different contracting parties	1	Poor communication between relevant construction parties	3
6	Poor communication between relevant construction parties	6	Technical incompetence and limited personal experience of contractor	5	Self-serving objectives; lack of coordination; Lack of trust and reliability among contracting parties; and disregarding contextual issues	2	Technical incompetence and limited personal experience of consultant	4

A Study on Problems Affecting the Integration of Major Construction Parties in Design-Bid-Build Project Delivery Method in the Addis Ababa 40-60 Housing
Construction Projects

No.	Top ten most important integration problems which affects integration of major construction parties in the governance of Addis Ababa 40-60 saving houses of construction project from individual parties perspective							
	Problems based on Scale of important problems from contractors perspective	Rank	Problems based on Scale of important problems from consultants perspective	Rank	Problems based on Scale of important problems from regulatory body perspective	Rank	Problems based on Scale of important problems from clients perspective	Rank
7	Inadequate preparation and planning before commencement of a project	7	Lack of knowledge by the client about project processes and integration issues, and inadequate technical skill by the client	6	Inadequate preparation and planning before commencement of a project	2	Lack of creating integrated single project team with all members located together in a project	5
8	Bureaucratic client organization and greater process and administrative rules and regulations	8	Lack of commitment by involved parties	6	Lack of integration management among the contracting parties by the clients	2	Inadequate contract and specification	6
9	Inadequate contract and specification	9	Lack of clearly defined responsibility of each contracting party in the contract for the project	7	Technical incompetence and limited personal experience of contractor	2	Unwilling and unenthusiastic participation of contracting parties	7
10	Lack of involvement of contractor in design development phase	10	Inadequate preparation and planning before commencement of a project	8	Bureaucratic client organization and greater process and administrative rules and regulations	2	Lack of involvement of contractor in design development phase	8

Similarly, ‘Lack of integrated planning and scheduling for different contracting parties’ and ‘lack of involvement of contractor in design development phase’ are ranked by the consultant (rank, 9) and are less important for clients. However, ‘lack of knowledge by the client about project processes and integration issues, and inadequate technical skill by the client’, ‘lack of clearly defined responsibility of each contracting party in the contract for the project’, ‘inadequate preparation and planning before commencement of a project’ and ‘unwilling and unenthusiastic participation of contracting parties’ are ranked 6th, 7th, 8th and 10th, respectively.

Furthermore, the ranking of the major integration problems are different according to different perception of respondents; and more than one problem might have similar rank by the category of respondent parties. For instance, for the regulatory body, more than one problems were ranked in similar level and by this party all the integration problems are ranked up to 7. This implied that there are more important problems which have similar effect on the integration of parties in the case of Addis Ababa 40-60 saving houses of construction projects. Besides, as the survey data indicated, the importance level of integration problems might different among the individual parties. This implied that the most important problem for one party might but might not be the same for other.

4.1.5.2 Top ten problems affecting integration of major construction parties in Addis Ababa 40-60 saving houses of construction projects from the overall perspective

As it is indicated in the Table 4.16, there were 24 integration problems selected which affect the integration of major construction parties in the case of governance of Addis Ababa 40-60 saving houses of construction projects and were analyzed based on the survey data. Accordingly, the importance index of major integration problems was analyzed to solicit their ranking and the top 10 major integration problems as shown in the Figure 4.14.

4.1.5.2.1 Self-serving objectives; lack of co-ordination; lack of trust and reliability among contracting parties; and disregarding contextual issues

According to the survey respondents, ‘self-serving objectives; lack of co-ordination; lack of trust and reliability among contracting parties; and disregarding contextual issues’ for the 40-60 housing program affects the integration of all major construction parties while they are performing their construction activities.

This implied that if these parties are purely focusing on their own priorities and interests, poor coordination will follow and they are willing to make every effort to avoid their own mistakes (that lead to financial penalty or loss of profit), instead of considering the situation of others and conducting timely coordination for them. This problem clearly explained the tendency of mistrust, mischief and conflict turning behind major construction parties', and work against a better performance of the projects. Besides, ignorance of the circumstantial issues related to the construction of 40-60 housing construction projects may create bad perception on the other party leading to non-cooperative for the remaining period of works. This may result to the disintegration of parties and disintegrate the cooperation effort of these parties and can lead to loss of productivity of the involved parties. This is consistent with the findings of Wubshet (2004) and Rahman and Kumaraswamy (2005) as they indicated that developing a consistent project culture is essential to overcome professional segregation among the construction parties.

A Study on Problems Affecting the Integration of Major Construction Parties in Design-Bid-Build Project Delivery Method in the Addis Ababa 40-60 Housing Construction Projects

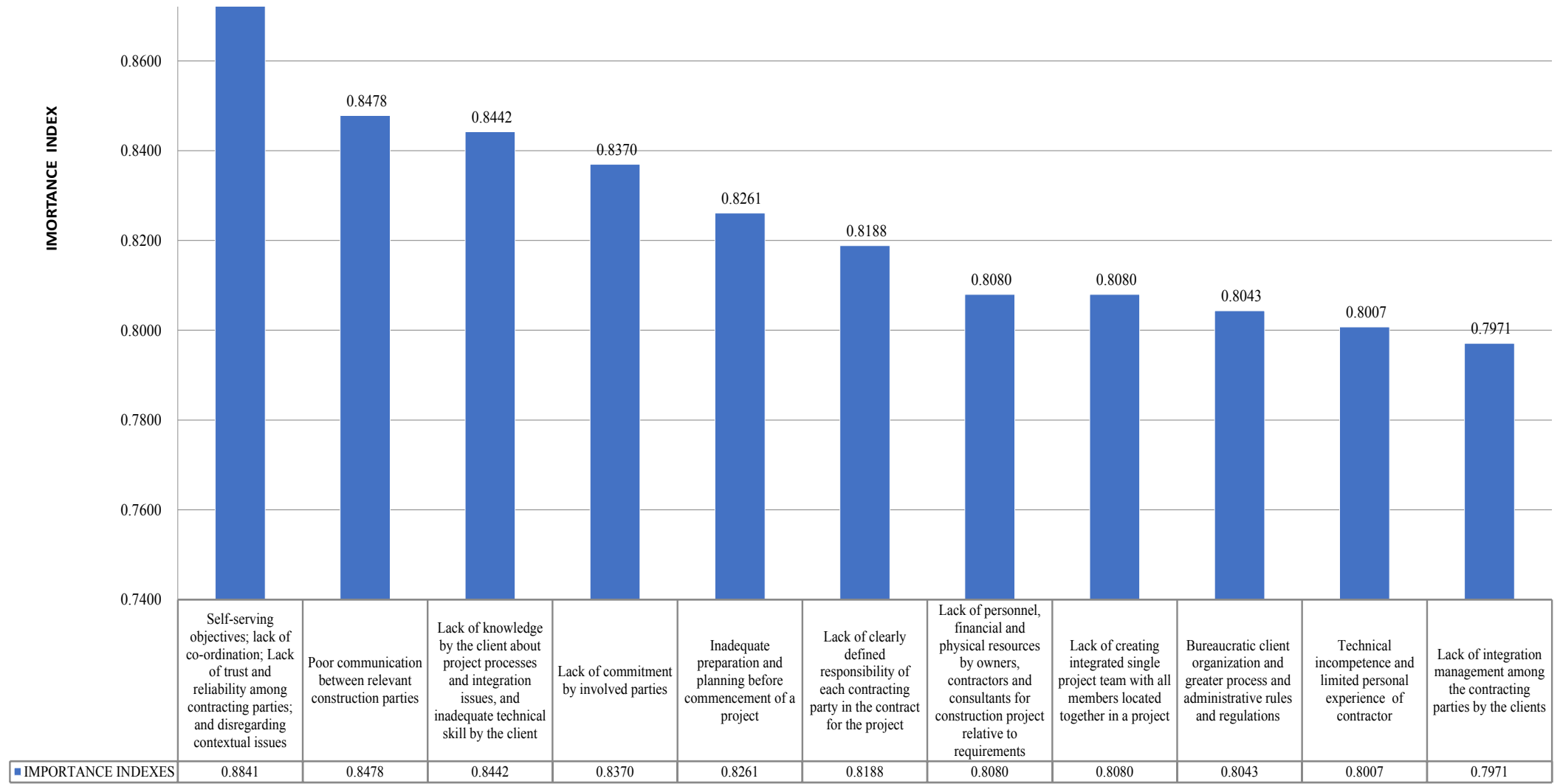


Figure 4.13: Top 10 most important integration problems that affect integration of major construction parties in Addis Ababa 40-60 housing projects

4.1.5.2.2 Poor communication between relevant construction parties

It was identified that poor communication between or among the major construction parties is ranked secondly by its effect on the integration of major construction parties in Addis Ababa 40-60 housing construction projects. The integration problem explained that communication is the activity of conveying information and this poor communication among the involved relevant parties create an information gap concerning the projects' information and related issues. The studied projects involve many construction parties, which cannot function effectively without good communication among the participants. This back and forth flow of information is essential for project success. This poor communication causes a wide variety of design errors, conflicts, delays, and project failures, which reduce the overall performance of project participants as well as the quality of the final product. Besides, the perceptions of the respondents is consistent with the findings of Sebastiaan (2014) and Wubshet (2004). They identified in their study that the information gap creates weak relationship among the construction parties and cause disintegration among the major construction parties.

4.1.5.2.3 Lack of knowledge by the client about the project processes and integration issues, and inadequate technical skill by the client

The lack of knowledge by the client about the Addis Ababa 40-60 saving houses of construction project processes and the integration issues (for instance each construction phases and disciplines of major parties) and inadequate technical skills by the clients (practical construction planning skill, construction skill, design skill and integrated knowledge of theses all skills) affects to adequately manage the construction of Addis Ababa 40-60 housing projects. This is because, to deliver these projects, they depend on the knowledge and skills of clients about project processes, multiple firms and professionals who are mostly participated in different locations of project sites. From the study, the problem explained that the clients do not have an adequate construction project management knowledge to lead and guide the Addis Ababa 40-60 construction projects efficiently. The case study result also indicated that the client cannot award and start new 40-60 construction projects except the 13 projects due to the lack of knowledge of Addis Ababa 40-60 saving houses of construction projects even though the budget is ready to be allocated and more number of 40-60 house seekers deposit their money 100%. This fragmentation requires high coordination among the many participants to maintain continuity in the communication of the

design as it evolves from a simple idea to a completed construction physical product. Thus, having failed of technical knowledge and processes (to coordinate and manage the works effectively) by the client may create a major parties' disintegration. Thus, having a sufficient knowledge of construction project management processes is essential. As a result, the client at least shall admit their weakness and leave the position to the professionals which have capability of managing the construction projects.

4.1.5.2.4 Lack of commitment by involved parties

This might be due to the lack of commitments of the individual parties. This is because, it may result to the negligence of the requesting party upon the issue of the Addis Ababa 40-60 saving houses of construction projects. Thus, in case there is the issue of meeting for the common project issue, the absence of one party may result to the missing of one part and create disintegration for the success of Addis Ababa 40-60 saving houses of construction projects.

Besides, the loss of commitments by all parties involved in a project affects their own scope of the project and their own interests. This lack of commitment by the involved parties could lead to poor and inefficient coordination between the different parties. The interviews during the case study indicated that most of the consultant and site supervisors inspecting the work come by phone call when the contractor or other party demand them; and even they sometimes do not come and postpone the work due to their absence on site.

For instance, if the consultant was not found on the site and the contractor would be going to request a work a permit, the staff of the contractor's staff would be idle for or obliged to order the workers to leave the site until the all the parties come to the site. Moreover, if the client interested with the contractor and is not found there, all of the parties cannot do their job due to loss of commitment by all involved parties.

4.1.5.2.5 Inadequate preparation and planning before commencement of a project

Inadequate preparation and planning before the commencement of city governance of Addis Ababa 40-60 saving houses of construction projects is ranked as one the integration problem based on the respondents' perception. This implied that which party/ies shall work what? What work shall be executed first? How the works can be executed to meet the performance of projects in integrated manner? What thing/s is/are required? And similar preliminary issues

affect the integration of major construction parties for the case of Addis Ababa 40-60 housing construction projects. These lead to discontinuous work behavior like suspension of works resulting parties' disintegration during construction phase due to failure of adequately answering these questions during early preparation and planning which results to an integration gap among the major integration parties during the execution period of Addis Ababa 40-60 housing projects (Abebe, 2008).

4.1.5.2.6 Lack of clearly defined responsibility of each contracting party in the contract for the project

According to the perceptions of respondents, the inadequate provision of responsibilities of each contracting party is sufficiently defined in the contract document of the project. This might affect the integration of major construction parties due to failure of knowing their responsibility while they were executing their project. This is because it helps to maximize the chance of commitment of all involved in every moment of work about their collaboration effort parallel to their construction works. For instance, if all of the parties' responsibilities related to the commitment and their legal implications are defined and incorporated in the contract, it may contributed to the parties' integration accordingly.

4.1.5.2.7 Lack of personnel, financial and physical resources by clients, contractors and consultants for construction project relative to requirements

On the other hand, the availability of resource owned by the major construction parties is one the factors affecting the integration of major construction parties for the construction of Addis Ababa 40-60 housing construction projects is ranked fourth major integration problem as per the analysis result. This implied that lack professionally experienced manpower (lack of knowledge about project integration, other skills (web-based project management skills)), financial problem (inadequate financial sources to provide sufficient physical resources such as modern web-based technologies (IT technologies) and to train professionals; and to hire capable professionals to administer these technologies) and lack of supply of physical resources for the projects by the involved parties may create loss of integration among the major integration problems.

Besides, it was identified in the case study that payment delay cause financial problem in some cases and most of the contractors and consultants await the payment even if the work is suspended for a lot of days sometimes for months unless the payment is released. This cause some parties' workers to leave the site while some remainders were working separately. This is because most of the parties' payment releasing period differs and integration problems occurred accordingly.

4.1.5.2.8 Lack of creating integrated single project team with all members located together in a project

From the analysis result, it was identified that due to integration problem, it was not possible to form an integrated construction team since they operated within a different office location at the project. According the perception of respondents, they remained as individual teams within their confined work spaces. The construction parties' office is located near by the project. However, the clients and the consultants' office are close to each other, however, even their collaboration is limited. However, the contractors' office is far away and the offices of these parties and their communication is limited on letters and inspection papers. Furthermore, the regulatory body conducted a site visit randomly without the having its office in the site. And regulatory body exclusively do not integrated with other parties instead this body look the overall performance of the other parties. This implied that each parties' communication is limited on issued letter. This limits the collaboration of construction parties and resulted to disintegration which is consistent with the previous studies (Sebastiaan, 2014 and Baiden *et al*, 2006).

4.1.5.2.9 Bureaucratic client organization and greater process and administrative rules and regulations

According to the respondents' perception, bureaucratic client organization and greater process and administrative rules and regulations is ranked 8th of the major integration problems which affects the integration of the participating parties in Addis Ababa 40-60 saving houses of construction projects. This implies that the longer the process to get any response from the client, the less the requested issue is obtained due to the long time wait to get an answer for the issue. For instance, if one of the parties working among the interconnected team faces a project related problem and requests the client for the problem,

this working team might wait for some period of time and then the team disintegrates if the clients lack timely response and solve the issues. Besides, the late checking of the compatibility and confirmation of regulations and rules after the projects are commenced, they will take a long process and create a gap of integration among the involved parties during the construction period until the rules and regulations issues solved in lengthy processes (Wubshet, 2004).

4.1.5.2.10 Technical incompetence and limited personnel experience of contractor

According to the perceptions of the respondents, technical incompetence and personnel limited personnel experience of the contractor is identified as another integration problem which affects the integration of major construction parties in the case of Addis Ababa 40-60 saving houses of construction projects. This problem explained that technical incompetence (incompatible knowledge about the project and knowledge gap among the involved parties relative to the projects technical skill requirements) and insufficient personnel experience (this includes lack exposure of Addis Ababa 40-60 saving houses of construction projects and minor construction experience) did not make the parties to work collaboratively, and produces different output and creates difference on the performance of Addis Ababa construction projects.

4.1.5.2.11 Lack of integration management among the contracting parties by the clients

According to the survey data, 'lack of integration management among the contracting parties by the clients' is ranked the 10th integration problem which affects the integration of major construction parties in Addis Ababa 40-60 saving houses of construction projects. This implied that the uppermost management knowledge of project clients to make or prepare a contract, to manage and coordinate, and to follow up the Addis Ababa 40-60 saving houses of construction projects' related issues; such as lack of understanding the importance of the integration management process, missing of the management processes, lack of clients' crucial coordination management skill to create a climate in where everyone participates and interacts proactively (PMI, 2000).

4.1.6 Possible recommendations of respondents to enhance integration for the case of Addis Ababa 40-60 saving houses of construction projects

Out of 69 respondents, 56 (81.16%) of respondents agree that there is a possible recommendation for integration problems in their organization to enhance alignment and coordination among the major construction parties in the case of city governance of Addis Ababa 40-60 saving houses of construction projects to enhance integration for the future similar project. However, among these 56(81.16%) respondents only 47 (68.12%) forwarded their recommendation to enhance the integration among the major construction parties whereas 4 (5.8%) respondents said ‘no’ possible recommendation and 9(13.04%) of respondents said nothing about the integration improvement neither ‘yes’ nor ‘no’ as shown in table 4.17.

Table 4.17: possible recommendations by respondents to increase integration among major construction parties

Respondents possible recommendation for integration problems	Number of respondents	Percentage (%)
Yes with recommendation	47	68.12
Yes, but no recommendation	9	13.04
No	4	5.80
No opinion about	9	13.04
Total	69	100.00

According to the perceptions of respondents, the many possible recommendations are forwarded. These includes:

- Sufficient land preparation and access early,
- Design have to be completed before the construction commencement,
- Preparation of resources in advance: especially some materials like reinforcement and cement supplied by the clients which will create a stoppage and scarcity,
- Management of clients has to improved and shall be led by professionals,
- The contract type shall be full contract instead labor contract,
- Knowledge of clients has to be updated and replaced by good professional who have engineering back ground if the client wants to intervene the process,

- Consultants shall consult the clients and the contractors adequately and professionally and use their full effort with construction project management,
- Communication and trust between contractors and consultants shall be enhanced,
- Periodical site meeting and progressive evaluation, and
- Creating integrated construction team consisting all parties' member for each of 40-60 housing construction project.

According to the perceptions of respondents, the possible mitigation of integration problems to increase the collaboration of major construction parties are related to management of major problems in the survey study. From this, managing the identified integration problems helps to increase the integration of major parties involved in Addis Ababa 40-60 saving houses of construction projects. This implied that as the survey study's result indicated, it is possible to diminish the integration issues if the integration problems identified from an overall and individual parties' perspective will be managed adequately and this is consistent with previous study (Baiden *et al*, 2006; Sebastiaan, 2014; and La hart, 2007).

4.1.7 Possible recommendations of respondents about interface management to enhance integration for the case of Addis Ababa 40-60 saving houses project

According to the survey data, 36 (52.17%) of the respondents said that interface management helps to improve integration among the major construction parties for the case of Addis Ababa 40-60 saving houses of construction projects. But, 19 of these respondents do not say anything how to it shall be used for as shown in the Table 4.18.

Table 4.18: Perceptions of respondents about interface management for integration problems

Perceptions about interface management for to enhance integration	Number of respondents	Percentage (%)
Yes with opinion	36	52.17
Yes, but no opinion	19	27.54
No	6	8.70
No opinion about	8	11.59
Total	69	100.00

From the table, it is shown that majority of the parties believe that interface management helps to enhance integration among the major construction parties even though 19 (27.54 %)

parties did not forward their opinion how it could be implemented and 14 (20.29%) did not respond about this proposed treatment mechanism.

Moreover, 36 (52.17%) respondents forward the way of interface management implementing for the case of city governance of Addis Ababa 40-60 saving houses of construction projects. These include:

- Establish the central, topmost, responsible body that administers checks and confirms the execution process of Addis Ababa 40-60 housing construction projects. This implied that the central body checks and balances the interfaces (links between construction elements, phases and different disciplines) during the execution of these projects,
- Identifying the responsibilities of all parties at early stage for incase to know the failure of responsible party for integration problem,
- Common platform using web-based project management communication media,
- Understanding construction phases and subsequent part's/parties' responsibility,
- Preparing training to improve common understanding for different disciplines, and allow participation of all members of parties, and
- Identifying technical and managerial tasks and assigned candidate as per the job position for fast enquiry and response.

According to the perceptions of respondents, the interface management focuses on the interactions of involved parties and managing of their responsibility as per the requirements of Addis Ababa 40-60 housing construction projects.

As the previous study indicated (Chen *et al.*, 2006), interface management is considered as the process of managing communications, responsibilities and coordination of project parties, phases, or physical entities which are interdependent. Moreover, the perceptions of respondent is consistent with study made by Sebastiaan (2014). He indicated that integration problem is occurred due to its uniqueness behavior (i.e., temporary multi-part organization, different parties involve in different and interrelated phases of project) without sufficient interface management system (Sebastiaan, 2014). Accordingly, sufficient interface management starts with the identification of the interfaces among the major construction parties and is an ongoing process throughout the life of project with the goal of maintaining

the balance between scope, time, cost, quality, and resources (Sebastian, 2014; and Chen *et al*, 2006).

4.2 Summary of survey data analysis

This section describes the result of survey data analysis. The survey study was conducted on problems affecting integration of major construction parties which participated in the Addis Ababa 40-60 saving houses of construction projects which have different progress status and location. In this survey study, 69 questionnaires were returned from the total of 98 questionnaires which were distributed for contractors, consultants, regulatory body and client project offices. Most of the respondents have superior experience and were working in managerial position in the Addis Ababa housing projects and related building projects.

In this study, the level of construction parties' integration were also investigated and analyzed using a weighted average approach. It indicated that the level of construction parties' integration in 13 Addis Ababa 40-60 saving houses of construction projects was not achieved.

Moreover, the major integration problems were analyzed using relative importance index after the collected data is checked using Cronbach's alpha coefficient. These problems were ranked based on their importance index from an overall and individual parties' perspective. Accordingly, the study indicated that all of the proposed integration problems affect the integration of major construction parties in 13 Addis Ababa 40-60 saving houses of construction projects from all parties' perspective and most of these identified integration problems by individual parties are similar even though more than one integration problems are ranked in the same rank by some individual parties.

Furthermore, the survey study indicated that it is possible to diminish the integration issues if the integration problems identified and managed adequately. For instance, the respondents indicated that sufficient interface management during the decomposition of a project into different contracts, phases, and parties within the presence of many disciplines throughout the whole project life helps to maintain integration among the major construction parties.

Finally, the perceptions of the respondents investigated further with supportive of case study in the following chapter.

5. Case Study Analysis: Result and Discussion

5.1 Introduction

In order to get a better understanding of what major integration problems affect the integration of major construction parties in the governance of Addis Ababa 40-60 saving houses of construction projects in practice, three case study projects were conducted. The practices, as implicated in a real life case, were examined and described in this chapter. First, an interviewee participants' profile is presented. Second, description of the case studies is elaborated including the details of the project organization. Third, the major integration problems occurred in the case study projects of the governance of Addis Ababa 40-60 saving houses of construction projects are identified. Finally, the topmost integration problems causing disintegration among the major construction parties obtained from case study projects are compared with survey data result, and key findings are summarized.

5.2 Overview of the three case study Addis Ababa 40-60 saving of houses of construction projects

5.2.1 Goals of Projects

The projects' goal was completing the numbers of housing units and transferring to the society and creation of job for citizens which contribute to socio-economic development. For this, integrated participation of major construction parties in these projects is essential.

5.2.2 Main project participants and project structure

The main project participants in this project are main contractors, consultants, project client branch offices, and small and micro enterprises. According to the interviewees' opinion, all of these parties executed their works as parts of the project. According to the Addis Ababa 40-60 saving houses enterprise (AASHE) contract administration department, the three case study Addis Ababa 40-60 saving houses of construction projects had a multi-disciplinary character and consists the following deferring entities.

- Addis Ababa saving houses enterprise (Main office),
- Addis Ababa saving houses enterprise branch office,
- Ministry of Urban Development and Housing,
- Consultants,
- Contractors, and

➤ Small and micro-enterprises, and others (i.e, suppliers, financiers).

Generally, the Addis Ababa 40-60 saving houses of construction projects have a typical project structure in other the selected case study projects sites except the number of building blocks and number of assigned human resource, made of up professionals and non-professionals. All the three projects had their own AASHE branch offices, consultants, contractors and governmental regulatory body which looks after the overall progress of projects. Each of Addis Ababa 40-60 saving houses of construction projects' had their own project manager and each building had site engineer, office engineer as well as others workers (foreman, skilled, semi-skilled and non-skilled workers). For instance, the project structure for the Tourist-Negid 40-60 saving houses of construction projects is presented in the diagram 5.1 below.

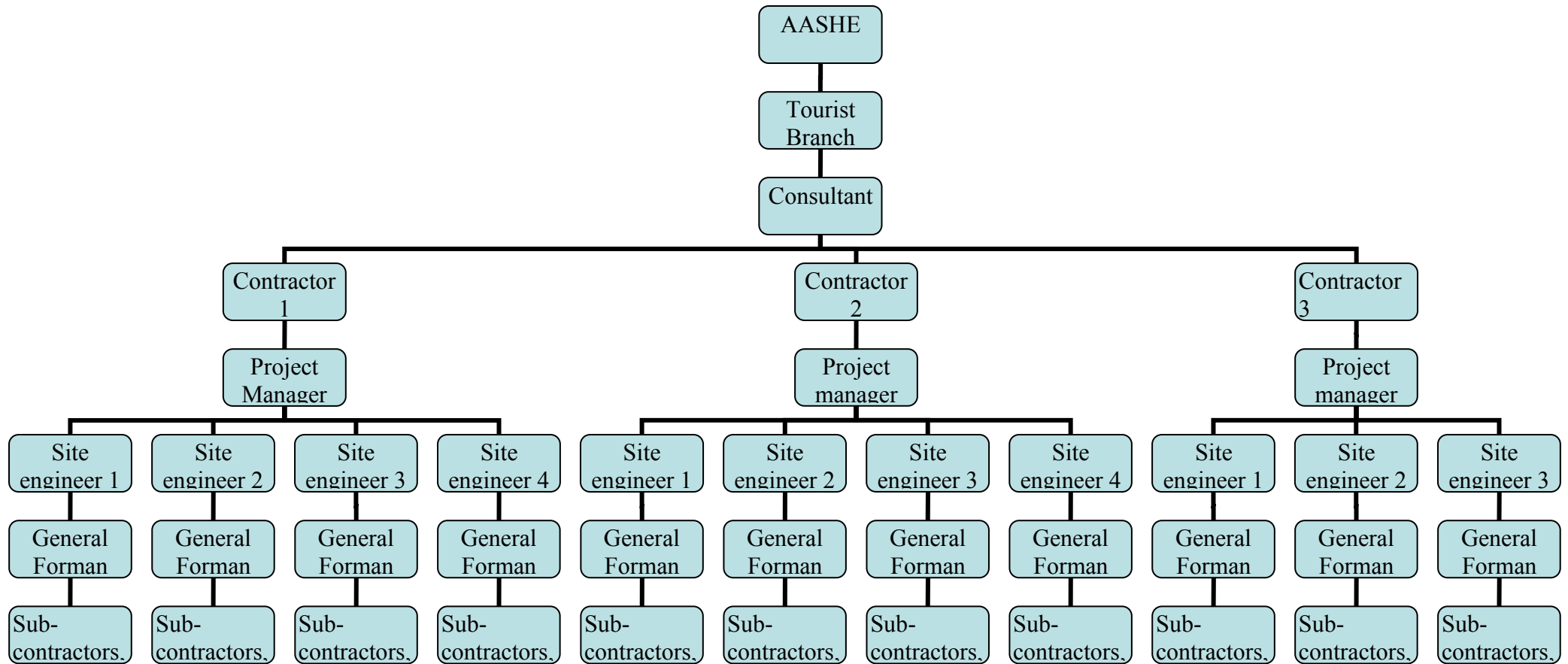


Figure 5. 1: The organizational structure for the Tourist-Negid 40-60 saving houses of construction project.

Note: The project organizational structure for the other 2 remainder case study projects was similar except the number of building blocks, and number of involved professionals and other workers.

5.2.3 Phases of the three case study Addis Ababa 40-60 saving houses of construction projects

Throughout the DBB project delivery process of three case study 40-60 saving houses of construction projects, there were three separate stages that the project went through until it was essentially completed, which were: design, procurement and construction phase.

Design phase

For the case of Addis Ababa 40-60 saving houses of construction projects, the client announced an invitation to consultants; and selected and employed a single consulting party for the design developments of Addis Ababa 40-60 housing of construction projects with different buildings story having identical typology for different project sites. Contractually, this was incorporated to be part of the contract document. Using this typology, the client was awarding the contract for different consulting party for each site for the adaptation (design review) and contract administration of the Addis Ababa 40-60 saving houses of construction projects throughout the project execution phase.

Procurement phase

In the governance of Addis Ababa 40-60 saving houses construction projects, there was an invitation to bidders on newspaper and the bidders submit their qualification to the Ministry of Works, Urban Development and housing. Then, up on the qualification criteria, successful bidders have been selected and signed a contract with the Addis Ababa 40-60 saving housing enterprise based on the fixed unit price set by Ministry of Urban Development and Housing.

Construction phase

The construction process was executed by the participation of selected contractors under the supervision of consulting firm for the project execution. However, the overall project performance coordination and management by the consultant is not good. This implies that the consultants are not discharging their responsibility even though they are assigned in the project in behalf of the client to provide the contract administration service as per the contract time and cost. Moreover, the client has its own project staff controlling the consultant and overall look of the project progress. And due to the failure of coordination for the better performance of projects by the consultant, the client's project staff sometimes enter interference to enhance the parties' project execution better.

5.2.4 Case study projects

The selection of case study projects was based on the stages of projects, complexity of projects (number of building blocks they consisted and number of parties involved) and project parties' integration result obtained from the survey result. Accordingly, the project which was in the earliest stage and on the way of completing were selected to address the issue in all stages of the construction projects. Besides, projects which consisted more number of blocks and more parties involved in the respective construction project was selected to get better information from those parties while they interacted among the more number of parties.

Moreover, according to the result of projects' team integration obtained from the survey, projects ranked 1st and last were selected for the case study in order to get more information both from project parties having relatively better team integration and poor team integration.

As a result, for this research, the following three case study projects were selected from the governance of Addis Ababa 40-60 saving houses of construction projects, as described in the Table 5.1 below.

Table 5. 1: Overview of projects considered for case study (August 2016)

Case No.	Project name	Project area (hectare)	Numbers of building blocks	Contract value (Birr)	Project progress	Duration (Months)
1	Senga-Tera	2.2	5	167,027,828.81	98.14 %	18
2	Tourist-Negid	4.36	11	794,283,670.20	57.5%	19
3	Bole-Ayat one	48.66	133	2,021,371,209.12	51.97 %	15

5.2.4.1 Case study one: Senga-Tera 40-60 housing construction project

This choice was made partly because project was being completed; thus, the project provided an opportunity to observe the three stages of the project (design to construction completion) and presented a convenient sample were present. Besides, the project's team integration result as ranked 3rd according to the survey result; hence it is expected that better information was obtained from this project.



Figure 5. 2: Photos of Senga-Tera 40-60 housing construction projects (Taken on August, 2016)

5.2.4.1.1 Project participants

The main project participants in this project are main contractors, consultant, Addis Ababa 40-60 saving houses, project client branch offices, MoUDH, and small and micro enterprises.

A Study on Problems Affecting the Integration of Major Construction Parties in Design-Bid-Build Project Delivery Method in the Addis Ababa 40-60 Housing Construction Projects

Table 5. 2: Information on the interviewees from Senga-Tera 40-60 housing construction project.

No.	Role of the interviewees (qualification)	Total Years of experience in construction	Years of experience in building	Working company's experience related to housing construction	Company's category	Company's specialization	Years since Company's establishment	Type of company
1	Project Manager (BSc)	10	8	12	BC-1	Building	12	Contractor
2	Project Manager (BSc)	11	9	8	BC-1	Building	8	Contractor
3	Site engineer (BSc)	6	6	10	GC-1	Building	10	Contractor
4	Engineer (BSc)	7	5	more than 20	-	Building	more than 20	Regulatory
5	Site engineer (BSc)	5	4	11	BC-1	Building	11	Contractor
6	Resident engineer (BSc)	10	10	More than 20	CAE-1	General	More than 20	Consultant
7	Project manager (MSc)	6	6	4.5	-	Building	4.5	Client

Most of the project team members (from contractors, consultants, regulatory body and clients) at Senga-Tera 40-60 saving houses of construction projects were interviewed, including the project managers, site engineers and site supervisor as shown in Table 5.1.

5.2.4.1.2 Background: Project information

Senga-Tera 40-60 housing construction project is one of the Addis Ababa 40-60 saving houses of construction projects which is located at 'Senga-Tera' in Kirkos-sub city, central part of Addis Ababa. The project was built on 2.2 hectare (22,000m²). It consisted five building blocks with 2B+G+12 story. According to the information from contract agreements made between contractors and AASHE and from project participants, the type of construction delivery method was DBB and admeasurement contract method set by the Ministry of Works and Urban Development.

Moreover, the project's starting date was on December 29, 2012 with the contractual completion time of 540 calendar days (18 months). However, the project's current status was 98.14 % (August 2016), which showed a delayed by 780 days (144.44%) beyond the contractual completion time. This implied that the involved parties were not responsible for their respective job, and they did not to act on such delay to solve the issues through collaborative effort. This amount of delay might have an effect on the project cost overrun. This is because, the client is paying the cost of supervision for the consultant even though this party is not able to administer the project according to the contract time. Besides, the client also is paying for its project staff beyond the project contract time. Thus, it has an implication on project cost overrun due to the integration problem among the major construction parties even though the effects of integration problems on project cost is not investigated in detail in this study as the researcher recommends for further study.

Regarding the project's structure, Senga-Tera 40-60 housing construction project had its own project structure similar to the project structure shown in the Figure 5.1.

5.2.4.1.3 Project parties' integration among major parties in Senga-Tera 40-60 project

Among the interviewed project participants, one project manager and one site engineer pointed out that, there was a partial integration among the major parties involved in Senga-Tera 40-60 housing construction project whereas the remainder (2 project managers and 2

site engineers) interviewees agreed that there was no collaboration among those involved parties.

From this, the perceptions of the interviewees confirmed and supported the result obtained from the survey data in the previous section (refer to survey data analysis result). In the survey analysis result, Senga-Tera project was ranked 3rd in relation to the parties' integration. For the survey result, it shall be noted that the rank was analyzed within the number of total 40-60 projects in AASHE office. This is because, none of project parties were integrated totally by fulfilling ten dimensions of team integration 100% full integration as shown in Table 2.2 (Baiden et al, 2006). Accordingly, investigation of major integration problems in this case study project from interviewed perspective was conducted in the following section.

5.2.4.1.4 Major integration problems in Senga-Tera 40-60 construction Project

Most interviewed participants agreed that major integration problems which were proposed as the list of 24 integration problems had an impact on the integration of major construction parties. They all pointed out that most of the 24 integration problems affected the integration of major parties in Senga-Tera 40-60 housing projects. However, according to some interviewees, some of the proposed integration problems did not affect the integration of the parties involved in this housing construction project. Among the integration problems, weather condition, geological condition, interpersonal and organizational culture difference, inadequate design information in the contract, inadequate contract and specification, and absence of risk plan by parties were confirmed by some interviewees. In addition to this, most interviewees only indicated that proposed list of integration problems affected integration of parties without providing the detail information for which they based their views. However, some interviewees pointed out the detail information (occurrence, impact and their management mechanism) for the most integration problems which were well thought-out.

In this section, according to the interviewed participants only the most important integration problems which have significant impact and were explained with their detail cause, occurrence phase, their possible consequence and their management method are presented. This implied that each integration problem has different extent of problems even though the

figures (percentage of interviewed) is not exactly calculated. However, according to the interviewed and site observation, major integration problems were presented in the Table 5.3 below.

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Table 5. 3: Major integration problems affecting integration of major parties from interviewees' perspective at Senga-Tera 40-60 housing construction project.

No	Major integration problem/s	Critical cause of problems	Phase/s that problems are occurred	Possible consequence/s	possible management mechanisms
1	Inadequate preparation and planning before commencement of a project	<ul style="list-style-type: none"> • Lack of efficient and long term plan • Losing objective of project (planning in terms of political instead social demand) • Lack of professionals' involvement 	<ul style="list-style-type: none"> • Design and planning • procurement • Construction 	<ul style="list-style-type: none"> • Time delay • Parties' disintegration • Stoppage of work 	<ul style="list-style-type: none"> • Adequate planning with the involvement of qualified professionals in the early stage
2	Lack of integrated planning and scheduling for different contracting parties	<ul style="list-style-type: none"> • Lack of pre-planning and team planning and scheduling experience • Impractical work and resource planning and scheduling (only for advance payment purpose was submitted) 	<ul style="list-style-type: none"> • Design and planning • procurement • Construction 	<ul style="list-style-type: none"> • Time delay • Missing of works • Conflict among parties due to work execution chronological order 	<ul style="list-style-type: none"> • Defining full the scope of works (all and only) • Allow the participation of all parties for integrated planning & scheduling.
3	Lack of personnel, financial and physical resources by owners, contractors and consultants for construction project relative to requirements	<ul style="list-style-type: none"> • Lack of source of fund • Payment delay • Miss use of projects finance to own use • Lack of respect for professionals and unwilling by parties to hire competent professionals 	<ul style="list-style-type: none"> • Design and planning • Procurement phase • Construction phase (most interviewed agreed on this) 	<ul style="list-style-type: none"> • Suspense of works and parties disintegrated • Workers of project's disintegrated and discouraged 	<ul style="list-style-type: none"> • Arranging better financial source and equipment ownership • Employ competent professionals and give respect for them

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No	Major integration problem/s	Critical cause of problems	Phase/s that problems are occurred	Possible consequence/s	possible management mechanisms
4	Poor communication between relevant construction parties	<ul style="list-style-type: none"> Means of communication (only meeting) deal after a month and more Poor competition practices and poor practice of AASHE for awarding new project 	<ul style="list-style-type: none"> design and planning procurement construction phase 	<ul style="list-style-type: none"> No flow of information among project parties which resulted disintegration and result less team work culture. 	<ul style="list-style-type: none"> Create communication platform by which all parties collaborate in more short time Open information access
5	Self-serving objectives; Lack of co-ordination; Lack of trust and reliability among contracting parties; and Disregarding contextual issues	<ul style="list-style-type: none"> Self-serving and satisfying their own need and ignore others Loosing of trust & reliable among teams Disregarding nature and objective of project which has to bring public house demand as to their good effort 	<ul style="list-style-type: none"> design and planning procurement Construction 	<ul style="list-style-type: none"> Mistrust and unreliability resulted disintegration Project output lost Conflict among parties was sometimes seen. 	<ul style="list-style-type: none"> Changing awarding system of new project and evaluating criteria of awarding new project. Building awareness among parties in relation to creation of integration among parties
*6	Uncoordinated and separated parties' involvement (small and micro enterprises)	<ul style="list-style-type: none"> Uncoordinated work schedule to do their job based on the exact time they agreed. Payment was low and were not happy. They came upon the repeatedly call by AASHE not by their motivation 	<ul style="list-style-type: none"> Construction phase 	<ul style="list-style-type: none"> In case of AASHE was absent, the enterprises remained inactive and contractors await performing work. 	<ul style="list-style-type: none"> Jointly coordinated and planned work schedule The enterprises shall be receiving command from main contractors.

Note: * represented additional integration problem obtained from interviewed during site investigation

5.2.4.1.5 Interface among the contracting parties in Senga-Tera 40-60 housing project

Interface is generally considered the link between construction elements, phases, construction parties and different disciplines (Shokri et al, 2012). To enhance better understanding the types of interfaces among the major construction parties, the Senga-Tera 40-60 housing construction project interfaces were categorized and explained to them at three levels (Sebastian, 2014 and Shokri et al, 2012): inter-project interface, intra-project interface and extra-project interface.

Inter-project interface occurred between different parties directly involved in project designing, planning, and execution. According to the interviewees in the Senga-Tera 40-60 construction project, this type of interface existed between contractors, contractors and consultant, project client branch office and contractors, contractors and regulatory body, regulatory body and client which were participated. According to the interviewed participants, this type of interface among contractors, client and consultant was not good due to the integration problem among the major parties. This is confirmed project parties' poor communication and poor interaction as the perception of survey respondents indicated.

On the other hand, intra-project interface was within the organization of each independent party involved in Senga-Tera 40-60 housing construction project. In this type of interface, interfaces occurred by the individuals (staffs, workers and management staff) within a single contractor during the construction phase. However, according to the interviewed parties and site observation; staffs, workers within a single entity was good even though there was misunderstanding and lack of respect among the workers. This implied that staffs and workers faced lack of trust and reliability due to the poor information flow and when one staff tried to influence others in order to show his/her importance than the others to their organization where they were working.

Moreover, extra-project interface also occurred in Senga-Tera 40-60 saving houses of construction project. High government officials and Ministry of Urban Development and Housing observed and commented their suggestion on the parties' performance in relation to project. This shows that in this project the external parties like mentioned above had more interaction with project branch office and AASHE (main office). However, the ministry of

housing and construction had an interaction between contractors and consultants during the selection of project consultants and contractors. However, according to interviewed participants, extra-project interface was not practically productive in Senga-Tera 40-60 housing project. For this, interviewees pointed out that the external parties considered themselves as boss and know everything to control the project parties and in other hand project parties ignore and complain against the external parties.

In conclusion, in Senga-Tera 40-60 housing construction project, the interaction between parties was not fully achieved as mentioned in this section. Interviewees explained that the temporary involvement of different individual parties having different extent of previous experience and new 40-60 construction project exposure created bad interface in Senga-Tera 40-60 housing projects. Thus, the result confirms earliest finding by Sebastiaan (2014), that in construction, integration problem could easily occur due to its uniqueness behavior (i.e., temporary multi-part organization, different parties involve in different and interrelated phases of project) without sufficient interface management (IM). Besides, the non-achievement of ten dimension of team integration conducted in the survey data supported this result; and only some dimensions of team integration were achieved in better way, some partially and remainder dimensions were not totally achieved.

5.2.4.2 Case study two: Tourist-Negid 40-60 housing construction project

This choice was made partly because project was at earliest stage; thus, the project provided an opportunity to observe the practical construction stage and presented a convenient sample were present. Furthermore, according to the survey result, the project's team integration was ranked 1st among the AASHE projects (Addis Ababa 40-60 saving houses projects). Accordingly, it is expected more important information was obtained from this project parties.



Figure 5. 3: Photos of Tourist-Negid 40-60 housing construction projects (Taken on August, 2016).

5.2.4.2.1 Project participants

Similar to the first case study project, the interviewed main project participants were taken from main contractors, consultant and project client branch office.

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Table 5. 4 : Information on the interviewees from Tourist-Negid 40-60 saving houses of construction project.

No.	Role of the interviewees (qualification)	total Years of experience in construction	Years of experience in building	Working company's experience related to housing construction	Company's category	Company's specialization	Years since Company's establishment	Type of company
1	Project Manager (BSc)	8	8	12	BC-1	Building	12	contractor
2	Site Engineer (BSc)	3	3	14	GC-1	General	14	contractor
3	Resident engineer (BSc)	9	7	10	CAE-1	Building	10	consultant
4	Project manager (BSc)	7	7	4.5	-	Building	4.5	Client

Most of the project team members (from contractors, consultant and client) at Tourist Negid 40-60 saving houses of construction projects were interviewed, including the project managers, resident engineer and site engineer as shown in Table 5.4. However, the regulatory body could not found on site when the case study was conducted.

As shown in the Table 5.4, all interviewed participants had an experience more than 6 years and all of the interviewees are project leaders and qualified respondents except one interviewee even though their educational qualification is first degree. This implied that it is expected that they pointed out the practical issues concerning the integration problems among the project teams in this project.

5.2.4.2.2 Back ground Project information

Tourist Negid 40-60 saving houses of construction project was one of the Addis Ababa 40-60 saving houses of construction project which is located at 'Megenagna' area in Bole-sub city, Addis Ababa. The project was built on 4.36 hectare (43,600m²). In this project, there were 11 building blocks. Initially, these building blocks were designed with 2B+G+12 story. However, in later time, it was modified to 2B+G+18 story to create more housing units as the project branch office project manager pointed out.

Besides, according to the project branch manager and information obtained from contract agreements made between contractors and AASHE, the type of construction delivery method was DBB and admeasurement contract method which had been set by ministry of urban development and housing.

Moreover, the project's starting date was on December 30, 2015 with the contractual completion time of 570 calendar days (19 months). However, the project's current status was 57.5 % (until August 2016). However, the progress was expected to be 65.00% at this time. This implied that the project was delayed by 7.5%. In addition to this, this housing construction Project had its own project structure similar to the project structure shown in the Figure 5.1.

5.2.4.2.3 Project parties' integration in Tourist-Negid 40-60 saving houses project

Similar to the Senga-Tera 40-60 saving houses of construction project, the project managers, site engineers and supervisors interviewed pointed out that, there was no collaboration among those involved parties in this project. It is worth mentioning that the interaction among the

involved parties is often based on self-serving interest instead of mutual cooperation. One of the worthless activities observed on site was that one of the contractors was in need of precast which was supplied by AASHE. Accordingly, until this material was supplied by AASHE, the contractor was requesting a cooperation from the other contractor having surplus quantity of precast, which currently was not needed by this contractor. However, the contractor which had surplus precast was not cooperative to lend the precast; and hence the material from this contractor was given by the influence of consultant and project branch office. In the later time the borrowed precast was substituted to the contractor. This implied that parties in this project did not discuss issues associated with the material supply and borrowing of material each other in case of supply shortage by AASHE.

However, the perception of interviewees contradicted with survey analysis result. According to the survey data analysis result, the Tourist-Negid housing project was ranked 1st in terms of project parties' integration among the total number of Addis Ababa 40-60 saving houses of construction projects. At this point, the ranking was performed relative to the total number of projects' team integration not by fulfilling the full level of achievement of dimensions of team integration stated by Baiden B. et al (2006). This is because none of 10 dimensions of team integration was achieved fully (100%) in this 40-60 housing construction project. However, the interviewees pointed out the collaboration practices facing integration problems practically on the construction site among the involved parties in this project instead relative to the other projects' team integration. Thus, the interviewees in depth response on the actual construction projects more likely match to the role active players, the interviewees.

5.2.4.2.4 Identification of integration problems in the Tourist-Negid 40-60 saving of houses of construction Project

According to the interviewed, they all agreed that among 24 listed integration problems 8 integration problems (presented in the table 5.5) affected the integration of major parties severely (with their details: cause, consequence, phase of projects they occurred and possible management), 10 problems were medium scale problems (only problems are accepted by all interviewees without justification) whereas the remainder 5 problems (weather condition, geological condition, interpersonal and organizational culture difference, inadequate design information in the contract, inadequate contract and specification; and absence of risk plan by

parties) were indicated as integration problems by only two interviewees in Tourist-Negid 40-60 saving houses project. Moreover, the interviewees added other additional one integration problems in addition to the proposed integration problems by the research.

However, similar to the Senga-Tera 40-60 saving houses project, most interviewed pointed out the detail information for some integration problems which they believed important 9 integration problems and having sufficient reason in due considering. This implied that most interviewed confirmed that all problems affect the smooth integration among the major parties. However, some interviewed pointed out with detail information (occurrence, impact and their management mechanism) for the most integration problems which they well thought-out.

Thus, the summary of each integration problems which were pointed out according to the interviewed participants were presented in the summary Table 5.5. Table 5.5 shows the problems identified in the Tourist-Negid 40-60 housing construction project including their detail information.

Table 5. 5: Major integration problems affecting integration of major parties from interviewees' perspective at Tourist-Negid saving houses of construction project.

No	Major integration problem/s	Critical cause of problems	Phase/s that problems are occurred	Possible consequence/s	possible management mechanisms
1	Lack of commitment by involved parties	<ul style="list-style-type: none"> • Negligence by parties • Low payment to parties • Lack of awareness 	<ul style="list-style-type: none"> • During planning and procurement • Construction 	<ul style="list-style-type: none"> • Time delay • Quality compromised 	<ul style="list-style-type: none"> • Jointly planning and discussion • Building awareness
2	Lack of integrated planning and scheduling for different contracting parties	<ul style="list-style-type: none"> • Lack of defining scope of work items (all and only) Impractical work scheduling (only for advance payment purpose was submitted/ no action) • Lack of building integrated team to prepare practical integrated planning and scheduling including all parties did not know when they perform their job clearly. 	<ul style="list-style-type: none"> • Design and planning procurement • Construction 	<ul style="list-style-type: none"> • Loosing of parties' integration & time delay • Conflict among parties due to less chronological work order which result disintegration of parties 	<ul style="list-style-type: none"> • Defining full the scope of works (all and only) • Building collaborative • Jointly planning based on multi-party's work schedule • Be responsible to their work as per schedule
3	Lack of personnel, financial & physical resources by owners, contractors & consultants for construction project relative to requirements	<ul style="list-style-type: none"> • Lack of source of fund • Payment delay • Miss use of projects finance to own use • Lack of access to equipment ownership • Lack of skilled professional due to low salary 	<ul style="list-style-type: none"> • Construction phase (most interviewed agreed on this) 	<ul style="list-style-type: none"> • Suspense of works and parties disintegrated due to resigning of capable professionals and financial resources 	<ul style="list-style-type: none"> • Arrange better financial source • Paying good salary and provide incentives for professionals

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No	Major integration problem/s	Critical cause of problems	Phase/s that problems are occurred	Possible consequence/s	possible management mechanisms
4	Poor communication between relevant construction parties	<ul style="list-style-type: none"> • poor method of communication; and poor communication among relevant parties; and being keeping information on their as secret to others 	<ul style="list-style-type: none"> • Design, procurement and construction 	<ul style="list-style-type: none"> • Disintegration among project teams • Losing of project team integration 	<ul style="list-style-type: none"> • Create communication platform by which all parties collaborate
5	Self-serving objectives; Lack of co-ordination; Lack of trust and reliability among contracting parties; and Disregarding contextual issues	<ul style="list-style-type: none"> • Loosing of trust and reliable among teams • Disregarding nature and objective of project which has to bring public house demand as to their good effort 	<ul style="list-style-type: none"> • design and planning procurement • Construction 	<ul style="list-style-type: none"> • Mistrust and unreliability resulted disintegration • Conflict among parties was sometimes seen. 	<ul style="list-style-type: none"> • Creating awareness about creation of integration among parties and building trust among parties
6	Lack of clearly defined responsibility of each contracting party in the contract for the project	<ul style="list-style-type: none"> • Absence each party's specific responsibility incorporated in the contract • Lack of attention by the client with respect to parties' collaboration effort; and Lack of expert in the AASHE to prepare consistent responsibility of each contracting party in the contract provision 	<ul style="list-style-type: none"> • Planning and procurement (most parties agree on the planning) • Construction 	<ul style="list-style-type: none"> • Parties missed their responsibility and performed their job carelessly • Time delay • Conflict among parties 	<ul style="list-style-type: none"> • Incorporate all scopes of parties' responsibility in the contract • Being responsible for their service / works as per the contract

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No	Major integration problem/s	Critical cause of problems (in detail)	In which phase occurred	Possible consequence/s	How it could be managed
7	Bureaucratic client organization and greater process and administrative rules and regulations	<ul style="list-style-type: none"> • Bureaucratic, poor attention and slow decision for the requested issues from parties • Bureaucratic procedure to get services in site and decisions were not left to the branch office. 	<ul style="list-style-type: none"> • procurement phase • Construction phase 	<ul style="list-style-type: none"> • Time delay and contractors went every consecutive day to get the decision • Parties lose their motive to work 	<ul style="list-style-type: none"> • Assigning excellent decision maker permanently at the project branch office serve the customers' issues
8	Lack of knowledge by the client about project processes and integration issues, and inadequate technical skill by the client	<ul style="list-style-type: none"> • Failure to apply of construction management process approach • Leaders are not technically educated; they are not construction management professionals to manage the projects 	<ul style="list-style-type: none"> • Design & planning • Procurement • Client's top management • Construction 	<ul style="list-style-type: none"> • No technical direction for parties • No input for parties from top management of client 	<ul style="list-style-type: none"> • Client's top management positions shall be professionals • Apply construction management approach
*9	Uncoordinated and separated parties' involvement (small and micro enterprises)	<ul style="list-style-type: none"> • Uncoordinated work schedule to do their job • Payment was low & were not happy. They came upon the repeatedly call by AASHE not by their motivation 	<ul style="list-style-type: none"> • Construction phase 	<ul style="list-style-type: none"> • In case of AASHE was absent, small and micro enterprises remained inactive & contractors await without work. 	<ul style="list-style-type: none"> • The small & micro enterprises shall be hired under the major contractors to manage properly

Note: * represents additional integration problem obtained from interviewees during site investigation

5.2.4.2.5 Interface in Tourist 40-60 saving houses of construction projects

Practically, due to the nature of AASHE projects (different parties made an agreement in similar project location and managed by single project branch office and consultant for the temporary time), there was an interface (link between parties) (Chen et al., 2006). According to the interviewed participants, they explained that the interaction (link between different parties) was not encouraging to create better team working environment instead they be afraid of each other. They added that the link between different parties was not based on the mutual cooperation instead for their obligatory interest purposely.

According to two of the project managers and three site engineers, the issue was coming from strong competition between contracting parties. The performance of each party was evaluated and ranked accordingly; and the AASHE will award the best performing contractor another project while the least performer will not be awarded. As a result, each party tried to safeguard its interest for timely completion to get extra project even without concerning for the quality of project. According to them, this created a negative relationship among the contractors. The client's project branch manager confirmed that contractors were expected and competed with each other even though they did not cooperate with each other which caused the loss of positive interaction and performance of the overall project.

Moreover, there was no chain of command among the parties. The information flow among the parties and within a single party was not as shown in the organizational structure, figure 5.1. According to the parties' opinion, the parties' chain of command was not based on professionalism. This implied that information could flow randomly with loss of trust from respective person. It is worth mentioning that owner of Contractor Company was asking information from guards (losing trust from his staff) and a client asked information from contractor related to consultant.

The project managers and engineers however agreed that this was a serious problem. And they explained that without having sufficient information about the consultant, the client claimed on the consultant and the information obtained was false, there was a personal conflict and resulted loss of trust on the interaction of different parties. Besides, one of the project manager of contractors added that the staff of single entity was purposely found the default of other staff using the other entity's staff and judge by presenting said information. This implied that the project parties staffs of within a single entity relationship was not

established based on the dimensions of team integration stated by Baiden et al (2006) and most of cases explained that integration is not achieved among the major construction parties in Tourist-Negid 40-60 housing project.

5.2.4.3 Case study three: Bole-Ayat one 40-60 saving houses of construction project

The rationale to select the Bole-Ayat one 40-60 saving houses of construction project was due to the complexity of the site. This is because this project consisted more number of building blocks and more parties were involved (there are 4 project lots and consisted many more number of parties involved in these project lots); and hence it is expected that more information was obtained from this project parties facing complex issues about integration problems. In addition to this, the choice was made partly because the project's team integration achievement was ranked last relative to the total number of Addis Ababa 40-60 saving houses of construction projects as the survey analysis result indicated. Thus, it is also expected that issues related to integration problems were pointed out by the interviewees.



Figure 5. 4: Photos of Bole Ayat one 40-60 saving houses of construction project (on August, 2016).

5.2.4.3.1 Project participants

Similar to the previous two case study projects, the main project interviewed participants in this project were main contractors, consultants and project client branch office from which interviewees were participated.

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Table 5. 6: Information on the interviewees from Bole-Ayat one 40-60 housing construction projects.

No	Role of the interviewees (qualification)	total Years of experience in construction	Years of experience in building	Working company's experience related to housing construction	Company's category	Company's specialization	Years since Company's establishment	Type of company
1	Site engineer (BSc)	7	6	12	BC-1	Building	12	contractor
2	Site Engineer (BSc)	5	5	10	GC-1	General	10	contractor
3	Project Manager (BSc)	8	7	11	GC-1	Building	11	contractor
4	Site Supervisor (BSc)	6	6	4.5	-	Building	4.5	Client
5	Project Manager (BSc)	13	8	12	BC-1	Building	12	contractor
6	Site Engineer (BSc)	3	3	14	GC-1	General	14	contractor
7	Engineer (BSc)	7	7	More than 20	-	Building	More than 20	regulatory
8	Resident engineer (BSc)	7	9	10	CAE-1	Building	10	Consultant
9	Site Supervisor (BSc)	4	4	8	CAE-1	Building	8	Consultant
10	Project manager (BSc)	7	7	4.5	-	Building	4.5	Client

In Bole Ayat one 40-60 saving houses of construction project, professionals from project team members (from contractors, consultants, client and regulatory body) were interviewed, including the project managers, resident engineer, site supervisors, site engineers and regulatory body's engineer as shown in Table 5.6. As shown in the table 5.6, all interviewed participants had experience in building construction. This implied that they forwarded better opinion concerning integration problems in Bole-Ayat one 40-60 saving houses construction project.

5.2.4.3.2 Back ground Project information

Bole-Ayat one 40-60 housing construction project is built on 48.66 hectare (48,660m²) located at 'Ayat' area, Addis Ababa. Among the total Addis Ababa 40-60 saving houses of construction projects owned by AASHE, this shared the biggest project in volume and amount consisting B+G+7, B+G+9 and 2B+G+12 with the number of blocks 80, 35 and 18 respectively.

Similar to the Tourist-Negid and Senga-Tera 40-60 saving houses of construction projects, the type of construction delivery method was DBB and admeasurement contract method. In addition to this, this housing construction project had its own project structure similar to the project structure shown in the Figure 5.1.

Moreover, the project's starting date was on June 10, 2014 with the contractual completion time of 450 calendar days (15 months). However, the project's current status is 51.97 % and took 750 days (until August 2016). However, the progress was expected to be 100% and start providing service at this time. This implied that the project was delayed by 66.6%.

5.2.4.3.3 Project parties' integration in Bole-Ayat one 40-60 housing project

Unlike to the previous two case study projects, more number of participants including project managers, site engineers and supervisors (from Bole-Ayat one 40-60 saving houses project) were interviewed during the case study. Accordingly, they pointed out that there was no collaboration among those involved parties in the three lots. However, in the remainder 1 lot of this branch housing project, they pointed out that there was partial integration among the project teams.

They added that the project's branch and all project lots' project parties were not integrated and claimed as each tried to safe guard their own individual interest. According to the

interviewees from all four lots of projects there was no integration among the project teams due to integration problems suggesting different factors. They confirmed that there was a contractors' committee representing them to deal and requesting common issues with AASHE office and its project branch. However, three project managers and 2 site engineers agreed that some individual parties tried to get their own requested issues approved by leaving committee approach. This implied that the interaction among the involved parties is often based on self-serving interest instead mutual cooperation. When it was compared with survey result, the integration of parties was ranked at 13th, last from the total number of housing construction projects. Therefore, the case study result supported the perceptions of survey data respondents that there was no integration among the major construction parties in Bole-Ayat one 40-60 saving houses of construction project.

5.2.4.3.4 Identification of major integration problems in Bole-Ayat one construction Project

According to the interviewed poor communication among parties, lack of commitment by parties, bureaucratic client organization and greater process and administrative rules and regulations, lack of creating integrated single project team with all members located together in a project, inadequate preparation and planning before commencement of a project, lack of knowledge by the client about project processes and integration issues and inadequate technical skill by the client, lack of personnel and financial and physical resources by owners, contractors and consultants for construction project relative to requirements, Self-serving objectives; lack of co-ordination; lack of trust and reliability among contracting parties; and disregarding contextual issues, and lack of integrated planning and scheduling for different contracting parties were identified by interviewees and supported with their cause and consequence among the 24 integration problems whereas weather condition, geological condition, interpersonal and organizational culture difference, inadequate design information in the contract, inadequate contract and specification, and absence of risk plan by parties were identified as integration problems by one interviewee in Bole-Ayat 40-60 saving houses of construction projects. However, the remainder problems were confirmed that they affected the integration of major parties. But, the interviewees did not present a detail information to these problems.

Moreover, the interviewed added that the number of project's division into lots and the administration of these four lots managed by one project branch increased the disintegration among the parties. This was due to the overlapping of problems and questions raised by requesting parties and loss of timely response to these parties. This implied that most interviewed confirmed that all problems affect the smooth integration among the major parties. However, some interviewed pointed out some integration problems with detail information (occurrence, impact and their management mechanism) for the most integration problems which were found to be similar to the Senga-Tera and Tourist 40-60 saving houses construction projects as shown in the Table 5.7.

Integration problems identified by the interviewees in the Bole-Ayat one 40-60 saving houses of construction project were summarized including their causes, impacts and possible mitigation as shown in the Table 5.7.

A Study on Problems Affecting the Integration of Major Construction Parties in Design-Bid-Build Project Delivery Method in the Addis Ababa 40-60 Housing Construction Projects

Table 5. 7: Major integration problems affecting integration of major parties from interviewees’ perspective Bole-Ayat one housing construction project

No	Major integration problem/s	Critical cause of problems (in detail)	In which phase occurred	Possible consequence/s	How it could be managed
1	Lack of commitment by involved parties	<ul style="list-style-type: none"> • Negligence by parties • Low payment to parties • Lack of awareness 	<ul style="list-style-type: none"> • During planning and procurement • Construction 	<ul style="list-style-type: none"> • Time delay • Quality compromised 	<ul style="list-style-type: none"> • Jointly planning and discussion • Creating awareness
2	Inadequate preparation and planning before commencement of a project	<ul style="list-style-type: none"> • Lack of efficient and long term plan • lack of detail investigation and feasibility study • lack of adequate planning 	<ul style="list-style-type: none"> • Design and planning • procurement 	<ul style="list-style-type: none"> • Time delay • Stoppage of work during construction 	<ul style="list-style-type: none"> • Jointly pre-planning • Paper work should be completed 100%
3	Lack of integrated planning and scheduling for different contracting parties	<ul style="list-style-type: none"> • Lack of defining scope of work items • Impractical work, resource planning & scheduling • Lack of building integrated team to prepare practical integrated planning and scheduling including all parties to perform their job clearly. 	<ul style="list-style-type: none"> • Design and planning • procurement • Construction 	<ul style="list-style-type: none"> • Time delay • Missing of works 	<ul style="list-style-type: none"> • Developing detail planning and scheduling
4	Poor communication between relevant construction parties	<ul style="list-style-type: none"> • Poor competition practices and poor practice of AASHE for awarding new project 	<ul style="list-style-type: none"> • design & planning • procurement • construction 	<ul style="list-style-type: none"> • Losing information among parties 	<ul style="list-style-type: none"> • Create communication platform by which all parties collaborate

A Study on Problems Affecting the Integration of Major Construction Parties in Design-Bid-Build Project Delivery Method in the Addis Ababa 40-60 Housing Construction Projects

No	Major integration problem/s	Critical cause of problems	Phase/s that problems occurred	Possible consequence/s	management mechanisms
5	Lack of personnel, financial and physical resources by owners, contractors and consultants for construction project relative to requirements	<ul style="list-style-type: none"> • Lack of source of fund • Lack of access to equipment ownership • Lack of skilled professional due to low salary 	<ul style="list-style-type: none"> • Design and planning • Procurement phase • Construction phase 	<ul style="list-style-type: none"> • Suspense of works and parties disintegrated • quality of works was affected 	<ul style="list-style-type: none"> • Arranging better financial source and Equipment ownership • Paying good salary and provide incentives for professionals
6	Poor communication between relevant construction parties	<ul style="list-style-type: none"> • Poor competition practices and poor practice of AASHE for awarding new project 	<ul style="list-style-type: none"> • design & planning • procurement • construction 	<ul style="list-style-type: none"> • Losing information among parties 	<ul style="list-style-type: none"> • Create communication platform by which all parties collaborate
7	Self-serving objectives; Lack of co-ordination; Lack of trust & reliability among contracting parties; and Disregarding contextual issues	<ul style="list-style-type: none"> • Self-serving and satisfying their own need and ignore others • Loosing of trust and reliable among teams • Disregarding nature and objective of project which has to bring public house demand as to their good effort 	<ul style="list-style-type: none"> • design and planning • procurement • Construction 	<ul style="list-style-type: none"> • Mistrust and unreliability resulted disintegration • Project output lost 	<ul style="list-style-type: none"> • Changing awarding system of new project and evaluating criteria of awarding new project.

A Study on Problems Affecting the Integration of Major Construction Parties in Design-Bid-Build Project Delivery Method in the Addis Ababa 40-60 Housing Construction Projects

No	Major integration problem/s	Critical cause of problems	Phase/s that problems occurred	Possible consequence/s	management mechanisms
8	Bureaucratic client organization and greater process and administrative rules and regulations	<ul style="list-style-type: none"> • Bureaucratic, poor attention and slow decision for the requested issues from parties • Bureaucratic procedure to get services in site. Discrimination was a big problem due to illegal incentive by some parties for store persons for queuing and getting material • Authorized personnel were not found at their office. 	<ul style="list-style-type: none"> • procurement phase • Construction phase 	<ul style="list-style-type: none"> • Time delay • Contractors was feeling bored & losing their moral due to long time waiting & went every consecutive day to get the decision 	<ul style="list-style-type: none"> • Assigning excellent decision maker/personnel permanently to serve the customers' issues
*9	Uncoordinated and separated parties involvement (small and micro enterprises)	<ul style="list-style-type: none"> • Uncoordinated work schedule to do their job based on the exact time they agreed. • Payment was low and were not happy. They came upon the repeatedly call by AASHE not by their motivation • Major parties could not order instead command came from AASHE. 	<ul style="list-style-type: none"> • Construction phase 	<ul style="list-style-type: none"> • Disintegration and work out put lost 	<ul style="list-style-type: none"> • Discussion about fee for those enterprises The enterprises shall be receiving command from main contractors

A Study on Problems Affecting the Integration of Major Construction Parties in Design-Bid-Build Project Delivery Method in the Addis Ababa 40-60 Housing Construction Projects

No	Major integration problem/s	Critical cause of problems	Phase/s that problems occurred	Possible consequence/s	management mechanisms
10	Lack of knowledge by the client about project processes and integration issues, and inadequate technical skill by the client	<ul style="list-style-type: none"> • Failure to apply of construction management process knowledge • Top management of client was not led by professionals knowing construction management 	<ul style="list-style-type: none"> • planning • Procurement • Client's top management • Construction 	<ul style="list-style-type: none"> • Expect output only from parties; no direction resulting quality problem • Slow decision due to less professional sensitivity for parties' resulting time delay 	<ul style="list-style-type: none"> • Client's top management positions shall be led by professionals • Apply construction management approach & direct parties
*11	More number of project's division into lots and the administration of these lots managed by one project branch office	<ul style="list-style-type: none"> • Uncoordinated work schedule to do their job based on the exact time they agreed. • More questions raised from all lots and timely response was delayed. • Lack of capable client at the project branch to serve the involved parties timely. • Enterprises were not coordinated and came in phone call by clients and contractors while they performed their assigned parts of works 	<ul style="list-style-type: none"> • Construction phase 	<ul style="list-style-type: none"> • Stoppage of work until requested issues were identified in all lots Conflict between staffs of major parties • At that moment parties disintegrated 	<ul style="list-style-type: none"> • Assign independent project branch office • Hire capable personnel who serve and address issues requested by parties • Develop integrated work schedule practice.

Note: * represented additional integration problem obtained from interviewed during site investigation

5.2.4.3.5 Interface in Bole-Ayat one 40-60 saving houses of construction projects

Similar to the Senga-Tera and Tourist 40-60 housing construction projects, there was an interaction with different parties (inter-project interface) and within the single entity's staff and workers (intra-project interface). In addition to this, different parties were also interacting with the external government body such as with regulatory body looking 40-60 housing construction project.

However, most of the parties pointed out that, the interaction of parties either with different parties or within their staff was not good. According to three of the project managers and three site engineers and resident engineer, the issue was coming from strong competition between contracting parties and the negligence of parties. They explained that performance of each part was evaluated and the AASHE will award other project to those best performing parties while the least performer will not be awarded. As a result, each party tried to safeguard its interest for timely completion to get extra project even without concerning for the quality of project.

Moreover, there was no a chain of command among the parties. The information flow among the parties and within a single party was random instead of the expected flow as shown in 5.1 organization structure similar to Senga-Tera 40-60 housing project.

5.2.5 Comparison and summary of case study projects result

From the table 5.3, 5.5 and 5.7, it was learnt that most of the integration problems obtained from the three case study projects were similar. However, at the Tourist-Negid and Bole Ayat one (big size) housing construction projects, more numbers of integration problems were identified. In all of three case study projects, the integration problems which have severe effect were identified with their detail information (cause, phase occurred and consequence) by interviewees.

Accordingly, in the case of Senga-Tera and Tourist-Negid housing construction projects, there were 6 and 9 integration problems identified respectively. Whereas there were 11 integration problems were identified in the case of Bole Ayat one project. Most of the identified integration problems were similar in all the case study projects. For instance, ‘Self-serving objectives; lack of co-ordination; lack of trust and reliability among contracting parties; and disregarding contextual issues’, ‘poor communication between or among the major construction parties’, ‘lack of personnel, financial and physical resources by owners, contractors and consultants for construction project relative to requirements’, ‘lack of integrated planning and scheduling’, and ‘uncoordinated and separated parties involvement’ were 5 common integration problems identified in all three case study projects. However, ‘inadequate preparation and planning before commencement of a project’ was existed in the case of Senga-Tera housing project and in the Bole Ayat one whereas ‘lack of commitment of individual parties’, ‘lack of knowledge by the client about project processes and integration issues and inadequate technical skill by the client’, and ‘bureaucratic client organization and greater process and administrative rules and regulations’ were identified as integration problem in the case of Tourist-Negid housing project and in the Bole Ayat one as shown in the Table 5.3, 5.5 and 5.7. For the case of Bole-Ayat one 40-60 housing construction project, all of the integration problems identified in the two case study projects were existed. Furthermore, ‘more number of project’s division into lots and the administration of these lots managed by one project branch office’ affected the integration of major parties in Bole-Ayat one 40-60 housing construction project.

Moreover, more number of project’s division into lots and the administration of these lots managed by one project branch office, and uncoordinated and separated parties’ involvement

(small and micro enterprises) were two additional integration problems identified in the three case study projects but not found in the survey result. From these two integration problems, the former was identified by three case study projects while the later one was only identified in the Bole Ayat one 40-60 saving houses of construction project. According to the interviewees, these two additional problems occurred during the interaction of parties with each other while they performed their job.

In view of that, even though common integration problems were existed in the three case study projects, interviewees pointed out different supporting perceptions for some integration problems concerning causes, possible consequences and possible management mechanisms as shown the Table 5.3, 5.5 and 5.7. This implied that there were different reasons in the three housing construction projects contributing to the same integration problems affecting integration of major construction parties.

In conclusion, there were common and particular integration problems affecting the integration of major construction parties in the three case study projects. Accordingly, it was learnt that there was poor interaction among the contracting parties due to the existence of these integration problems while they interacted each other at the construction sites. Thus, enhancing teams' collaboration and the existence of better interface (interaction between parties) among the involved parties is essential.

5.2.6 Interface management (IM) among the major contracting parties

According to the interviewees, IM was not practiced in all three case study projects. However, they pointed out that IM shall be implemented in order to create better working environment. Accordingly, project managers, site engineers and supervisors agreed that identifying the type of interface and parties' responsibility with respect to their interface issue throughout the project phases could enabled good interface among project parties. They added that there must be mutual agreement among all project participants in relation to their interface responsibility and indicate the sensitivity of project which caused problem for the socio-economical demand from perspective of the public housing need in the city, if the project failed to do so. This finding result confirmed

with the previous study by Shokri et al (2012) and Chen et al (2007) that IM helps to effectively identify and handle interfaces which cause integration problems through the whole project lifecycle with the objectives of facilitating the alignment process among the major construction parties by defining the interface characteristics and responsibilities of involved parties in the construction projects.

5.2.7 Comparison of case study result with survey study results

The case study projects were examined in the actual construction sites with active participation of the interviewees as integration problems were presented in the Table 5.3, 5.5, and 5.7 for the Senga-Tera, Tourist Negid and Bole Ayat one respectively. From the Table 5.3, 5.5, and 5.7 above, it was learnt that the integration problems obtained from the three case study projects were matched in survey result. However, in the survey result, the ranking was performed using the figures (numbers); and in the case study projects, the integration problems which have severe effect were identified with their detail information (cause, phase occurred and consequence).

Consequently, most of the integration problems identified in the case study were similar to the problems identified by the survey study as shown in the Table 5.3, 5.5, and 5.7. Among the top ten integration problems identified by survey study were agreed by interviewees in the case study.

Accordingly, most of the top integration problems identified by survey study (from overall parties' perspective) were supported by detail investigation in the case study projects. For instance, self-serving objectives; lack of co-ordination; lack of trust and reliability among contracting parties; and disregarding contextual issues, poor communication between or among the major construction parties, lack of commitments of the individual parties, bureaucratic client organization and greater process and administrative rules and regulations and lack of resources owned by different parties like personnel, physical and financial sources were supported by interviewees in the case study. However, all the integration problems identified in the three case study projects were matched when compared with the problems identified in the survey study by individual parties' and overall parties' perspective.

Moreover, in the case study projects, there were two additional integration problems identified in one of the case study projects (Bole Ayat one): more number of project's division into lots and the administration of these lots managed by one project branch office, and uncoordinated and separated parties' involvement (small and micro enterprises). This implied that the involvement of these uncoordinated and separate small and micro enterprises affected the integration of major construction parties. They explained that these enterprises were not coordinated and came in phone call by clients and contractors while they performed their assigned parts of works (installation of electrical and sanitary works; and production of hollow concrete block, precast materials).

According to the interviewees, these two problem occurred during the interaction of parties with each other while they performed their job. Thus, even though the numbers of problems identified with the detail information was smaller than the integration problems identified by survey study, the problems were investigated with limited numbers of case study projects (three case study projects among from 13 construction projects) existed in the case study projects.

Therefore, it has been learned from the results of both case study and survey study, these integration problems were similar and consistent with most of previous studies (Sebastiaan, 2014; Chen *et al*, 2006; La hart, 2007; Huang *et al*, 2008; and Rahman and Kumaraswamy, 2005). This is because most of the proposed integration problems are mapped based on the previous studies as shown in the methodology part section 3.5 (Table 3.1) for further study. Thus, this study results contributed as a basis to conduct detail investigation on management mechanisms of integration problems affecting the integration of major construction parties in the Addis Ababa 40-60 saving houses of construction projects and similar construction projects in the future.

6. Conclusion and Recommendation

This chapter presents conclusions from the study by combining the research results from both case study and survey study based on the objectives mentioned on section 1.3 of the introduction chapter. Accordingly, in this chapter the main conclusions for this research are summarized. Recommendations will also be forwarded to improve integration among the major construction parties for the better collaboration of their effort so as to create integrated construction parties to perform the Addis Ababa 40-60 construction projects and similar projects better in the future.

6.1 Conclusion

By conducting this research and answering the research questions throughout the thesis, several conclusions have been extracted. The research carried out has shown integration problems affecting integration of construction parties in the Addis Ababa 40-60 saving houses construction projects.

Integration among the construction parties in Addis Ababa 40-60 saving houses of construction projects is not achieved among all parties to mobilize their collaborative efforts and maintain harmonious collaboration throughout the project life, in order to ensure value for money and optimize usage of their resources. As such, various integration problems were identified, in order to avoid these integration problems and to enhance integration among the major construction parties in the future. Data was collected from different parties working in the Addis Ababa 40-60 saving houses of construction projects and was analyzed; and case study was conducted. Results led to the following observations:

1. Design-bid-build (DBB) project delivery method was used for the mechanism of project awarding in Addis Ababa 40-60 saving houses of construction projects. All these housing construction projects passed through the three separate stages: design, bid and construction phase. In this project delivery, the construction project phases were divided in different segments for different major parties which were involved in each phases.
2. Accordingly, in this separated stages of Addis Ababa 40-60 housing construction projects, there were different parties involved in the execution of each different segments. This includes the clients, consultants, contractors, regulatory body. In addition, small and micro enterprises, which

are sublet for the production of hollow and ribbed block, precast and installation of electric and sanitary works, are participated in the Addis Ababa 40-60 housing construction projects. In practice, there is usually no contracting relationship between the small and micro enterprises; and their interaction with contractors and consultants was not specified in the contract to take the coordination responsibilities.

3. The parties involved in the Addis Ababa 40-60 saving houses of construction projects believe that there is high level of fragmentation and disintegration among the major parties involved in the projects in the application of design bid build (DBB) contractual procedure by the saving houses enterprise due to the effects of unintegrated processes/stages among these major parties.
4. Some parties like the consultant are not discharging their responsibility. It is a failure of consultants that they left the coordination responsibility to the client. They missed the coordination responsibility which affect the parties integration and overall performance of Addis Ababa 40-60 saving houses of construction projects.
5. Most of the parties were aware of the concepts of integration issues in the DBB delivery method and whereas very few were not aware of integration issues for the case of Addis Ababa 40-60 saving houses of construction projects.
6. The level of integration among the major construction parties were different for the case of 13 Addis Ababa 40-60 saving houses of construction projects. Among the overall thirteen Addis Ababa 40-40 saving houses of construction projects Tourist-Negid, Bole-Summit and Senga-Tera projects achieved better level of construction parties' integration respectively whereas Hinsta-Akrabi, Meri-Loke and Bole-Ayat one achieved the least integration respectively. However, the level of integration achieved in all construction projects was not totally fragmented and no totally integrated; and there are integration problems causing disintegration obtained in this study.
7. From the study, 24 integration problems were identified in the survey study, and they were ranked from overall perspective and individual parties' perspective. From the overall perspective, the top ten integration problems identified in this study are;
 - Self-serving objectives; lack of co-ordination; lack of trust and reliability among contracting parties; and disregarding contextual issues,

- Poor communication between or among the major construction parties,
- Lack of knowledge by the client about the project processes and integration issues, and inadequate technical skill by the client,
- Lack of commitments of the individual parties,
- Inadequate preparation and planning before commencement of a project,
- Lack of clearly defined responsibility of each contracting party in the contract for the project,
- Lack of personnel, financial and physical resources by owners, contractors and consultants for construction project relative to requirements,
- Lack of creating integrated single project team with all members located together in a project,
- ‘Bureaucratic client organization and greater process and administrative rules and regulations,
- Technical incompetence and limited personal experience of contractor, and
- Lack of integration management among the contracting parties by the clients’.

Moreover, the analysis also indicated that most of the parties shared most of the top ten integration problems with respect to the overall view even though the ranking was different from the individual parties’ perspective.

8. In addition to integration problems identified in the survey study, ‘Uncoordinated and separated parties involvement’ and ‘more number of project’s division into lots and the administration of these lots managed by one project branch office’ were additional two problems identified in case the case study as major integration problems. Moreover, ‘Lack of commitments of parties’, ‘inadequate preparation and planning’, ‘poor communication and poor coordination among the parties’, ‘self-serving objective and lack of trust and reliability among parties’, ‘inadequate resource by parties’, ‘bureaucratic client organization and time-consuming procedure’ and ‘lack of knowledge by the client’ to manage the projects efficiently are the major problem areas identified in the case study. Accordingly, most of these integration problems identified in the case study and the survey study are matched; hence from this study, it is concluded that these integration problems were affecting the

integration of parties involved in the Addis Ababa 40-60 saving houses of construction projects.

9. Due to the multi-party involvement nature of the Addis Ababa 40-60 saving houses of construction projects, there existed an interface (interaction between parties) among each individual parties. However, most parties believed that there was no good interface between the construction parties as due to the existed integration problems.
10. Most of the survey respondents agreed that it is possible to improve the existed integration problems of major construction parties and some of these recommend possible solutions. Besides, from the case study, some interviewees recommend possible management mechanisms for major integration problems that they agreed.

6.2 Recommendation

After the conducted research presented in this thesis, recommendations can be derived for Addis Ababa 40-60 saving houses of construction projects concerning the integration improvement among the major construction parties involved in this project. These recommendations could be taken into account to diminish integration issues in Addis Ababa 40-60 saving houses of construction projects. The recommendations derived are the following from the investigation undertaken on the research.

A. Expected from all parties

1. Developing construction parties' team work culture and collaborate parties' effort.
All the parties involved in the construction of Addis Ababa 40-60 saving houses of construction projects shall develop the team work culture and collaborate their effort to enhance mutual benefit and attain high level of team integration to perform the project in better way.
2. All involved parties shall take into account their contractual responsibilities.
When the several parties get involved in the Addis Ababa 40-60 saving houses of construction projects, they should make sure that all involved parties share the same objectives and goals for the project as a whole. It was generally mentioned in the case study and in the survey study that some parties are victim of self-serving objectives, lack of coordination, and lack of trust and reliability among contracting parties towards the final result.

Thus, all the major parties should carefully consider their responsibilities while executing the project and all parties shall be coordinated each other.

3. All main stakeholders shall be involved throughout all phases of projects to derive coordination responsibility as a collaboration means.

All major construction parties shall participate throughout the phases of construction projects starting in the early design and planning phase to develop a process everyone can work with, believes in, and therefore, is more likely to work together. This is because understanding the importance of the process, as well as a commonly accepted method, is critical to create a climate in where everyone participates proactively starting in the early phase of project.

B. Expected from the Addis Ababa 40-60 saving houses enterprise

4. Building integration parties' platform and build awareness.

The Addis Ababa saving houses of enterprise (40-60 saving houses enterprise) shall establish the common platform to build construction parties' integration. The office also shall treat each contracting parties equally and timely; and develop awareness about the parties' collaboration effort for the success of project performance by preparing training.

5. Identifying and incorporate the interface (interaction of parties) in the contract.

Since interface existed (interaction between parties) among the major construction parties, there should be a clearly identified interference limit for each contracting parties in the contract.

6. Take time to evaluate projects, and develop lessons learned for the next projects' use.

More time should be spending to the evaluation of executed projects and lessons learned should be developed. In addition, for each Addis Ababa 40-60 saving houses of construction projects, a clear decomposition including the works, parties assigned in specific work and contractual responsibilities and interfaces of all parties should be collected in a record. This is because by keeping a record, the client is able to see in advance what objects make part of a project, what their parties' integration problems are, and what the high parties' collaboration effort be in the next project. This will further building the collaboration among all the involved parties throughout the process of project to attain projects' efficiency for the future.

C. Expected from the regulatory body

7. The regulatory should ensure and promote the construction parties' integration parallel to the following up of the Addis Ababa 40-60 saving houses of construction projects. For instance, the office shall develop the manual showing the positive interaction of involved parties, prepare training and conducting workshop for involved parties to build awareness about integration.

6.3 Suggestions for Future Study

This study tried to substantiate integration problems affecting the integration of major construction parties in the Addis Ababa 40-60 saving houses of construction projects. The researcher believes a further work on this area is vital in order to guide the Addis Ababa 40-60 saving houses of construction projects through the efficient use of collaboration efforts of involved parties.

1. The assessment of impact of integration problems in the Addis Ababa 40-60 saving houses of construction projects in DBB project delivery.

In this study, major integration problems were identified; hence, the impact of these integration problems on both project parties and performance of 40-60 saving houses of projects and similar projects shall be investigated in the future.

2. A study on the effect of integration of parties on the performance of Addis Ababa 40-60 saving houses of construction projects particularly time, cost and quality perspective.
3. Study of the treatment mechanisms of integration problems affecting the integration of involved construction parties in the Addis Ababa saving houses of construction projects. This shall be in related to diminishing the integration problems among the parties to enhance parties' integration in DBB delivery method.
4. Study the interface (interaction) management of contracting parties' responsibility. The interaction between two or more parties is existed due to the existence of contract agreement between parties in DBB delivery method. Thus, the interfaces in each phase of project for each party among the major construction parties clearly in DBB delivery method shall be studied.

5. Studying possible technological methods employed to enhance integration among the parties in the Addis Ababa 40-60 saving houses of construction projects. For instance, Building Information Modeling (BIM) and other technological methods that shall be applicable to create team integration in AASHCP shall be investigated in DBB delivery method.
6. Comparing the international practice of parties' integration with the Ethiopian parties' integration practice. Investigating the way of achievement of international practice of construction parties' integration like UK construction companies and others' trend and develop for Ethiopian construction companies to establish the level of their integration achievement in DBB delivery method.

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Appendix A - Questionnaire

PREFACE

I wish to thank you for your participation in this research. The questionnaire you are about to complete forms part of these research for a **Master of Science in Civil engineering (construction Technology management major)**. This research is being done to study major integration problems which affect the integration of major construction parties (client, consultant and contractor) in the case of city governance of Addis Ababa 40-60 saving houses of construction projects by which building accommodation is provided.

SUGGESTIONS FOR COMPLETION OF QUESTIONNAIRE

1. Please note that your response is anonymous and will be treated in absolute confidentiality.
2. The questionnaire comprises five Sections (SECTION 1, 2, 3, 4 and 5) and would take approximately 25 to 30 minutes to complete.
3. Where applicable, definitions of terms and specific assumptions are included to facilitate your response.
4. Should your company or organization wish to receive a copy of the final research report, you are welcome to write to **Mr. Gebrehana Tadesse; phone +251 913942906; Email: Gebrehanaderbe46@gmail.com.**

Introduction

Project delivery system from the construction perspective is an overall processes by which a project is designed, constructed, and/or maintained. For this research, the traditional (design-bid-build/DBB) project delivery method is emphasized and typically involves three sequential project phases: the design phase, which requires the services of a designer who will design the project; the bid phase, when a contractor is procured; and a build or construction phase, when the project is built by the contractor. In this delivery method, integration among the construction parties is challenging for the realization of construction project due to its sequential project processes practically.

For this research, **integration** is simply defined as bringing all of these construction participants involved in executing of a construction process or processes to work together while having a common goal and unified culture.

On the other hand **interface** is generally considered the link between construction elements, phases, construction parties and different disciplines.

According to different researches, smooth integration among the major construction parties plays a very important role in achieving project objectives in any construction project. The integration of project teams involved starting from the inception phase of the project enable projects to have better performance. Thus, in this research, the researcher intends to study major problems affecting the integration of major construction parties (clients, consultants and contractors) in the case of city governance of Addis Ababa saving houses of construction project (40/60 housing program) to enhance integration in the future similar project.

Objectives of the research:

- To know the level of teams (major construction parties) integration in design bid build project delivery method for the case of city governance of Addis Ababa 40-60 saving houses of construction projects.
- To **study major integration problems** among the major construction parties in design-bid-build project delivery method for the case of city governance of Addis Ababa 40-60 saving houses of construction projects.
- To **identify the most critical integration problems** among the major problems.

➤ To forward possible recommendations and conclusions.

Advisor: Dr. Abraham Assefa Tsehaye

This research is conducted for academic purposes, so please try to fill it carefully and truthfully.

INDICATE YOUR ANSWER APPROPRIATELY AND ACCORDINGLY.

SECTION 1-PERSONAL AND ORGANIZATIONAL PROFILE OF RESPONDENT

1.1 Name of Organization (Optional): _____

1.2 Type of Organization: Client/Employer Consultant Contractor
 Regulatory body (MoWUD) other (Please specify) _____

1.3 Year/s since your company's/organization's establishment: _____

1.4 Organization's area of specialization:

Building General Contractor other (Please specify) _____

1.5 Organization's/ company's category: 1 2 3 4 5 Other (Please specify)

1.6 Company's/organization's year/s work experience in Addis Ababa 40-60 saving houses of construction projects/and similar building construction project related works: _____

1.7 Your personal year/s of experience

In the construction industry: _____

In building construction projects and Addis Ababa saving houses of construction projects related works: _____

1.8 Please indicate your highest formal qualification:

PHD Master Bachelor Diploma other (please specify) _____

1.9 Your Name, title and contact address:

Name (Optional): _____ Job Title: _____

Contact address (Optional): _____

E-mail (Optional): _____ Tel (Optional): _____

SECTION 2-GENERAL QUESTIONS

2.1 Name of project in which you are/were involved: _____

I. Project name: _____

- II. project starting date: _____
- III. contractual completion date: _____
- IV. stage of project (% completed): _____
- V. Client representative name: _____

2.2 Which type of project delivery used for the case of Addis Ababa 40-60 saving houses of construction projects in which you are/were involved?

- Traditional/design-bid-build (DBB) Design-build (DB) construction management (CM) Integrated project delivery (IPD)
- private public partnership (PPP/P3) other (please specify) _____

Are you aware of integration issues among the major construction parties that you involved?

- Yes No

2.3 Integration among the major construction parties is critical for smooth communication and coordination among individual parties to execute the project accordingly. Do you feel there is a smooth integration among these parties in the case of city governance of Addis Ababa 40-60 saving houses of construction projects?

- Strongly Agree Agree Disagree Strongly Disagree

SECTION 3-Level of team integration

3.1) Please indicate the level of teams (major construction parties) integration practice in the case of city governance of Addis Ababa 40-60 saving houses of construction projects that you are/were involved based on the ten (10) dimension of team integration; and please select using a tick mark (✓) under the three levels of team integration dimensions (i.e., fully achieved, partial achieved, or not achieved).

A Study on Problems Affecting the Integration of Major Construction Parties in Design-Bid-Build Project Delivery Method in the Addis Ababa 40-60 Housing Construction projects

Dimensions of team integration	Ten (10) dimensions of team integration		LEVEL OF INTEGRATION		
			Full achievement	Partial achievement	No achievement
	1	Single team focus and objective	All members have the same focus and work together towards team objectives	Members pursue individual objectives but in line with the overall project objective	Individually pursued objectives by members without regard or in isolation to others and project objectives
	2	Seamless operation with no organizational defined boundaries	Members form a new single project team with no individual member identity or boundaries	Members operate as individuals but make efforts to collaborate with others on the project	Continued alignment and relationship to individual organizations that make up the project team
	3	Mutually beneficial outcome	Pursuance and attainment of project goals that benefits all	Attainment of project goals in conjunction with other members whose involvement are necessary	Individually defined project objectives without compromise or consideration to others need
	4	Increased time and cost predictability	Openly accessible design and construction cost information gathering and management	Systematic follow up of design and construction cost information	Disjointed design and construction costs information gathering and application
	5	Unrestricted cross-sharing of information	Availability and access to all project information to all parties	Access to project information by a section or sections of the project team	Project information only available to members with responsibility for the section of work
	6	Team flexibility and responsiveness to change	Requisite personnel join and leave the project team as their skills are no longer required or are needed	Retention of members no longer required and trained to adopt new requirement	Use of the same project team members even when they had outlived their effectiveness
	7	Creation of single and co-located team	A single project team with all members located together in a common office	Individually operated sub-teams but co-located within a single office environment	Individually located and operated teams
	8	Equal opportunity for project inputs	Consultation of members for contribution at all phases of project before decisions are made	Contributions are welcomed but not noticeably invited from members in making decision on the projects	Little attempt to consult members in key project decision-making processed
9	Equitable team relationships and respect for all	All members are treated as having equal and significant professional capability needed on the project	Recognition of professional competence, but mainly in their respective field of expertise	Team members contribution restricted to their functional restricted to their functional project role	
10	No blame culture	Collective identification and resolution of problems .Collective responsibility for all project outcome.	Cooperation of team members in resolving problems, but with ultimate responsibility resting with a single party	Individual members are singled out for problems that occur on out for problems that occur on corrective measure	

SECTION 4-INTEGRATION PROBLEMS

4.1) Please rank the important major integration problem/s which affect the integration among the major construction parties (clients, consultants and contractors) in the case of city governance of Addis Ababa 40-60 saving houses of construction projects based **on their extent/degree of problems**; and please indicate the other important integration problems (if any) in this questionnaire based on the indicated ordinal testing scale of measurement 1 (not at all a problem), 2 (minor problem), 3(moderate problem), 4(serious problem).

No	Major problem/s which affect the integration of major construction parties in the case of city governance of Addis Ababa saving houses of construction project (40/60 housing program)	Degree/extent of integration problem/s			
		1	2	3	4
1	Lack of commitment by involved parties				
2	Unwilling and unenthusiastic participation of contracting parties				
3	Inadequate preparation and planning before commencement of a project				
4	Lack of integrated planning and scheduling for different contracting parties				
5	Lack of personnel, financial and physical resources by owners, contractors and consultants for construction project relative to requirements				
6	Lack of knowledge by the client about project processes and integration issues, and inadequate technical skill by the client				
7	Technical incompetence and limited personal experience of consultant				
8	Technical incompetence and limited personal experience of contractor				
9	Poor communication between relevant construction parties				
10	Insufficient design communication between consultant and owner				
11	Self-serving objectives; lack of co-ordination; Lack of trust and reliability among contracting parties; and disregarding contextual issues				
12	Lack of creating integrated single project team with all members located together in a project				

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No	Major problem/s which affect the integration of major construction parties in the case of city governance of Addis Ababa 40-60 saving houses of construction projects	Degree/Extent of integration problem/s			
		1	2	3	4
13	Lack of clearly defined responsibility of each contracting party in the contract for the project				
14	Inadequate design information in the contract: Lack of working drawing and poor design information				
15	Inadequate contract and specification: poorly written contract and poor contract method				
16	Lack of modern contracting system among construction parties (such as partnering)				
17	Bureaucratic client organization and greater process and administrative rules and regulations				
18	Lack of integration management among the contracting parties by the clients				
19	Lack of involvement of contractor in design development phase				
20	Interpersonal and organizational culture difference				
21	lack of strong, professionally experienced and responsible client				
22	Geological conditions				
23	weather conditions on site				
24	Absence of any risk reward plans for different parties				
	Any other problems not list (if any): Attach additional pages, if necessary				

SECTION 5-Possible Recommendations (Optional)

5.1) Is there any possible recommendation for integration problems in your company/organization to enhance alignment and coordination among the major construction parties in the case of city governance of Addis Ababa 40-60 saving houses of construction projects to enhance integration for the future similar project?

yes No

5.2) if your answer is yes, what is/are the most important possible recommendation/s to improve the odds of project teams (major construction parties) integration being achieved in the case of city governance of Addis Ababa 40-60 saving houses of construction projects to enhance integration for the future similar project?

5.3) Do you recommend interface management system helps to solve the existing integration problems in the case of city governance of Addis Ababa saving houses of construction project (40/60 housing program)? yes No

5.4) If your answer is yes, how it could be used to improve the odds of project teams (major construction parties) integration being achieved in the case of city governance of Addis Ababa saving houses of construction project (40/60 housing program)?

Thank you very much again for your time.

Gebrehana Tadesse Derbe

Email: Gebrehanaderbe46@gmail.com, Mobile: 0913942906

Appendix B – Case study Interview Questions

PREFACE

I wish to thank you for your participation in this research. The interview you are about to answer questions part of these research for a **Master of Science in Civil engineering (Construction Technology and Management major)**. This research is being done to study major integration problems which affect the integration of major construction parties (client, consultant and contractor) in the case of city governance of Addis Ababa 40-60 saving houses of construction projects by which building accommodation is provided.

ORIENTATION AND INTRODUCTION FOR PARTICIPANTS IN RELATION TO THE INTERVIEW QUESTIONS:

1. First of all, I would like say thank you for your valuable time and cooperation to answer the following interview questions.
2. Please note that your response is anonymous and will be treated in absolute confidentiality.
3. The interview comprises some questions and would take approximately 25 to 30 minutes to complete.
4. Should your company or organization wish to receive a copy of the final research report, you are welcome to contact **Mr. Gebrehana Tadesse; phone +251 913942906; Email: Gebrehanaderbe46@gmail.com.**

Interview Questions

- 1.10** Name of Organization (Optional): _____
- 1.11** Type of Organization: Client/Employer Consultant Contractor
 Regulatory body (MoWUD) other (Please specify) _____
- 1.12** Year/s since your company's/organization's establishment: _____
- 1.13** Organization's area of specialization:
 Building General Contractor other (Please specify) _____
- 1.14** Organization's/ company's category: 1 2 3 4 5 Other (Please specify) _____
- 1.15** Company's/organization's year/s work experience in Addis Ababa housing construction projects (40/60 housing program) /and similar building construction project related works: _____
- 1.16** Your personal year/s of experience
In the construction industry: _____
In building construction projects and Addis Ababa 40-60 saving houses of construction projects and related works: _____
- 1.17** Please indicate your highest formal qualification:
 PhD Master Bachelor Diploma other (please specify) _____
- 1.18** Your Name, title and contact address:
Name (Optional): _____ Job Title: _____
Contact addresses (Optional): _____
E-mail (Optional): _____ Tel (Optional): _____
- 2.4** Back ground /Project Description (Detail information): _____
- I. Project name: _____
- II. Project location: _____
- III. Project number of participants: _____
- IV. Project structure and interactions in different project stages among the major parties: _____
- V. Responsibility of major parties for various stages : _____
- VI. Number of Blocks: _____

A Study on Problems Affecting the Integration of Major Construction Parties in Design-Bid-Build Project Delivery Method in the Addis Ababa 40-60 Housing Construction projects

- VII. Project contract delivery method and contract type:_____
- VIII. Project starting date:_____
- IX. Contractual completion date:_____
- X. Stage of project (% completed):_____
- XI. Others (from interviewee during discussion)

2.5 Do you feel there is a smooth integration among the major construction parties in the Addis Ababa 40-60 saving houses of construction projects you have involved?

Yes No

3.1) Please identify the existence of the following **integration problems in your project. For identified problems, please discuss the details behind the problems and the effect on the project perform**

A Study on Problems Affecting the Integration of Major Construction Parties in Design-Bid-Build Project Delivery Method in the Addis Ababa 40-60 Housing Construction projects

No	Major problem/s which affect the integration of major construction parties in Addis Ababa 40-60 saving houses of construction projects (proposed problems)	Check (Yes/No)	Critical cause of problems (in detail)	In which phase occurred	Possible consequence/s (Time, Cost, Claims, etc.)	How it could be managed
1	Lack of commitment by involved parties					
2	Lack of integration management among the contracting parties by the clients					
3	Inadequate preparation and planning before commencement of a project					
4	Lack of integrated planning and scheduling for different contracting parties					
5	Lack of personnel, financial and physical resources by owners, contractors and consultants for construction project relative to requirements					
6	Lack of knowledge by the client about project processes and integration issues, and inadequate technical skill by the client					
7	Technical incompetence and limited personal experience of consultant					
8	Technical incompetence and limited personal experience of contractor					
9	Poor communication between relevant construction parties					
10	Insufficient design communication between consultant and owner					
11	Self-serving objectives; lack of co-ordination; Lack of trust and reliability among contracting parties; and disregarding contextual issues					

A Study on Problems Affecting the Integration of Major Construction Parties in Design-Bid-Build Project Delivery Method in the Addis Ababa 40-60 Housing Construction projects

No	Major problem/s which affect the integration of major construction parties in Addis Ababa 40-60 houses of construction projects (proposed problems)	Check (Yes/No)	Critical cause of problems (in detail)	In which phase occurred	Possible consequence/s (Time, Cost, Claims, etc.)	How it could be managed
12	Lack of creating integrated single project team with all members located together in a project					
13	Lack of clearly defined responsibility of each contracting party in the contract for the project					
14	Inadequate design information in the contract					
15	Inadequate contract and specification					
16	Lack of modern contracting system among construction parties (such as partnering)					
17	Bureaucratic client organization and greater process and administrative rules and regulations					
18	Unwilling and unenthusiastic participation of contracting parties					
19	Lack of involvement of contractor in design development phase					
20	Interpersonal and organizational culture difference					
21	lack of strong, professionally experienced and responsible client					
22	Geological conditions					
23	weather conditions on site					
24	Absence of any risk reward plans for different parties					
25						
26						

4.3) Briefing on interface and interface management

Interface is generally considered the link between construction elements, phases, construction parties and different disciplines (Shokri et al, 2012).

IM is considered as the process of managing communications, responsibilities and coordination of project parties, phases, or physical entities which are interdependent. It is an ongoing process and should be considered dynamic throughout the life of project with the goal of maintaining the balance between scope, time, cost, quality, and resources (Chen et al., 2006).

In construction, integration problem could easily occur due to its uniqueness behavior (i.e., temporary multi-part organization, different parties involve in different and interrelated phases of project) without sufficient interface management system (IMS) (Sebastiaan, 2014). Accordingly, management of interfaces starts with the identification of the interfaces. Interfaces are considered either internal (within a single contract or scope of work) or external (between contracts or scopes of work) (Chen et al, 2009). To address all types of interfaces, the project interfaces are categorized at three levels (Sebastiaan, 2014; and Shokri et al, 2012)): inter-project interface, intra-project interface and extra-project interface.

Thus, addressing integration problems which affect the interaction of these parties and its effect in the case of Addis Ababa housing construction projects is important.

Question

#1 what is/are the type/s interfaces you faced in the case of Addis Ababa 40-60 saving houses of construction project?

#2 How IMS can be used to improve the odds of project teams (major construction parties) integration being achieved in the case of governance of Addis Ababa 40-60 saving houses of construction projects?

#3 other opinion about the integration problem affecting the integration of construction parties and /possible recommendation in Addis Ababa 40-60 saving houses of construction projects? (If any).

A Study on Problems Affecting the Integration of Major Construction Parties in Design-Bid-Build Project Delivery Method in the Addis Ababa 40-60 Housing Construction projects

Thank you very much again for your time!!!

A Study on Problems Affecting the Integration of Major Construction Parties in Design-Bid-Build Project Delivery Method in the Addis Ababa 40-60 Housing Construction projects

Appendix C –Analysis results of Cronbach's coefficient

A. Cronbach’s coefficient for the contractors

No.	RESPONDEN TS	VALUES GIVEN FOR EACH INTEGRATION PROBLEMS																								Total
		Pr1	Pr2	Pr3	Pr4	Pr5	Pr6	Pr7	Pr8	Pr9	Pr10	Pr11	Pr12	Pr13	Pr14	Pr15	Pr16	Pr17	Pr18	Pr19	Pr20	Pr21	Pr22	Pr23	Pr24	
1	contractor 1	3.0	2.0	3.0	3.0	4.0	2.0	4.0	3.0	4.0	4.0	3.0	2.0	3.0	4.0	3.0	3.0	2.0	2.0	4.0	2.0	2.0	2.0	3.0	3.0	70.00
2	contractor 2	4.0	3.0	4.0	3.0	3.0	4.0	3.0	2.0	3.0	3.0	4.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	3.0	2.0	4.0	2.0	1.0	4.0	73.00
3	contractor 3	4.0	4.0	2.0	2.0	3.0	3.0	2.0	3.0	2.0	4.0	4.0	4.0	4.0	3.0	4.0	2.0	2.0	4.0	3.0	2.0	2.0	1.0	1.0	4.0	69.00
4	contractor 4	3.0	2.0	4.0	2.0	2.0	3.0	3.0	3.0	3.0	4.0	2.0	2.0	3.0	3.0	3.0	4.0	3.0	3.0	4.0	2.0	3.0	2.0	1.0	2.0	66.00
5	contractor 5	4.0	3.0	4.0	4.0	4.0	4.0	2.0	4.0	3.0	3.0	4.0	2.0	4.0	2.0	3.0	2.0	4.0	3.0	4.0	2.0	4.0	2.0	1.0	3.0	75.00
6	contractor 6	2.0	2.0	2.0	2.0	2.0	4.0	3.0	3.0	4.0	4.0	3.0	3.0	3.0	3.0	4.0	4.0	3.0	3.0	2.0	2.0	1.0	3.0	1.0	4.0	67.00
7	contractor 7	3.0	2.0	4.0	2.0	3.0	3.0	4.0	3.0	4.0	3.0	3.0	3.0	4.0	4.0	3.0	3.0	4.0	2.0	3.0	2.0	4.0	2.0	1.0	3.0	72.00
8	contractor 8	3.0	3.0	3.0	3.0	3.0	4.0	3.0	3.0	2.0	3.0	3.0	4.0	3.0	3.0	4.0	3.0	3.0	3.0	4.0	2.0	3.0	2.0	1.0	4.0	72.00
9	contractor 9	3.0	3.0	4.0	3.0	3.0	3.0	4.0	2.0	3.0	4.0	4.0	4.0	2.0	2.0	3.0	4.0	2.0	3.0	4.0	3.0	3.0	2.0	1.0	2.0	71.00
10	contractor 10	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0	3.0	2.0	4.0	2.0	4.0	3.0	3.0	3.0	3.0	2.0	3.0	2.0	1.0	2.0	69.00
11	contractor 11	3.0	3.0	4.0	4.0	4.0	4.0	3.0	4.0	3.0	3.0	2.0	3.0	4.0	4.0	4.0	4.0	2.0	2.0	3.0	3.0	3.0	3.0	4.0	3.0	79.00
12	contractor 12	4.0	3.0	3.0	3.0	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	2.0	4.0	2.0	2.0	2.0	3.0	2.0	1.0	3.0	74.00
13	contractor 13	3.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0	3.0	2.0	4.0	2.0	3.0	3.0	4.0	4.0	4.0	2.0	4.0	4.0	3.0	3.0	82.00
14	contractor 14	4.0	2.0	2.0	2.0	3.0	4.0	4.0	3.0	4.0	3.0	4.0	4.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	1.0	3.0	67.00
15	contractor 15	3.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0	2.0	3.0	4.0	3.0	4.0	3.0	3.0	2.0	4.0	2.0	3.0	3.0	3.0	3.0	1.0	1.0	74.00
16	contractor 16	4.0	3.0	4.0	3.0	3.0	3.0	4.0	2.0	3.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	4.0	2.0	2.0	3.0	2.0	3.0	2.0	75.00
17	contractor 17	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	2.0	3.0	3.0	4.0	4.0	4.0	2.0	4.0	2.0	3.0	3.0	1.0	2.0	3.0	3.0	69.00
18	contractor 18	3.0	3.0	4.0	4.0	4.0	4.0	3.0	3.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	1.0	4.0	78.00
19	contractor 19	3.0	4.0	4.0	4.0	4.0	3.0	2.0	4.0	2.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0	3.0	3.0	84.00
20	contractor 20	4.0	3.0	4.0	4.0	4.0	4.0	3.0	4.0	3.0	3.0	2.0	3.0	2.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	1.0	3.0	74.00
21	contractor 21	4.0	3.0	3.0	3.0	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	1.0	3.0	86.00
22	contractor 22	3.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	3.0	2.0	3.0	3.0	4.0	3.0	3.0	2.0	2.0	2.0	4.0	2.0	2.0	3.0	1.0	2.0	59.00
23	contractor 23	3.0	3.0	4.0	2.0	3.0	3.0	3.0	4.0	4.0	2.0	4.0	3.0	3.0	3.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0	2.0	2.0	77.00
24	contractor 24	4.0	2.0	4.0	4.0	4.0	3.0	4.0	4.0	4.0	3.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0	2.0	3.0	3.0	3.0	2.0	1.0	3.0	79.00
25	contractor 25	2.0	4.0	2.0	2.0	2.0	4.0	3.0	4.0	3.0	4.0	3.0	3.0	2.0	3.0	3.0	3.0	4.0	3.0	2.0	2.0	3.0	1.0	3.0	3.0	68.00
26	contractor 26	4.0	4.0	4.0	3.0	3.0	4.0	4.0	3.0	4.0	2.0	4.0	4.0	4.0	2.0	2.0	4.0	4.0	4.0	3.0	1.0	3.0	2.0	3.0	3.0	78.00
27	contractor 27	4.0	4.0	4.0	4.0	4.0	3.0	4.0	4.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0	4.0	3.0	3.0	3.0	3.0	1.0	4.0	86.00
28	contractor 28	2.0	2.0	2.0	2.0	2.0	4.0	3.0	4.0	4.0	4.0	3.0	4.0	2.0	3.0	3.0	2.0	4.0	3.0	2.0	3.0	3.0	3.0	1.0	2.0	67.00
29	contractor 29	4.0	2.0	3.0	3.0	3.0	4.0	4.0	3.0	4.0	2.0	4.0	3.0	4.0	2.0	2.0	4.0	4.0	4.0	4.0	1.0	3.0	2.0	2.0	3.0	74.00
30	contractor 30	3.0	3.0	2.0	2.0	2.0	4.0	3.0	3.0	2.0	3.0	4.0	4.0	4.0	3.0	2.0	3.0	2.0	3.0	4.0	2.0	2.0	1.0	1.0	3.0	65.00
31	contractor 31	4.0	2.0	2.0	2.0	2.0	3.0	4.0	2.0	3.0	4.0	4.0	3.0	4.0	2.0	3.0	2.0	3.0	4.0	3.0	4.0	3.0	2.0	2.0	3.0	70.00
32	contractor 32	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	4.0	2.0	3.0	4.0	4.0	4.0	4.0	2.0	4.0	2.0	4.0	3.0	2.0	2.0	2.0	2.0	69.00
33	contractor 33	3.0	3.0	3.0	3.0	3.0	4.0	3.0	2.0	4.0	2.0	4.0	4.0	4.0	3.0	2.0	3.0	3.0	4.0	4.0	2.0	3.0	2.0	1.0	3.0	72.00
34	contractor 34	4.0	3.0	4.0	2.0	2.0	3.0	2.0	2.0	2.0	4.0	4.0	4.0	2.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	3.0	3.0	67.00
35	contractor 35	3.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0	2.0	3.0	2.0	4.0	2.0	2.0	4.0	3.0	3.0	2.0	2.0	2.0	3.0	3.0	72.00
36	contractor 36	4.0	4.0	2.0	2.0	2.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0	4.0	2.0	4.0	4.0	4.0	3.0	3.0	2.0	3.0	3.0	4.0	3.0	79.00
37	contractor 37	2.0	2.0	4.0	4.0	4.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	2.0	3.0	4.0	4.0	2.0	2.0	2.0	2.0	2.0	1.0	61.00
38	contractor 38	3.0	4.0	4.0	3.0	3.0	3.0	3.0	2.0	4.0	3.0	3.0	4.0	4.0	3.0	4.0	3.0	4.0	3.0	3.0	4.0	4.0	3.0	1.0	3.0	78.00
39	contractor 39	4.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0	3.0	87.00
14 item-level		0.44	0.55	0.68	0.63	0.55	0.46	0.40	0.59	0.53	0.57	0.47	0.55	0.52	0.55	0.50	0.58	0.67	0.60	0.54	0.68	0.69	0.45	0.94	0.54	13.67
		variance associated with the total score																								43.62
		Cronbach coefficient																								0.7165

Pr=Problem

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B. Cronbach's coefficient for regulatory bodies

No.	RESPONDENT S	VALUES GIVEN FOR EACH INTEGRATION PROBLEMS																								Total
		Pr1	Pr2	Pr3	Pr4	Pr5	Pr6	Pr7	Pr8	Pr9	Pr10	Pr11	Pr12	Pr13	Pr14	Pr15	Pr16	Pr17	Pr18	Pr19	Pr20	Pr21	Pr22	Pr23	Pr24	
1	Regulatory body	4.0	3.0	3.0	4.0	4.0	4.0	3.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0	3.0	3.0	3.0	1.0	2.0	2.0	76.00
2	Regulatory body	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	4.0	3.0	4.0	3.0	3.0	4.0	2.0	2.0	3.0	86.00
3	Regulatory body	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0	3.0	3.0	4.0	4.0	1.0	2.0	3.0	85.00
	3 item-level	-	0.33	0.33	-	-	-	0.33	0.33	-	-	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	-	0.33	0.33	0.33	-	0.33	5.33
		variance associated with the total score																								30.33
		Cronbach coefficient																								0.8600
		Pr=problem																								

C. Cronbach's coefficient for the consultants

No.	RESPONDENTS	VALUES GIVEN FOR EACH INTEGRATION PROBLEMS																								Total
		Pr1	Pr2	Pr3	Pr4	Pr5	Pr6	Pr7	Pr8	Pr9	Pr10	Pr11	Pr12	Pr13	Pr14	Pr15	Pr16	Pr17	Pr18	Pr19	Pr20	Pr21	Pr22	Pr23	Pr24	
1	consultant 1	4.00	2.00	4.00	4.00	4.00	3.00	3.00	4.00	4.00	3.00	4.00	1.00	4.00	2.00	3.00	4.00	4.00	4.00	4.00	4.00	2.00	2.00	2.00	4.00	79.00
2	consultant 2	3.00	4.00	3.00	3.00	3.00	3.00	2.00	3.00	4.00	2.00	4.00	3.00	3.00	3.00	3.00	3.00	2.00	4.00	4.00	3.00	3.00	2.00	1.00	2.00	70.00
3	consultant 3	2.00	3.00	2.00	3.00	4.00	4.00	3.00	4.00	4.00	4.00	3.00	3.00	2.00	3.00	3.00	2.00	4.00	4.00	2.00	3.00	3.00	3.00	3.00	4.00	75.00
4	consultant 4	4.00	3.00	3.00	4.00	4.00	4.00	4.00	3.00	4.00	2.00	4.00	3.00	4.00	2.00	2.00	4.00	4.00	4.00	3.00	1.00	4.00	2.00	2.00	3.00	77.00
5	consultant 5	3.00	2.00	4.00	2.00	4.00	4.00	3.00	4.00	2.00	3.00	4.00	2.00	3.00	3.00	2.00	3.00	3.00	3.00	4.00	2.00	3.00	1.00	1.00	1.00	66.00
6	consultant 6	4.00	3.00	3.00	2.00	3.00	3.00	4.00	2.00	3.00	4.00	4.00	3.00	4.00	2.00	1.00	1.00	3.00	4.00	3.00	4.00	4.00	2.00	2.00	1.00	69.00
7	consultant 7	2.00	3.00	2.00	4.00	2.00	2.00	2.00	3.00	4.00	2.00	3.00	3.00	2.00	3.00	1.00	2.00	4.00	3.00	2.00	3.00	2.00	2.00	2.00	2.00	60.00
8	consultant 8	4.00	4.00	4.00	2.00	2.00	4.00	3.00	2.00	4.00	2.00	4.00	3.00	4.00	2.00	2.00	3.00	3.00	4.00	4.00	1.00	4.00	2.00	1.00	3.00	71.00
9	consultant 9	4.00	2.00	4.00	4.00	3.00	3.00	2.00	4.00	2.00	4.00	4.00	3.00	2.00	2.00	3.00	3.00	2.00	2.00	2.00	2.00	1.00	3.00	2.00	65.00	
10	consultant 10	3.00	3.00	2.00	3.00	4.00	4.00	3.00	4.00	3.00	3.00	2.00	3.00	2.00	4.00	3.00	1.00	4.00	4.00	3.00	3.00	3.00	2.00	2.00	3.00	71.00
11	consultant 11	4.00	3.00	3.00	3.00	4.00	4.00	3.00	4.00	4.00	3.00	4.00	3.00	4.00	2.00	4.00	4.00	4.00	3.00	3.00	4.00	2.00	3.00	3.00	1.00	79.00
12	consultant 12	2.00	4.00	3.00	2.00	3.00	2.00	2.00	2.00	3.00	2.00	3.00	2.00	3.00	4.00	2.00	2.00	3.00	4.00	2.00	1.00	3.00	1.00	2.00	1.00	58.00
13	consultant 13	3.00	3.00	3.00	3.00	4.00	3.00	3.00	4.00	4.00	2.00	4.00	4.00	4.00	3.00	4.00	3.00	4.00	3.00	4.00	4.00	3.00	3.00	1.00	3.00	79.00
14	consultant 14	4.00	3.00	4.00	4.00	3.00	3.00	4.00	4.00	4.00	3.00	4.00	4.00	4.00	4.00	4.00	3.00	4.00	4.00	3.00	3.00	3.00	3.00	3.00	2.00	84.00
	14 item-level	0.68	0.46	0.59	0.69	0.55	0.53	0.53	0.71	0.58	0.64	0.40	0.59	0.80	0.64	1.02	0.99	0.57	0.42	0.69	1.30	0.53	0.53	0.62	1.14	16.20
		variance associated with the total score																								58.71
		Cronbach coefficient																								0.7555
		Pr=problem																								

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D. Cronbach's coefficient for clients

No.	RESPONDENT S	VALUES GIVEN FOR EACH INTEGRATION PROBLEMS																								Total
		Pr1	Pr2	Pr3	Pr4	Pr5	Pr6	Pr7	Pr8	Pr9	Pr10	Pr11	Pr12	Pr13	Pr14	Pr15	Pr16	Pr17	Pr18	Pr19	Pr20	Pr21	Pr22	Pr23	Pr24	
1	client 1	4.0	2.0	4.0	4.0	4.0	2.0	3.0	2.0	4.0	2.0	4.0	2.0	3.0	2.0	4.0	2.0	2.0	4.0	3.0	1.0	2.0	1.0	3.0	2.0	66.00
2	client 2	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	4.0	3.0	4.0	3.0	3.0	3.0	4.0	3.0	3.0	3.0	2.0	3.0	3.0	2.0	1.0	2.0	69.00
3	client 3	2.0	3.0	2.0	2.0	4.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	2.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	1.0	1.0	2.0	3.0	67.00
4	client 4	4.0	2.0	4.0	4.0	2.0	4.0	4.0	3.0	4.0	3.0	4.0	4.0	1.0	2.0	4.0	4.0	2.0	3.0	4.0	2.0	4.0	2.0	3.0	2.0	75.00
5	client 5	3.0	4.0	3.0	2.0	4.0	2.0	3.0	4.0	3.0	3.0	4.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	4.0	3.0	1.0	1.0	1.0	67.00
6	client 6	4.0	4.0	4.0	3.0	3.0	3.0	4.0	2.0	3.0	4.0	4.0	3.0	4.0	4.0	4.0	4.0	3.0	4.0	4.0	4.0	4.0	1.0	1.0	2.0	80.00
7	client 7	2.0	3.0	2.0	4.0	4.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0	1.0	1.0	2.0	56.00
8	client 8	4.0	4.0	4.0	2.0	2.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0	4.0	4.0	4.0	2.0	2.0	3.0	85.00
9	client 9	4.0	2.0	4.0	3.0	3.0	3.0	4.0	3.0	4.0	4.0	2.0	3.0	2.0	2.0	4.0	2.0	2.0	4.0	2.0	2.0	1.0	1.0	1.0	2.0	64.00
10	client 10	3.0	4.0	3.0	3.0	4.0	4.0	3.0	4.0	3.0	3.0	4.0	4.0	3.0	4.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0	3.0	1.0	3.0	78.00
11	client 11	4.0	4.0	4.0	4.0	4.0	2.0	4.0	2.0	4.0	4.0	4.0	2.0	2.0	4.0	2.0	3.0	2.0	4.0	4.0	1.0	3.0	1.0	2.0	1.0	71.00
12	client 12	4.0	4.0	4.0	3.0	4.0	3.0	3.0	4.0	3.0	3.0	4.0	4.0	3.0	4.0	3.0	2.0	4.0	2.0	4.0	4.0	3.0	3.0	1.0	2.0	78.00
13	client 13	4.0	2.0	4.0	3.0	3.0	3.0	4.0	3.0	3.0	4.0	3.0	4.0	3.0	2.0	3.0	3.0	3.0	3.0	4.0	3.0	4.0	1.0	3.0	3.0	75.00
	13 item-level variances	0.60	0.81	0.60	0.58	0.59	0.67	0.56	0.64	0.42	0.56	0.42	0.81	0.73	0.74	0.56	0.58	0.36	0.67	0.69	1.24	1.14	0.60	0.73	0.47	15.79
	variance associated with the total score																								61.42	
	Cronbach coefficient																								0.7751	

Pr=problem

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E. Cronbach's coefficient for overall respondents (contractors, consultants, clients and regulatory bodies)

No.	RESPONDENTS	VALUES GIVEN FOR EACH INTEGRATION PROBLEMS																								Total
		Pr1	Pr2	Pr3	Pr4	Pr5	Pr6	Pr7	Pr8	Pr9	Pr10	Pr11	Pr12	Pr13	Pr14	Pr15	Pr16	Pr17	Pr18	Pr19	Pr20	Pr21	Pr22	Pr23	Pr24	
1	contractor 1	3.0	2.0	3.0	3.0	4.0	2.0	4.0	3.0	4.0	4.0	3.0	2.0	3.0	4.0	3.0	3.0	2.0	2.0	4.0	2.0	2.0	2.0	3.0	3.0	70.0
2	contractor 2	4.0	3.0	4.0	3.0	3.0	4.0	3.0	2.0	3.0	3.0	4.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	3.0	2.0	4.0	2.0	1.0	4.0	73.0
3	contractor 3	4.0	4.0	2.0	2.0	3.0	3.0	2.0	3.0	2.0	4.0	4.0	4.0	4.0	3.0	4.0	2.0	2.0	4.0	3.0	2.0	2.0	1.0	1.0	4.0	69.0
4	contractor 4	3.0	2.0	4.0	2.0	2.0	3.0	3.0	3.0	3.0	4.0	2.0	2.0	3.0	3.0	3.0	4.0	3.0	3.0	4.0	2.0	3.0	2.0	1.0	2.0	66.0
5	contractor 5	4.0	3.0	4.0	4.0	4.0	4.0	2.0	4.0	3.0	3.0	4.0	2.0	4.0	2.0	3.0	2.0	4.0	3.0	4.0	2.0	4.0	2.0	1.0	3.0	75.0
6	contractor 6	2.0	2.0	2.0	2.0	2.0	4.0	3.0	3.0	4.0	4.0	3.0	3.0	3.0	3.0	4.0	4.0	3.0	3.0	2.0	2.0	1.0	3.0	1.0	4.0	67.0
7	contractor 7	3.0	2.0	4.0	2.0	3.0	3.0	4.0	3.0	4.0	3.0	3.0	3.0	4.0	4.0	3.0	3.0	4.0	2.0	3.0	2.0	4.0	2.0	1.0	3.0	72.0
8	contractor 8	3.0	3.0	3.0	3.0	3.0	4.0	3.0	3.0	2.0	3.0	3.0	4.0	3.0	3.0	4.0	3.0	3.0	3.0	4.0	2.0	3.0	2.0	1.0	4.0	72.0
9	contractor 9	3.0	3.0	4.0	3.0	3.0	3.0	4.0	2.0	3.0	4.0	4.0	4.0	2.0	2.0	3.0	4.0	2.0	3.0	4.0	3.0	3.0	2.0	1.0	2.0	71.0
10	contractor 10	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0	3.0	2.0	4.0	2.0	4.0	3.0	3.0	3.0	3.0	2.0	3.0	2.0	1.0	2.0	69.0
11	contractor 11	3.0	3.0	4.0	4.0	4.0	4.0	3.0	4.0	3.0	3.0	2.0	3.0	4.0	4.0	4.0	4.0	2.0	2.0	3.0	3.0	3.0	3.0	4.0	3.0	79.0
12	contractor 12	4.0	3.0	3.0	3.0	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	2.0	4.0	2.0	2.0	2.0	3.0	2.0	1.0	3.0	74.0
13	contractor 13	3.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0	3.0	2.0	4.0	2.0	3.0	3.0	4.0	4.0	4.0	2.0	4.0	4.0	3.0	3.0	82.0
14	contractor 14	4.0	2.0	2.0	2.0	3.0	4.0	4.0	3.0	4.0	3.0	4.0	4.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	1.0	3.0	67.0
15	contractor 15	3.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0	2.0	3.0	4.0	3.0	4.0	3.0	3.0	2.0	4.0	2.0	3.0	3.0	3.0	3.0	1.0	1.0	74.0
16	contractor 16	4.0	3.0	4.0	3.0	3.0	3.0	4.0	2.0	3.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	2.0	2.0	3.0	2.0	3.0	75.0
17	contractor 17	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	4.0	4.0	4.0	2.0	4.0	2.0	3.0	3.0	1.0	2.0	3.0	69.0
18	contractor 18	3.0	3.0	4.0	4.0	4.0	4.0	3.0	3.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	1.0	4.0	78.0
19	contractor 19	3.0	4.0	4.0	4.0	4.0	3.0	2.0	4.0	2.0	4.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0	2.0	3.0	3.0	84.0
20	contractor 20	4.0	3.0	4.0	4.0	4.0	4.0	3.0	4.0	3.0	3.0	2.0	3.0	2.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	1.0	3.0	74.0
21	contractor 21	4.0	3.0	3.0	3.0	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	1.0	3.0	86.0
22	contractor 22	3.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	3.0	2.0	3.0	3.0	4.0	3.0	3.0	2.0	2.0	2.0	4.0	2.0	2.0	3.0	1.0	2.0	59.0
23	contractor 23	3.0	3.0	4.0	2.0	3.0	3.0	3.0	4.0	4.0	2.0	4.0	3.0	3.0	3.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0	2.0	2.0	77.0
24	contractor 24	4.0	2.0	4.0	4.0	4.0	3.0	4.0	4.0	4.0	3.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0	2.0	3.0	3.0	3.0	2.0	1.0	3.0	79.0
25	contractor 25	2.0	4.0	2.0	2.0	2.0	4.0	3.0	4.0	3.0	4.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	4.0	3.0	2.0	2.0	3.0	1.0	3.0	68.0
26	contractor 26	4.0	4.0	4.0	3.0	3.0	4.0	4.0	3.0	4.0	2.0	4.0	4.0	4.0	2.0	2.0	4.0	4.0	4.0	4.0	3.0	1.0	3.0	2.0	3.0	78.0
27	contractor 27	4.0	4.0	4.0	4.0	4.0	3.0	4.0	4.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0	4.0	4.0	3.0	3.0	3.0	1.0	4.0	86.0
28	contractor 28	2.0	2.0	2.0	2.0	2.0	4.0	3.0	4.0	4.0	4.0	3.0	4.0	2.0	3.0	3.0	2.0	4.0	3.0	2.0	3.0	3.0	3.0	1.0	2.0	67.0
29	contractor 29	4.0	2.0	3.0	3.0	3.0	4.0	4.0	3.0	4.0	2.0	4.0	3.0	4.0	2.0	2.0	4.0	4.0	4.0	4.0	4.0	1.0	3.0	2.0	2.0	74.0
30	contractor 30	3.0	3.0	2.0	2.0	2.0	4.0	3.0	3.0	2.0	3.0	4.0	4.0	4.0	3.0	2.0	3.0	2.0	3.0	4.0	2.0	2.0	1.0	1.0	3.0	65.0
31	contractor 31	4.0	2.0	2.0	2.0	2.0	3.0	4.0	2.0	3.0	4.0	4.0	3.0	4.0	2.0	3.0	2.0	3.0	4.0	3.0	4.0	3.0	2.0	2.0	3.0	70.0
32	contractor 32	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	4.0	2.0	3.0	4.0	4.0	4.0	4.0	2.0	4.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	69.0
33	contractor 33	3.0	3.0	3.0	3.0	3.0	4.0	3.0	2.0	4.0	2.0	4.0	4.0	4.0	3.0	2.0	3.0	3.0	4.0	4.0	2.0	3.0	2.0	1.0	3.0	72.0
34	contractor 34	4.0	3.0	4.0	2.0	2.0	3.0	2.0	2.0	2.0	4.0	4.0	4.0	4.0	2.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	2.0	3.0	3.0	67.0
35	contractor 35	3.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0	2.0	3.0	2.0	4.0	2.0	2.0	4.0	3.0	3.0	2.0	2.0	2.0	3.0	3.0	72.0
36	contractor 36	4.0	4.0	2.0	2.0	2.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0	4.0	2.0	4.0	4.0	4.0	4.0	3.0	3.0	2.0	3.0	3.0	4.0	79.0

A Study on Problems Affecting the Integration of Major Construction Parties in Design-Bid-Build Project Delivery Method in the Addis Ababa 40-60 Housing Construction projects

No.	RESPONDENTS	VALUES GIVEN FOR EACH INTEGRATION PROBLEMS																								Total	
		Pr1	Pr2	Pr3	Pr4	Pr5	Pr6	Pr7	Pr8	Pr9	Pr10	Pr11	Pr12	Pr13	Pr14	Pr15	Pr16	Pr17	Pr18	Pr19	Pr20	Pr21	Pr22	Pr23	Pr24		
37	contractor 37	2.0	2.0	4.0	4.0	4.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	3.0	2.0	2.0	3.0	4.0	2.0	2.0	2.0	2.0	2.0	1.0	61.0	
38	contractor 38	3.0	4.0	4.0	3.0	3.0	3.0	3.0	2.0	4.0	3.0	3.0	4.0	4.0	3.0	4.0	3.0	4.0	3.0	3.0	4.0	4.0	3.0	1.0	3.0	78.0	
39	contractor 39	4.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0	3.0	87.0	
40	client 1	4.0	2.0	4.0	4.0	4.0	2.0	3.0	2.0	4.0	2.0	4.0	2.0	3.0	2.0	4.0	2.0	2.0	4.0	3.0	1.0	2.0	1.0	3.0	2.0	66.0	
41	client 2	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	4.0	3.0	4.0	3.0	3.0	3.0	4.0	3.0	3.0	3.0	2.0	3.0	3.0	2.0	1.0	2.0	69.0	
42	client 3	2.0	3.0	2.0	2.0	4.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	2.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	1.0	1.0	2.0	3.0	67.0	
43	client 4	4.0	2.0	4.0	4.0	2.0	4.0	4.0	3.0	4.0	3.0	4.0	4.0	1.0	2.0	4.0	4.0	2.0	3.0	4.0	2.0	4.0	2.0	3.0	2.0	75.0	
44	client 5	3.0	4.0	3.0	2.0	4.0	2.0	3.0	4.0	3.0	3.0	4.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	4.0	3.0	1.0	1.0	1.0	67.0	
45	client 6	4.0	4.0	4.0	3.0	3.0	3.0	4.0	2.0	3.0	4.0	4.0	3.0	4.0	4.0	4.0	4.0	3.0	4.0	4.0	4.0	4.0	1.0	1.0	2.0	80.0	
46	client 7	2.0	3.0	2.0	4.0	4.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0	1.0	1.0	2.0	56.0	
47	client 8	4.0	4.0	4.0	2.0	2.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0	4.0	4.0	4.0	2.0	2.0	3.0	85.0	
48	client 9	4.0	2.0	4.0	3.0	3.0	3.0	4.0	3.0	4.0	4.0	2.0	3.0	2.0	2.0	4.0	2.0	2.0	4.0	2.0	2.0	1.0	1.0	1.0	2.0	64.0	
49	client 10	3.0	4.0	3.0	3.0	4.0	4.0	3.0	4.0	3.0	3.0	4.0	4.0	3.0	4.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0	3.0	1.0	3.0	78.0	
50	client 11	4.0	4.0	4.0	4.0	4.0	2.0	4.0	2.0	4.0	4.0	4.0	2.0	2.0	4.0	2.0	3.0	2.0	4.0	4.0	1.0	3.0	1.0	2.0	1.0	71.0	
51	client 12	4.0	4.0	4.0	3.0	4.0	3.0	3.0	4.0	3.0	3.0	4.0	4.0	3.0	4.0	3.0	2.0	4.0	2.0	4.0	4.0	3.0	3.0	1.0	2.0	78.0	
52	client 13	4.0	2.0	4.0	3.0	3.0	3.0	4.0	3.0	3.0	4.0	3.0	4.0	3.0	2.0	3.0	3.0	3.0	3.0	4.0	3.0	4.0	1.0	3.0	3.0	75.0	
53	consultant 1	4.0	2.0	4.0	4.0	4.0	3.0	3.0	4.0	4.0	3.0	4.0	1.0	4.0	2.0	3.0	4.0	4.0	4.0	4.0	4.0	2.0	2.0	2.0	4.0	79.0	
54	consultant 2	3.0	4.0	3.0	3.0	3.0	3.0	2.0	3.0	4.0	2.0	4.0	3.0	3.0	3.0	3.0	3.0	2.0	4.0	4.0	3.0	3.0	2.0	1.0	2.0	70.0	
55	consultant 3	2.0	3.0	2.0	3.0	4.0	4.0	3.0	4.0	4.0	4.0	3.0	3.0	2.0	3.0	3.0	2.0	4.0	4.0	2.0	3.0	3.0	3.0	3.0	4.0	75.0	
56	consultant 4	4.0	3.0	3.0	4.0	4.0	4.0	4.0	3.0	4.0	2.0	4.0	3.0	4.0	2.0	2.0	4.0	4.0	4.0	3.0	1.0	4.0	2.0	2.0	3.0	77.0	
57	consultant 5	3.0	2.0	4.0	2.0	4.0	4.0	3.0	4.0	2.0	3.0	4.0	2.0	3.0	3.0	2.0	3.0	3.0	3.0	4.0	2.0	3.0	1.0	1.0	1.0	66.0	
58	consultant 6	4.0	3.0	3.0	2.0	3.0	3.0	4.0	2.0	3.0	4.0	4.0	3.0	4.0	2.0	1.0	1.0	3.0	4.0	3.0	4.0	4.0	2.0	2.0	1.0	69.0	
59	consultant 7	2.0	3.0	2.0	4.0	2.0	2.0	2.0	3.0	4.0	2.0	3.0	3.0	2.0	3.0	1.0	2.0	4.0	3.0	2.0	3.0	2.0	2.0	2.0	2.0	60.0	
60	consultant 8	4.0	4.0	4.0	2.0	2.0	4.0	3.0	2.0	4.0	2.0	4.0	3.0	4.0	2.0	2.0	3.0	3.0	4.0	4.0	1.0	4.0	2.0	1.0	3.0	71.0	
61	consultant 9	4.0	2.0	4.0	4.0	3.0	3.0	2.0	4.0	2.0	4.0	4.0	3.0	2.0	2.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	1.0	3.0	2.0	65.0	
62	consultant 10	3.0	3.0	2.0	3.0	4.0	4.0	3.0	4.0	3.0	3.0	2.0	3.0	2.0	4.0	3.0	1.0	4.0	4.0	3.0	3.0	3.0	2.0	2.0	3.0	71.0	
63	consultant 11	4.0	3.0	3.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	3.0	4.0	2.0	4.0	4.0	4.0	3.0	3.0	4.0	2.0	3.0	3.0	1.0	79.0	
64	consultant 12	2.0	4.0	3.0	2.0	3.0	2.0	2.0	2.0	3.0	2.0	3.0	2.0	3.0	4.0	2.0	2.0	3.0	4.0	2.0	1.0	3.0	1.0	2.0	1.0	58.0	
65	consultant 13	3.0	3.0	3.0	3.0	4.0	3.0	3.0	4.0	4.0	2.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	4.0	3.0	3.0	1.0	3.0	79.0	
66	consultant 14	4.0	3.0	4.0	4.0	3.0	3.0	4.0	4.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	2.0	84.0	
67	Regulatory body 1	4.0	3.0	3.0	4.0	4.0	4.0	3.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0	3.0	3.0	3.0	1.0	2.0	2.0	76.0	
68	Regulatory body 2	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	4.0	4.0	3.0	4.0	3.0	3.0	4.0	2.0	2.0	3.0	86.0
69	Regulatory body 3	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0	3.0	3.0	4.0	4.0	1.0	2.0	3.0	85.0	
	variances	0.50	0.57	0.63	0.63	0.56	0.52	0.46	0.61	0.51	0.57	0.43	0.62	0.67	0.60	0.66	0.64	0.61	0.60	0.56	0.91	0.73	0.60	0.79	0.71	14.69	
	variance associated with the total score																								51.94		
	Cronbach coefficient																								0.7484		
	Pr=problem																										

A Study on Problems Affecting the Integration of Major Construction Parties in Design-Bid-Build Project Delivery Method in the Addis Ababa 40-60 Housing Construction projects

Appendix D- Analysis of Correlation coefficient between different respondent parties

A. Analysis of Correlation coefficient between Contractor and consultant

No.	Major problem/s which affect the integration of major construction parties in city governance of Addis Ababa 40-60 saving houses of construction projects	probability of problems based on Scale of important problems for consultants							probability of problems based on Scale of important problems for contractors							Rank difference= Rank (client)-Rank (contractor)=d	d2	
		1(Not at all)	2(minor)	3(moderate)	4(serious)	total	RII (consultants)	Rank (consultants)	1(Not at all)	2(minor)	3(moderate)	4(serious)	total	RII (contractor)	Rank (contractor)			
1	Lack of knowledge by the client about project processes and integration issues, and inadequate technical skill by the client	-	3.00	4.00	7.00	14.00	0.8214	6	-	4.00	18.00	17.00	39.00	0.8333	5	1	1	
2	Unwilling and unenthusiastic participation of contracting parties	-	3.00	8.00	3.00	14.00	0.7500	10	-	11.00	18.00	10.00	39.00	0.7436	16	-6	36	
3	Inadequate preparation and planning before commencement of a project	-	3.00	6.00	5.00	14.00	0.7857	8	-	9.00	10.00	20.00	39.00	0.8205	7	1	1	
4	Lack of integrated planning and scheduling for different contracting parties	-	4.00	5.00	5.00	14.00	0.7679	9	-	13.00	15.00	11.00	39.00	0.7372	17	-8	64	
5	Lack of personnel, financial and physical resources by owners, contractors and consultants for construction project relative to requirements	-	2.00	5.00	7.00	14.00	0.8393	5	-	9.00	18.00	12.00	39.00	0.7692	14	-9	81	
6	Lack of commitment by involved parties	-	2.00	6.00	6.00	14.00	0.8214	6	-	4.00	14.00	21.00	39.00	0.8590	3	3	9	
7	Technical incompetence and limited personal experience of consultant	-	4.00	7.00	3.00	14.00	0.7321	11	-	5.00	23.00	11.00	39.00	0.7885	12	-1	1	
8	Technical incompetence and limited personal experience of contractor	-	3.00	3.00	8.00	14.00	0.8393	5	-	9.00	16.00	14.00	39.00	0.7821	13	-8	64	
9	Poor communication between relevant construction parties	-	2.00	3.00	9.00	14.00	0.8750	3	-	6.00	15.00	18.00	39.00	0.8269	6	-3	9	
10	Insufficient design communication between consultant and owner	-	6.00	5.00	3.00	14.00	0.6964	13	-	8.00	16.00	15.00	39.00	0.7949	11	2	4	
11	Self-serving objectives; lack of co-ordination; Lack of trust and reliability among contracting parties; and disregarding contextual issues	-	1.00	3.00	10.00	14.00	0.9107	1	-	4.00	13.00	22.00	39.00	0.8654	2	-1	1	
12	Lack of creating integrated single project team with all members located together in a project	1.00	2.00	9.00	2.00	14.00	0.7143	12	-	6.00	13.00	20.00	39.00	0.8397	4	8	64	
13	Lack of clearly defined responsibility of each contracting party in the contract for the project	-	4.00	3.00	7.00	14.00	0.8036	7	-	5.00	10.00	24.00	39.00	0.8718	1	6	36	
14	Inadequate design information in the contract	-	6.00	5.00	3.00	14.00	0.6964	13	-	10.00	18.00	11.00	39.00	0.7564	15	-2	4	
15	Inadequate contract and specification	2.00	4.00	5.00	3.00	14.00	0.6607	15	-	6.00	18.00	15.00	39.00	0.8077	9	6	36	
16	Lack of modern contracting system among construction parties (such as partnering)	2.00	3.00	6.00	3.00	14.00	0.6786	14	-	12.00	17.00	10.00	39.00	0.7372	17	-3	9	
17	Bureaucratic client organization and greater process and administrative rules and regulations	-	2.00	4.00	8.00	14.00	0.8571	4	-	9.00	11.00	19.00	39.00	0.8141	8	-4	16	
18	Lack of integration management among the contracting parties by the clients	-	1.00	4.00	9.00	14.00	0.8929	2	-	10.00	16.00	13.00	39.00	0.7692	14	-12	144	
19	Lack of involvement of contractor in design development phase	-	4.00	5.00	5.00	14.00	0.7679	9	-	7.00	17.00	15.00	39.00	0.8013	10	-1	1	
20	Interpersonal and organizational culture difference	3.00	2.00	5.00	4.00	14.00	0.6786	14	2.00	22.00	9.00	6.00	39.00	0.6218	19	-5	25	
21	lack of strong, professionally experienced and responsible client	-	4.00	7.00	3.00	14.00	0.7321	11	2.00	10.00	18.00	9.00	39.00	0.7179	18	-7	49	
22	Geological conditions	3.00	7.00	4.00	-	14.00	0.5179	17	2.00	22.00	13.00	2.00	39.00	0.5962	20	-3	9	
23	weather conditions on site	4.00	6.00	4.00	-	14.00	0.5000	18	23.00	6.00	8.00	2.00	39.00	0.4295	21	-3	9	
24	Absence of any risk reward plans for different parties	4.00	4.00	4.00	2.00	14.00	0.5714	16	2.00	7.00	24.00	6.00	39.00	0.7179	18	-2	4	
															Total sum of d ² =	677		
															Spearman's rank correlati	$\rho = 1 - \frac{6 \sum d_i^2}{n(n^2-1)}$	=	0.7057

A Study on Problems Affecting the Integration of Major Construction Parties in Design-Bid-Build Project Delivery Method in the Addis Ababa 40-60 Housing Construction projects

B. Analysis of Correlation coefficient between client and consultant

No.	Major problem/s which affect the integration of major construction parties in city governance of Addis Ababa saving houses construction projects (40/60 housing program)	probability of problems based on Scale of important problems for clients							probability of problems based on Scale of important problems for consultants							Rank difference= Rank (client)-Rank (contractor)=d	d ²
		1(Not at all)	2(minor)	3(moderate)	4(serious)	total	RII (client)	Rank (client)	1(Not at all)	2(minor)	3(moderate)	4(serious)	total	RII (consultants)	Rank (consultants)		
1	Lack of knowledge by the client about project processes and integration issues, and inadequate technical skill by the client	-	2.00	3.00	8.00	13.00	0.8654	2	-	3.00	4.00	7.00	14.00	0.8214	6	-4	16
2	Unwilling and unenthusiastic participation of contracting parties	-	4.00	3.00	6.00	13.00	0.7885	6	-	3.00	8.00	3.00	14.00	0.7500	10	-4	16
3	Inadequate preparation and planning before commencement of a project	-	2.00	3.00	8.00	13.00	0.8654	2	-	3.00	6.00	5.00	14.00	0.7857	8	-6	36
4	Lack of integrated planning and scheduling for different contracting parties	-	3.00	6.00	4.00	13.00	0.7692	7	-	4.00	5.00	5.00	14.00	0.7679	9	-2	4
5	Lack of personnel, financial and physical resources by owners, contractors and consultants for construction project relative to requirements	-	2.00	4.00	7.00	13.00	0.8462	3	-	2.00	5.00	7.00	14.00	0.8393	5	-2	4
6	Lack of commitment by involved parties	-	4.00	5.00	4.00	13.00	0.7500	8	-	2.00	6.00	6.00	14.00	0.8214	6	2	4
7	Technical incompetence and limited personal experience of consultant	-	2.00	5.00	6.00	13.00	0.8269	4	-	4.00	7.00	3.00	14.00	0.7321	11	-7	49
8	Technical incompetence and limited personal experience of contractor	-	3.00	5.00	5.00	13.00	0.7885	6	-	3.00	3.00	8.00	14.00	0.8393	5	1	1
9	Poor communication between relevant construction parties	-	1.00	6.00	6.00	13.00	0.8462	3	-	2.00	3.00	9.00	14.00	0.8750	3	0	0
10	Insufficient design communication between consultant and owner	-	2.00	5.00	6.00	13.00	0.8269	4	-	6.00	5.00	3.00	14.00	0.6964	13	-9	81
11	Self-serving objectives; lack of co-ordination; Lack of trust and reliability among contracting parties; and disregarding contextual issues	-	1.00	3.00	9.00	13.00	0.9038	1	-	1.00	3.00	10.00	14.00	0.9107	1	0	0
12	Lack of creating integrated single project team with all members located together in a project	-	4.00	3.00	6.00	13.00	0.7885	6	1.00	2.00	9.00	2.00	14.00	0.7143	12	-6	36
13	Lack of clearly defined responsibility of each contracting party in the contract for the project	1.00	4.00	6.00	2.00	13.00	0.6731	12	-	4.00	3.00	7.00	14.00	0.8036	7	5	25
14	Inadequate design information in the contract	-	4.00	4.00	5.00	13.00	0.7692	7	-	6.00	5.00	3.00	14.00	0.6964	13	-6	36
15	Inadequate contract and specification	-	2.00	5.00	6.00	13.00	0.8269	4	2.00	4.00	5.00	3.00	14.00	0.6607	15	-11	121
16	Lack of modern contracting system among construction parties (such as partnering)	-	4.00	6.00	3.00	13.00	0.7308	9	2.00	3.00	6.00	3.00	14.00	0.6786	14	-5	25
17	Bureaucratic client organization and greater process and administrative rules and regulations	-	4.00	8.00	1.00	13.00	0.6923	11	-	2.00	4.00	8.00	14.00	0.8571	4	7	49
18	Lack of integration management among the contracting parties by the clients	-	4.00	5.00	4.00	13.00	0.7500	8	-	1.00	4.00	9.00	14.00	0.8929	2	6	36
19	Lack of involvement of contractor in design development phase	-	3.00	4.00	6.00	13.00	0.8077	5	-	4.00	5.00	5.00	14.00	0.7679	9	-4	16
20	Interpersonal and organizational culture difference	2.00	2.00	4.00	5.00	13.00	0.7308	9	3.00	2.00	5.00	4.00	14.00	0.6786	14	-5	25
21	lack of strong, professionally experienced and responsible client	2.00	2.00	5.00	4.00	13.00	0.7115	10	-	4.00	7.00	3.00	14.00	0.7321	11	-1	1
22	Geological conditions	8.00	3.00	2.00	-	13.00	0.3846	15	3.00	7.00	4.00	-	14.00	0.5179	17	-2	4
23	weather conditions on site	7.00	3.00	3.00	-	13.00	0.4231	14	4.00	6.00	4.00	-	14.00	0.5000	18	-4	16
24	Absence of any risk reward plans for different parties	2.00	7.00	4.00	-	13.00	0.5385	13	4.00	4.00	4.00	2.00	14.00	0.5714	16	-3	9
Total sum of d²=																610	
Spearman's rank correlation $\rho = 1 - \frac{6 \sum d_i^2}{n(n^2 - 1)}$																= 0.7348	

A Study on Problems Affecting the Integration of Major Construction Parties in Design-Bid-Build Project Delivery Method in the Addis Ababa 40-60 Housing Construction projects

C. Analysis of Correlation coefficient between client and contractors

No.	Major problem/s which affect the integration of major construction parties in city governance of Addis Ababa 40-60 saving houses construction projects	probability of problems based on Scale of important problems for							probability of problems based on Scale of important problems for							Rank difference= Rank (client)- Rank	d2
		1(Not at all)	2(minor)	3(moderate)	4(serious)	total	RII (client)	Rank (client)	1(Not at all)	2(minor)	3(moderate)	4(serious)	total	RII (contractor)	Rank (contractor)		
1	Lack of knowledge by the client about project processes and integration issues, and inadequate technical skill by the client	-	2.00	3.00	8.00	13.00	0.8654	2	-	4.00	18.00	17.00	39.00	0.8333	5	-3	9
2	Unwilling and unenthusiastic participation of contracting parties	-	4.00	3.00	6.00	13.00	0.7885	6	-	11.00	18.00	10.00	39.00	0.7436	16	-10	100
3	Inadequate preparation and planning before commencement of a project	-	2.00	3.00	8.00	13.00	0.8654	2	-	9.00	10.00	20.00	39.00	0.8205	7	-5	25
4	Lack of integrated planning and scheduling for different contracting parties	-	3.00	6.00	4.00	13.00	0.7692	7	-	13.00	15.00	11.00	39.00	0.7372	17	-10	100
5	Lack of personnel, financial and physical resources by owners, contractors and consultants for construction project relative to requirements	-	2.00	4.00	7.00	13.00	0.8462	3	-	9.00	18.00	12.00	39.00	0.7692	14	-11	121
6	Lack of commitment by involved parties	-	4.00	5.00	4.00	13.00	0.7500	8	-	4.00	14.00	21.00	39.00	0.8590	3	5	25
7	Technical incompetence and limited personal experience of consultant	-	2.00	5.00	6.00	13.00	0.8269	4	-	5.00	23.00	11.00	39.00	0.7885	12	-8	64
8	Technical incompetence and limited personal experience of contractor	-	3.00	5.00	5.00	13.00	0.7885	6	-	9.00	16.00	14.00	39.00	0.7821	13	-7	49
9	Poor communication between relevant construction parties	-	1.00	6.00	6.00	13.00	0.8462	3	-	6.00	15.00	18.00	39.00	0.8269	6	-3	9
10	Insufficient design communication between consultant and owner	-	2.00	5.00	6.00	13.00	0.8269	4	-	8.00	16.00	15.00	39.00	0.7949	11	-7	49
11	Self-serving objectives; lack of co-ordination; Lack of trust and reliability among contracting parties; and disregarding contextual issues	-	1.00	3.00	9.00	13.00	0.9038	1	-	4.00	13.00	22.00	39.00	0.8654	2	-1	1
12	Lack of creating integrated single project team with all members located together in a project	-	4.00	3.00	6.00	13.00	0.7885	6	-	6.00	13.00	20.00	39.00	0.8397	4	2	4
13	Lack of clearly defined responsibility of each contracting party in the contract for the project	1.00	4.00	6.00	2.00	13.00	0.6731	12	-	5.00	10.00	24.00	39.00	0.8718	1	11	121
14	Inadequate design information in the contract	-	4.00	4.00	5.00	13.00	0.7692	7	-	10.00	18.00	11.00	39.00	0.7564	15	-8	64
15	Inadequate contract and specification	-	2.00	5.00	6.00	13.00	0.8269	4	-	6.00	18.00	15.00	39.00	0.8077	9	-5	25
16	Lack of modern contracting system among construction parties (such as partnering)	-	4.00	6.00	3.00	13.00	0.7308	9	-	12.00	17.00	10.00	39.00	0.7372	17	-8	64
17	Bureaucratic client organization and greater process and administrative rules and regulations	-	4.00	8.00	1.00	13.00	0.6923	11	-	9.00	11.00	19.00	39.00	0.8141	8	3	9
18	Lack of integration management among the contracting parties by the clients	-	4.00	5.00	4.00	13.00	0.7500	8	-	10.00	16.00	13.00	39.00	0.7692	14	-6	36
19	Lack of involvement of contractor in design development phase	-	3.00	4.00	6.00	13.00	0.8077	5	-	7.00	17.00	15.00	39.00	0.8013	10	-5	25
20	Interpersonal and organizational culture difference	2.00	2.00	4.00	5.00	13.00	0.7308	9	2.00	22.00	9.00	6.00	39.00	0.6218	19	-10	100
21	lack of strong, professionally experienced and responsible client	2.00	2.00	5.00	4.00	13.00	0.7115	10	2.00	10.00	18.00	9.00	39.00	0.7179	18	-8	64
22	Geological conditions	8.00	3.00	2.00	-	13.00	0.3846	15	2.00	22.00	13.00	2.00	39.00	0.5962	20	-5	25
23	weather conditions on site	7.00	3.00	3.00	-	13.00	0.4231	14	23.00	6.00	8.00	2.00	39.00	0.4295	21	-7	49
24	Absence of any risk reward plans for different parties	2.00	7.00	4.00	-	13.00	0.5385	13	2.00	7.00	24.00	6.00	39.00	0.7179	18	-5	25
Total sum of d ² =																	1163
Spearman's rank correlation coefficient= $\rho = 1 - \frac{6 \sum d_i^2}{n(n^2 - 1)}$																	= 0.4943

A Study on Problems Affecting the Integration of Major Construction Parties in Design-Bid-Build Project Delivery Method in the Addis Ababa 40-60 Housing Construction projects

D. Analysis of Correlation coefficient between regulatory body and contractor

No.	Major problem/s which affect the integration of major construction parties in city governance of Addis Ababa 40-60 saving houses construction projects	probability of problems based on Scale of important problems for regulatory body							probability of problems based on Scale of important problems for contractors							Rank difference= Rank (client)- Rank (contractor)=d	d ²
		1(Not at all)	2(minor)	3(moderate)	4(serious)	total	RII (client)	Rank (regulatory)	1(Not at all)	2(minor)	3(moderate)	4(serious)	total	RII (contractor)	Rank (contractor)		
1	Lack of knowledge by the client about project processes and integration issues, and inadequate technical skill by the client	-	-	-	3.00	3.00	1.0000	1	-	4.00	18.00	17.00	39.00	0.8333	5	-4	16
2	Unwilling and unenthusiastic participation of contracting parties	-	-	1.00	2.00	3.00	0.9167	2	-	11.00	18.00	10.00	39.00	0.7436	16	-14	196
3	Inadequate preparation and planning before commencement of a project	-	-	1.00	2.00	3.00	0.9167	2	-	9.00	10.00	20.00	39.00	0.8205	7	-5	25
4	Lack of integrated planning and scheduling for different contracting parties	-	-	-	3.00	3.00	1.0000	1	-	13.00	15.00	11.00	39.00	0.7372	17	-16	256
5	Lack of personnel, financial and physical resources by owners, contractors and consultants for construction project relative to requirements	-	-	-	3.00	3.00	1.0000	1	-	9.00	18.00	12.00	39.00	0.7692	14	-13	169
6	Lack of commitment by involved parties	-	-	-	3.00	3.00	1.0000	1	-	4.00	14.00	21.00	39.00	0.8590	3	-2	4
7	Technical incompetence and limited personal experience of consultant	-	-	1.00	2.00	3.00	0.9167	2	-	5.00	23.00	11.00	39.00	0.7885	12	-10	100
8	Technical incompetence and limited personal experience of contractor	-	-	1.00	2.00	3.00	0.9167	2	-	9.00	16.00	14.00	39.00	0.7821	13	-11	121
9	Poor communication between relevant construction parties	-	-	-	3.00	3.00	1.0000	1	-	6.00	15.00	18.00	39.00	0.8269	6	-5	25
10	Insufficient design communication between consultant and owner	-	-	3.00	-	3.00	0.7500	4	-	8.00	16.00	15.00	39.00	0.7949	11	-7	49
11	Self-serving objectives; lack of co-ordination; Lack of trust and reliability among contracting parties; and disregarding contextual issues	-	-	1.00	2.00	3.00	0.9167	2	-	4.00	13.00	22.00	39.00	0.8654	2	0	0
12	Lack of creating integrated single project team with all members located together in a project	-	-	1.00	2.00	3.00	0.9167	2	-	6.00	13.00	20.00	39.00	0.8397	4	-2	4
13	Lack of clearly defined responsibility of each contracting party in the contract for the project	-	-	2.00	1.00	3.00	0.8333	3	-	5.00	10.00	24.00	39.00	0.8718	1	2	4
14	Inadequate design information in the contract	-	-	1.00	2.00	3.00	0.9167	2	-	10.00	18.00	11.00	39.00	0.7564	15	-13	169
15	Inadequate contract and specification	-	-	1.00	2.00	3.00	0.9167	2	-	6.00	18.00	15.00	39.00	0.8077	9	-7	49
16	Lack of modern contracting system among construction parties (such as partnering)	-	-	2.00	1.00	3.00	0.8333	3	-	12.00	17.00	10.00	39.00	0.7372	17	-14	196
17	Bureaucratic client organization and greater process and administrative rules and regulations	-	-	1.00	2.00	3.00	0.9167	2	-	9.00	11.00	19.00	39.00	0.8141	8	-6	36
18	Lack of integration management among the contracting parties by the clients	-	-	1.00	2.00	3.00	0.9167	2	-	10.00	16.00	13.00	39.00	0.7692	14	-12	144
19	Lack of involvement of contractor in design development phase	-	-	3.00	-	3.00	0.7500	4	-	7.00	17.00	15.00	39.00	0.8013	10	-6	36
20	Interpersonal and organizational culture difference	-	-	2.00	1.00	3.00	0.8333	3	2.00	22.00	9.00	6.00	39.00	0.6218	19	-16	256
21	lack of strong, professionally experienced and responsible client	-	-	1.00	2.00	3.00	0.9167	2	2.00	10.00	18.00	9.00	39.00	0.7179	18	-16	256
22	Geological conditions	2.00	1.00	-	-	3.00	0.3333	7	2.00	22.00	13.00	2.00	39.00	0.5962	20	-13	169
23	weather conditions on site	-	3.00	-	-	3.00	0.5000	6	23.00	6.00	8.00	2.00	39.00	0.4295	21	-15	225
24	Absence of any risk reward plans for different parties	-	1.00	2.00	-	3.00	0.6667	5	2.00	7.00	24.00	6.00	39.00	0.7179	18	-13	169
Total sum of d ² =																2674	
Spearman's rank correlation coefficient $\rho = 1 - \frac{6 \sum d_i^2}{n(n^2 - 1)}$																= -0.1626	

A Study on Problems Affecting the Integration of Major Construction Parties in Design-Bid-Build Project Delivery Method in the Addis Ababa 40-60 Housing Construction projects

E. Analysis of Correlation coefficient between regulatory body and client

No.	Major problem/s which affect the integration of major construction parties in city governance of Addis Ababa 40-60 saving houses construction projects	probability of problems based on Scale of important problems for regulatory body							probability of problems based on Scale of important problems for clients							Rank difference= Rank (client)- Rank (contractor)=d	d ²
		1(Not at all)	2(minor)	3(moderate)	4(serious)	total	RII (client)	Rank (regulatory)	1(Not at all)	2(minor)	3(moderate)	4(serious)	total	RII (contractor)	Rank (contractor)		
1	Lack of knowledge by the client about project processes and integration issues, and inadequate technical skill by the client	-	-	-	3.00	3.00	1.0000	1	-	2.00	3.00	8.00	13.00	0.8654	2	-1	1
2	Unwilling and unenthusiastic participation of contracting parties	-	-	1.00	2.00	3.00	0.9167	2	-	4.00	3.00	6.00	13.00	0.7885	6	-4	16
3	Inadequate preparation and planning before commencement of a project	-	-	1.00	2.00	3.00	0.9167	2	-	2.00	3.00	8.00	13.00	0.8654	2	0	0
4	Lack of integrated planning and scheduling for different contracting parties	-	-	-	3.00	3.00	1.0000	1	-	3.00	6.00	4.00	13.00	0.7692	7	-6	36
5	Lack of personnel, financial and physical resources by owners, contractors and consultants for construction project relative to requirements	-	-	-	3.00	3.00	1.0000	1	-	2.00	4.00	7.00	13.00	0.8462	3	-2	4
6	Lack of commitment by involved parties	-	-	-	3.00	3.00	1.0000	1	-	4.00	5.00	4.00	13.00	0.7500	8	-7	49
7	Technical incompetence and limited personal experience of consultant	-	-	1.00	2.00	3.00	0.9167	2	-	2.00	5.00	6.00	13.00	0.8269	4	-2	4
8	Technical incompetence and limited personal experience of contractor	-	-	1.00	2.00	3.00	0.9167	2	-	3.00	5.00	5.00	13.00	0.7885	6	-4	16
9	Poor communication between relevant construction parties	-	-	-	3.00	3.00	1.0000	1	-	1.00	6.00	6.00	13.00	0.8462	3	-2	4
10	Insufficient design communication between consultant and owner	-	-	3.00	-	3.00	0.7500	4	-	2.00	5.00	6.00	13.00	0.8269	4	0	0
11	Self-serving objectives; lack of co-ordination; Lack of trust and reliability among contracting parties; and disregarding contextual issues	-	-	1.00	2.00	3.00	0.9167	2	-	1.00	3.00	9.00	13.00	0.9038	1	1	1
12	Lack of creating integrated single project team with all members located together in a project	-	-	1.00	2.00	3.00	0.9167	2	-	4.00	3.00	6.00	13.00	0.7885	6	-4	16
13	Lack of clearly defined responsibility of each contracting party in the contract for the project	-	-	2.00	1.00	3.00	0.8333	3	1.00	4.00	6.00	2.00	13.00	0.6731	12	-9	81
14	Inadequate design information in the contract	-	-	1.00	2.00	3.00	0.9167	2	-	4.00	4.00	5.00	13.00	0.7692	7	-5	25
15	Inadequate contract and specification	-	-	1.00	2.00	3.00	0.9167	2	-	2.00	5.00	6.00	13.00	0.8269	4	-2	4
16	Lack of modern contracting system among construction parties (such as partnering)	-	-	2.00	1.00	3.00	0.8333	3	-	4.00	6.00	3.00	13.00	0.7308	9	-6	36
17	Bureaucratic client organization and greater process and administrative rules and regulations	-	-	1.00	2.00	3.00	0.9167	2	-	4.00	8.00	1.00	13.00	0.6923	11	-9	81
18	Lack of integration management among the contracting parties by the clients	-	-	1.00	2.00	3.00	0.9167	2	-	4.00	5.00	4.00	13.00	0.7500	8	-6	36
19	Lack of involvement of contractor in design development phase	-	-	3.00	-	3.00	0.7500	4	-	3.00	4.00	6.00	13.00	0.8077	5	-1	1
20	Interpersonal and organizational culture difference	-	-	2.00	1.00	3.00	0.8333	3	2.00	2.00	4.00	5.00	13.00	0.7308	9	-6	36
21	lack of strong, professionally experienced and responsible client	-	-	1.00	2.00	3.00	0.9167	2	2.00	2.00	5.00	4.00	13.00	0.7115	10	-8	64
22	Geological conditions	2.00	1.00	-	-	3.00	0.3333	7	8.00	3.00	2.00	-	13.00	0.3846	15	-8	64
23	weather conditions on site	-	3.00	-	-	3.00	0.5000	6	7.00	3.00	3.00	-	13.00	0.4231	14	-8	64
24	Absence of any risk reward plans for different parties	-	1.00	2.00	-	3.00	0.6667	5	2.00	7.00	4.00	-	13.00	0.5385	13	-8	64
Total sum of d ² =																703	
Spearman's rank correlation coefficient $\rho = 1 - \frac{6 \sum d_i^2}{n(n^2 - 1)}$																=	0.6943

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F. Analysis of Correlation coefficient between regulatory body and consultant

No.	Major problem/s which affect the integration of major construction parties in city governance of Addis Ababa 40-60 saving houses construction projects	probability of problems based on Scale of important problems for regulatory body							probability of problems based on Scale of important problems for consultants							Rank difference= Rank (client)- Rank (contractor)=d	d ²	
		1(Not at all)	2(minor)	3(moderate)	4(serious)	total	RII (client)	Rank (regulatory)	1(Not at all)	2(minor)	3(moderate)	4(serious)	total	RII (consultants)	Rank (consultants)			
1	Lack of knowledge by the client about project processes and integration issues, and inadequate technical skill by the client	-	-	-	3.00	3.00	1.0000	1	-	3.00	4.00	7.00	14.00	0.8214	6	-5	25	
2	Unwilling and unenthusiastic participation of contracting parties	-	-	1.00	2.00	3.00	0.9167	2	-	3.00	8.00	3.00	14.00	0.7500	10	-8	64	
3	Inadequate preparation and planning before commencement of a project	-	-	1.00	2.00	3.00	0.9167	2	-	3.00	6.00	5.00	14.00	0.7857	8	-6	36	
4	Lack of integrated planning and scheduling for different contracting parties	-	-	-	3.00	3.00	1.0000	1	-	4.00	5.00	5.00	14.00	0.7679	9	-8	64	
5	Lack of personnel, financial and physical resources by owners, contractors and consultants for construction project relative to requirements	-	-	-	3.00	3.00	1.0000	1	-	2.00	5.00	7.00	14.00	0.8393	5	-4	16	
6	Lack of commitment by involved parties	-	-	-	3.00	3.00	1.0000	1	-	2.00	6.00	6.00	14.00	0.8214	6	-5	25	
7	Technical incompetence and limited personal experience of consultant	-	-	1.00	2.00	3.00	0.9167	2	-	4.00	7.00	3.00	14.00	0.7321	11	-9	81	
8	Technical incompetence and limited personal experience of contractor	-	-	1.00	2.00	3.00	0.9167	2	-	3.00	3.00	8.00	14.00	0.8393	5	-3	9	
9	Poor communication between relevant construction parties	-	-	-	3.00	3.00	1.0000	1	-	2.00	3.00	9.00	14.00	0.8750	3	-2	4	
10	Insufficient design communication between consultant and owner	-	-	3.00	-	3.00	0.7500	4	-	6.00	5.00	3.00	14.00	0.6964	13	-9	81	
11	Self-serving objectives; lack of co-ordination; Lack of trust and reliability among contracting parties; and disregarding contextual issues	-	-	1.00	2.00	3.00	0.9167	2	-	1.00	3.00	10.00	14.00	0.9107	1	1	1	
12	Lack of creating integrated single project team with all members located together in a project	-	-	1.00	2.00	3.00	0.9167	2	1.00	2.00	9.00	2.00	14.00	0.7143	12	-10	100	
13	Lack of clearly defined responsibility of each contracting party in the contract for the project	-	-	2.00	1.00	3.00	0.8333	3	-	4.00	3.00	7.00	14.00	0.8036	7	-4	16	
14	Inadequate design information in the contract	-	-	1.00	2.00	3.00	0.9167	2	-	6.00	5.00	3.00	14.00	0.6964	13	-11	121	
15	Inadequate contract and specification	-	-	1.00	2.00	3.00	0.9167	2	2.00	4.00	5.00	3.00	14.00	0.6607	15	-13	169	
16	Lack of modern contracting system among construction parties (such as partnering)	-	-	2.00	1.00	3.00	0.8333	3	2.00	3.00	6.00	3.00	14.00	0.6786	14	-11	121	
17	Bureaucratic client organization and greater process and administrative rules and regulations	-	-	1.00	2.00	3.00	0.9167	2	-	2.00	4.00	8.00	14.00	0.8571	4	-2	4	
18	Lack of integration management among the contracting parties by the clients	-	-	1.00	2.00	3.00	0.9167	2	-	1.00	4.00	9.00	14.00	0.8929	2	0	0	
19	Lack of involvement of contractor in design development phase	-	-	3.00	-	3.00	0.7500	4	-	4.00	5.00	5.00	14.00	0.7679	9	-5	25	
20	Interpersonal and organizational culture difference	-	-	2.00	1.00	3.00	0.8333	3	3.00	2.00	5.00	4.00	14.00	0.6786	14	-11	121	
21	lack of strong, professionally experienced and responsible client	-	-	1.00	2.00	3.00	0.9167	2	-	4.00	7.00	3.00	14.00	0.7321	11	-9	81	
22	Geological conditions	2.00	1.00	-	-	3.00	0.3333	7	3.00	7.00	4.00	-	14.00	0.5179	17	-10	100	
23	weather conditions on site	-	3.00	-	-	3.00	0.5000	6	4.00	6.00	4.00	-	14.00	0.5000	18	-12	144	
24	Absence of any risk reward plans for different parties	-	1.00	2.00	-	3.00	0.6667	5	4.00	4.00	4.00	2.00	14.00	0.5714	16	-11	121	
Total sum of d ² =																1529		
Spearman's rank correlation coefficient																$r = 1 - \frac{6 \sum d^2}{n(n^2 - 1)}$	=	0.3352

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Appendix E- Analysis of importance index and rank of integration problems by different parties

A. Analysis of importance index and rank of integration problems by contractors

No.	Major problem/s which affect the integration of major construction parties in city governance of Addis Ababa 40-60 saving houses construction projects	Extent of problems based on Scale of important problems for contractors						Rank (from contractors perspective)
		1(Not at all)	2(minor)	3(mode rate)	4(serious)	total	RII (contractor)	
13	Lack of clearly defined responsibility of each contracting party in the contract for the project	-	5.00	10.00	24.00	39.00	0.8718	1
11	Self-serving objectives; lack of co-ordination; Lack of trust and reliability among contracting parties; and disregarding contextual issues	-	4.00	13.00	22.00	39.00	0.8654	2
6	Lack of commitment by involved parties	-	4.00	14.00	21.00	39.00	0.8590	3
12	Lack of creating integrated single project team with all members located together in a project	-	6.00	13.00	20.00	39.00	0.8397	4
1	Lack of knowledge by the client about project processes and integration issues, and inadequate technical skill by the client	-	4.00	18.00	17.00	39.00	0.8333	5
9	Poor communication between relevant construction parties	-	6.00	15.00	18.00	39.00	0.8269	6
3	Inadequate preparation and planning before commencement of a project	-	9.00	10.00	20.00	39.00	0.8205	7
17	Bureaucratic client organization and greater process and administrative rules and regulations	-	9.00	11.00	19.00	39.00	0.8141	8
15	Inadequate contract and specification	-	6.00	18.00	15.00	39.00	0.8077	9
19	Lack of involvement of contractor in design development phase	-	7.00	17.00	15.00	39.00	0.8013	10
10	Insufficient design communication between consultant and owner	-	8.00	16.00	15.00	39.00	0.7949	11
7	Technical incompetence and limited personal experience of consultant	-	5.00	23.00	11.00	39.00	0.7885	12
8	Technical incompetence and limited personal experience of contractor	-	9.00	16.00	14.00	39.00	0.7821	13
5	Lack of personnel, financial and physical resources by owners, contractors and consultants for construction project relative to requirements	-	9.00	18.00	12.00	39.00	0.7692	14
18	Lack of integration management among the contracting parties by the clients	-	10.00	16.00	13.00	39.00	0.7692	14
14	Inadequate design information in the contract	-	10.00	18.00	11.00	39.00	0.7564	15
2	Unwilling and unenthusiastic participation of contracting parties	-	11.00	18.00	10.00	39.00	0.7436	16
4	Lack of integrated planning and scheduling for different contracting parties	-	13.00	15.00	11.00	39.00	0.7372	17
16	Lack of modern contracting system among construction parties (such as partnering)	-	12.00	17.00	10.00	39.00	0.7372	17
21	lack of strong, professionally experienced and responsible client	2.00	10.00	18.00	9.00	39.00	0.7179	18
24	Absence of any risk reward plans for different parties	2.00	7.00	24.00	6.00	39.00	0.7179	18
20	Interpersonal and organizational culture difference	2.00	22.00	9.00	6.00	39.00	0.6218	19
22	Geological conditions	2.00	22.00	13.00	2.00	39.00	0.5962	20
23	weather conditions on site	23.00	6.00	8.00	2.00	39.00	0.4295	21

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B. Analysis of importance index and rank of integration problems by consultants

No.	Major problem/s which affect the integration of major construction parties in city governance of Addis Ababa 40-60 saving houses construction projects	Extent of problems based on Scale of important problems for consultants						Rank (from consultant perspective)
		1(Not at all)	2(minor)	3(mode rate)	4(serious)	total	RII (consultants)	
11	Self-serving objectives; lack of co-ordination; Lack of trust and reliability among contracting parties; and disregarding contextual issues	-	1.00	3.00	10.00	14.00	0.9107	1
18	Lack of integration management among the contracting parties by the clients	-	1.00	4.00	9.00	14.00	0.8929	2
9	Poor communication between relevant construction parties	-	2.00	3.00	9.00	14.00	0.8750	3
17	Bureaucratic client organization and greater process and administrative rules and regulations	-	2.00	4.00	8.00	14.00	0.8571	4
5	Lack of personnel, financial and physical resources by owners, contractors and consultants for construction project relative to requirements	-	2.00	5.00	7.00	14.00	0.8393	5
8	Technical incompetence and limited personal experience of contractor	-	3.00	3.00	8.00	14.00	0.8393	5
1	Lack of knowledge by the client about project processes and integration issues, and inadequate technical skill by the client	-	3.00	4.00	7.00	14.00	0.8214	6
6	Lack of commitment by involved parties	-	2.00	6.00	6.00	14.00	0.8214	6
13	Lack of clearly defined responsibility of each contracting party in the contract for the project	-	4.00	3.00	7.00	14.00	0.8036	7
3	Inadequate preparation and planning before commencement of a project	-	3.00	6.00	5.00	14.00	0.7857	8
4	Lack of integrated planning and scheduling for different contracting parties	-	4.00	5.00	5.00	14.00	0.7679	9
19	Lack of involvement of contractor in design development phase	-	4.00	5.00	5.00	14.00	0.7679	9
2	Unwilling and unenthusiastic participation of contracting parties	-	3.00	8.00	3.00	14.00	0.7500	10
7	Technical incompetence and limited personal experience of consultant	-	4.00	7.00	3.00	14.00	0.7321	11
21	lack of strong, professionally experienced and responsible client	-	4.00	7.00	3.00	14.00	0.7321	11
12	Lack of creating integrated single project team with all members located together in a project	1.00	2.00	9.00	2.00	14.00	0.7143	12
14	Inadequate design information in the contract	-	6.00	5.00	3.00	14.00	0.6964	13
10	Insufficient design communication between consultant and owner	-	6.00	5.00	3.00	14.00	0.6964	13
16	Lack of modern contracting system among construction parties (such as partnering)	2.00	3.00	6.00	3.00	14.00	0.6786	14
20	Interpersonal and organizational culture difference	3.00	2.00	5.00	4.00	14.00	0.6786	14
15	Inadequate contract and specification	2.00	4.00	5.00	3.00	14.00	0.6607	15
24	Absence of any risk reward plans for different parties	4.00	4.00	4.00	2.00	14.00	0.5714	16
22	Geological conditions	3.00	7.00	4.00	-	14.00	0.5179	17
23	weather conditions on site	4.00	6.00	4.00	-	14.00	0.5000	18

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C. Analysis of importance index and rank of integration problems by regulatory body

No.	Major problem/s which affect the integration of major construction parties in city governance of Addis Ababa 40-60 saving houses construction projects	Extent of problems based on Scale of important problems for regulatory body						Rank (from regulatory perspective)
		1(Not at all)	2(minor)	3(mode rate)	4(serious)	total	RII (regulatory)	
9	Poor communication between relevant construction parties	-	-	-	3.00	3.00	1.0000	1
1	Lack of knowledge by the client about project processes and integration issues, and inadequate technical skill by the client	-	-	-	3.00	3.00	1.0000	1
5	Lack of personnel, financial and physical resources by owners, contractors and consultants for construction project relative to requirements	-	-	-	3.00	3.00	1.0000	1
6	Lack of commitment by involved parties	-	-	-	3.00	3.00	1.0000	1
4	Lack of integrated planning and scheduling for different contracting parties	-	-	-	3.00	3.00	1.0000	1
11	Self-serving objectives; lack of co-ordination; Lack of trust and reliability among contracting parties; and disregarding contextual issues	-	-	1.00	2.00	3.00	0.9167	2
3	Inadequate preparation and planning before commencement of a project	-	-	1.00	2.00	3.00	0.9167	2
18	Lack of integration management among the contracting parties by the clients	-	-	1.00	2.00	3.00	0.9167	2
8	Technical incompetence and limited personal experience of contractor	-	-	1.00	2.00	3.00	0.9167	2
17	Bureaucratic client organization and greater process and administrative rules and regulations	-	-	1.00	2.00	3.00	0.9167	2
7	Technical incompetence and limited personal experience of consultant	-	-	1.00	2.00	3.00	0.9167	2
12	Lack of creating integrated single project team with all members located together in a project	-	-	1.00	2.00	3.00	0.9167	2
15	Inadequate contract and specification	-	-	1.00	2.00	3.00	0.9167	2
2	Unwilling and unenthusiastic participation of contracting parties	-	-	1.00	2.00	3.00	0.9167	2
14	Inadequate design information in the contract	-	-	1.00	2.00	3.00	0.9167	2
21	lack of strong, professionally experienced and responsible client	-	-	1.00	2.00	3.00	0.9167	2
13	Lack of clearly defined responsibility of each contracting party in the contract for the project	-	-	2.00	1.00	3.00	0.8333	3
16	Lack of modern contracting system among construction parties (such as partnering)	-	-	2.00	1.00	3.00	0.8333	3
20	Interpersonal and organizational culture difference	-	-	2.00	1.00	3.00	0.8333	3
19	Lack of involvement of contractor in design development phase	-	-	3.00	-	3.00	0.7500	4
10	Insufficient design communication between consultant and owner	-	-	3.00	-	3.00	0.7500	4
24	Absence of any risk reward plans for different parties	-	1.00	2.00	-	3.00	0.6667	5
23	weather conditions on site	-	3.00	-	-	3.00	0.5000	6
22	Geological conditions	2.00	1.00	-	-	3.00	0.3333	7

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D. Analysis of importance index and rank of integration problems by client

No.	Major problem/s which affect the integration of major construction parties in city governance of Addis Ababa 40-60 saving houses construction projects	Extent of problems based on Scale of important problems for clients						Rank (from client perspective)
		1(Not at all)	2(minor)	3(mode rate)	4(serious)	total	RII (client)	
11	Self-serving objectives; lack of co-ordination; Lack of trust and reliability among contracting parties; and disregarding contextual issues	-	1.00	3.00	9.00	13.00	0.9038	1
1	Lack of knowledge by the client about project processes and integration issues, and inadequate technical skill by the client	-	2.00	3.00	8.00	13.00	0.8654	2
3	Inadequate preparation and planning before commencement of a project	-	2.00	3.00	8.00	13.00	0.8654	2
5	Lack of personnel, financial and physical resources by owners, contractors and consultants for construction project relative to requirements	-	2.00	4.00	7.00	13.00	0.8462	3
9	Poor communication between relevant construction parties	-	1.00	6.00	6.00	13.00	0.8462	3
7	Technical incompetence and limited personal experience of consultant	-	2.00	5.00	6.00	13.00	0.8269	4
12	Lack of creating integrated single project team with all members located together in a project	-	4.00	3.00	6.00	13.00	0.7885	5
15	Inadequate contract and specification	-	2.00	5.00	6.00	13.00	0.8269	6
2	Unwilling and unenthusiastic participation of contracting parties	-	4.00	3.00	6.00	13.00	0.7885	7
19	Lack of involvement of contractor in design development phase	-	3.00	4.00	6.00	13.00	0.8077	8
10	Insufficient design communication between consultant and owner	-	2.00	5.00	6.00	13.00	0.8269	9
8	Technical incompetence and limited personal experience of contractor	-	3.00	5.00	5.00	13.00	0.7885	10
14	Inadequate design information in the contract	-	4.00	4.00	5.00	13.00	0.7692	11
20	Interpersonal and organizational culture difference	2.00	2.00	4.00	5.00	13.00	0.7308	12
6	Lack of commitment by involved parties	-	4.00	5.00	4.00	13.00	0.7500	13
18	Lack of integration management among the contracting parties by the clients	-	4.00	5.00	4.00	13.00	0.7500	13
4	Lack of integrated planning and scheduling for different contracting parties	-	3.00	6.00	4.00	13.00	0.7692	14
21	lack of strong, professionally experienced and responsible client	2.00	2.00	5.00	4.00	13.00	0.7115	15
16	Lack of modern contracting system among construction parties (such as partnering)	-	4.00	6.00	3.00	13.00	0.7308	16
13	Lack of clearly defined responsibility of each contracting party in the contract for the project	1.00	4.00	6.00	2.00	13.00	0.6731	17
17	Bureaucratic client organization and greater process and administrative rules and regulations	-	4.00	8.00	1.00	13.00	0.6923	18
24	Absence of any risk reward plans for different parties	2.00	7.00	4.00	-	13.00	0.5385	19
23	weather conditions on site	7.00	3.00	3.00	-	13.00	0.4231	20
22	Geological conditions	8.00	3.00	2.00	-	13.00	0.3846	21

