



**ST. MARY'S UNIVERSITY
SCHOOL OF GRADUATE STUDIES**

**FACTORS AFFECTING THE TIMELY COMPLETION OF 40/60
HOUSING PROJECT: THE CASE OF AYAT CONDOMINIUM
SITE, ADDIS ABABA**

**By
BINIYAM HAILE**

**DECEMBER, 2019
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**A THESIS SUBMITTED TO ST.MARY'S UNIVERSITY, SCHOOL
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DECLARATION

I the undersigned declare that this Thesis is my original work, prepared under the guidance of Dr. Maru Shete. All sources of materials used for this Thesis have been duly acknowledged. I further confirm that the thesis has not been submitted either in part or in full to any other higher learning institution for the purpose of earning any degree.

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December, 2019

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ACRONYMS AND ABBREVIATION

AASHDE	Addis Ababa Saving Houses Development Enterprise
AAIHDP	Addis Ababa Integrated Housing Development Program
MWUD	Ministry of Works and Urban Development
PM	Project Management
PMI	Project Management Institute
SPSS	Statistical Package for Social Science
ANOVA	Analysis of Variance

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ABSTRACT

The main aim of the study is to investigate the factors affecting the timely completion of the 40/60 housing project: the case of Ayat condominium Site, Addis Ababa. Specifically the study aimed at testing the relationship between the independent variables (project planning and scheduling, project monitoring and control, appropriate usage of PM tools and software packages and communication between client, consultant and contractors and the dependent variable (timely completion). In conducting this, the study adopted mixed method (quantitative and qualitative) research approach with casual and explanatory research design. The target populations of the study are professionals from contractors, consultants, and clients of the 40/60 condominium housing projects that are currently under way in the Ayat sites of Addis Ababa. The target population was hundred seventy-two which were sampled. The ninety-three questionnaires were distributed to the key informant (professionals) of clients and consultants and contractors. The selection of respondents was made using stratified sampling technique. Out of the distributed questionnaire eighty six respondents properly responded. Both descriptive and inferential statistics were used to see the factors affecting the timely completion of the 40/60 housing project of the Ayat condominium site. By the findings, out of the proposed four factors in affecting timely completion of the 40/60 housing project in the case of Ayat condominium site, the four factors namely; planning and scheduling, monitoring and control, appropriate usage of project management tools and Software packages and good communication between client, consultant and contractors were found to be statistically significant.

Keywords: Timely completion, housing construction project

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

This chapter presents the general overview about how construction projects encounter the problem of delay or time overrun. Obviously, effective execution of project management system contributes for solving this problem. This introductory chapter raises issues related with timely completion of project, definition about timely completion, concept of project management and its different aspects.

The success of construction project depends on the achievement of the main objectives of time, quality and cost. As it is mentioned above implementation of effective project management system has a great contribution to achieve those objectives. The task of implementing the system is the concern of all parties participated in the construction projects mainly client, consultants and contractors. Project duration, expected costs and quality of project outputs are sources to a careful planning and checking process; these are the primary elements of projects.

These are also interdependent constraints, acting in such a way that if one of them is optimized, the remaining two are adversely influenced; in fact, if a compressed schedule is envisaged, costs will tend to increase and quality will tend to decrease. The best overall result can be achieved by a careful and balanced view of all the aforementioned project variables (Pica, 2015).

Even though, this study specifically focuses on the issues of time it is important to define the other concerns of project management such as cost, scope, quality and schedule. Cost (budget) is a clear picture of financial resources available to complete the project. Scope is the magnitude or size of the project.

Quality is acting measure of conformance to specifications. In construction projects, quality has two aspects: Initially, the one is that of the function of the completed project as the client purpose; the second deals with the details inclusive in producing this result (Kabirifar and Ghafourian ,2014).

A schedule is a plan showing when activities or accomplishments will be started and/or completed (Harold, 2009).

To begin with the focus area of study time is the crucial element in the project management since every project has its own definite time frame to start and to come to an end.

All projects are time-bound. Time is the essence of all contracts. The project time objective specifies the project completion time and all the project activities are directed towards achievement of the project time objectives (Kohil and Chitkara,2012).

Timely project Completion is the projected completion time as in the contract for the construction of the project (Munano, 2012). Construction time has always been used as a benchmark for assessing the performance of a project and the efficiency of the implementing organization.

The most commonly used definition is presented by O'Brien (1976) as the delay in time either beyond the agreed contract deadline or beyond the date the parties have agreed upon for the delivery of a project. The second definition was proposed by Stumpf (2000), and stated that a time overrun is an act or event that extends the time to perform the task beyond the agreed contract deadline.

Timely completion is an important aspect in determining project success. However, public construction projects are frequently behind schedule due to various factors. Time overrun occur when the actual progress of a construction project is slower than the planned schedule. On time project completion is the result of effective project management. The fact that project time management is the approach and process in achieving successful project completion within the scheduled time.

Heagney (2012), discussed that project management is application of knowledge, skills, tools, and techniques to project activities to achieve project requirements. Project management is accomplished through the application and integration of the project management processes of initiating, planning, executing, monitoring and controlling, and closing.

Project management is facilitation of the planning, scheduling, & controlling of all activities that must be done to meet project objectives (Lewis (2004). Project management is the art of directing and coordinating human and material resources throughout the life of a project by using modern management techniques to achieve predetermined objectives of scope, cost, time, quality

and participation satisfaction (Ilveskoski&Niittymäki, 2015).

As many scholars agreed project management includes different knowledge areas such as project cost management, project scope management, project time management, project procurement management, project risk management, project report management, project HR management, project quality management and project integration management.

As it is mentioned above project time management is one aspect of PM. According to KohilandChitkara (2012), project time management aims at accomplishing the project completion time objectives, by developing a project time schedule for systematic and timely execution of works, by applying corrective measures in the event of deviations from time schedules, so as to ensure its timely completion.

Time management is important in any construction project. Without proper time management, many problems will occur such as extension of time or time overrun. Some of the researchers describe time overrun as delay and some of them describe that the time overrun is an effect from the construction delay, no matter what it was described, time overrun become the most general problem in construction industry worldwide (Zainun, et al., 2011).

One of the major challenges of Addis Ababa city is lack of shelter and unemployment as identified by city administration of Addis Ababa, which needs an urgent remedy. In order to solve these challenges, the city administration has established an integrated housing development program which has to be planned to change the image of the city, to modernize the life style of the society, and to promote the construction industry (MWUD, 2010).

In 2004 E.C, the City government launched the Addis Ababa Integrated Housing Development Program (AAIHDP) to alleviate housing shortage (UN-HABITAT, 2011). The major purpose of housing program is primary to satisfy the housing need of the public in connection to creating cities that are free from slums in the near future. The 40/60 housing program is one among the projects that are mainly aimed at building condos that are up to 24 upstairs in length and build the city to be one among the major cities in the world (Ethiopian Herald, 2016).

The program comprises of four different schemes based on percent of advance payment modalities such as 10/90, 20/80, 40/60 and housing association. According to AASHDE report

(2011), the 40/60 housing construction has 14 sites with nine topologies, i.e., B+G+7, B+G+8, B+G+9, B+G+10, 2B+G+12, 3B +G+12, 2B+G+13, 2B+G+15 and 2B+G+18. Total number of Blocks 355, Total number of housing units 38,342. One bedroom 5,290, two-bed room 16,252, three bedroom 7,844, shops 8956.

On 2017, there are 1,292 housing units located in SengaTera and Crown Hotel (Kality) were completed and transferred to the beneficiaries during the first round 40/60 houses. The construction in the 14 sites is in progress to be completed. All the houses in all sites are being transferred to the beneficiaries. The percentage of completion differs from site to site.

According to AASHDE report (2011), 136 contractors having first to third level ranks and eleven consulting organizations are participated in 14 different sites on the 40/60 housing development program.

1.2 Statement of the Problem

On time completion is one of requirements for all construction projects. Unfortunately, in reality many projects are becoming issue among stakeholders in the construction industry.

Various sources indicate that most construction projects suffer from time overrun. For example, studies carried out in Saudi Arabia found that only 30% of the construction projects were completed within the scheduled completion dates and that the average time overrun was between 10% and 30% and in Nigeria, the performance of the construction industry was found to experience time over runs such that 7 out of 10 projects surveyed were not completed on time (Muller & Turner, 2007).

Kikwasi (2012), investigating the causes of delay and disruptions in construction projects in Tanzania, through questionnaire found that only 22%, 30% and 44% of the projects were completed on estimated time according to clients, consultants and contractors respectively while the maximum time overrun was 78%, 70% and 56% for clients, consultants and contractors respectively.

Similarly in Ethiopia, it is observed that there have been time overruns in housing construction projects. In general in the four years plan of 2006/07 to 2009/10, it was planned to construct 400 thousand housing units out of which the construction of more than 150 thousand housing units was completed (MWUD , 2010).

No .	List of Practices	Measure	No. of Blocks	No.of House	Sene 2010 Reached status	Yearly plan	Yearly Accomplishment	Accomplishment (%)	Current Status
1	Bole Ayat	%							
1.1	Site-1	%	14	560	68.27	31.73	11.15	35.14	79.42
1.2	Site-2	%	38	2834	70.07	29.93	8.47	28.30	78.54
1.3	Site-3	%	34	1798	73.56	26.44	15.14	57.26	88.70
1.4	Site-4	%	36	3466	70.91	29.09	8.78	30.18	79.11

Table 1-1.Construction progress of Bole Ayat 1(Site1,2,3&4) (Selectively taken from the 2011 E.C Budget Year Construction Executions Report (Source: AASHDE, July2011 Report-translated from Amharic Version).

As per commercial bank of Ethiopia report, 156,932 people are registered for 40/60 saving housing units in August 2013(capital newspaper, 2015). As evidence shows in the above-specified year based on the rate of construction, it might take decades to deliver the houses fully to the registered public under the 40/60 housing scheme. The housing projects under the 40/60 scheme in Addis are lagging behind their contracted schedules.

The housing construction projects have not been completed at the set time. In view of these observations, there is a need to carry out a study on factors influencing the timely completion of the project.

As stated in Bekele’s study (2018), there were a lot of studies conducted internationally and locally focusing on factors influencing housing projects delay. Number of factors that were believed to contribute to the delay of construction projects, for example Zewdu (2016); Desse (2016); Kusakc, Ayvaz, and Bejtagic (2017); Seboru (2015) ;Kariungi (2014) and Wong and Vimonsatit (2012).

Hence, most of the researches focused on identifying major factors of delay or focus on determinants of construction projects delay. Most recent studies conducted on condominium housing both 20/80 and 40/60 schemes can be an evidence for this. As an example, the study conducted by Desse (2016) focus on identifying the major causes to the delay in the construction of 40/60 saving houses project in Addis Ababa. In addition, the study conducted by Bekele (2018) focus on determinants of construction projects delay on case of 20/80 condominium.

Despite many research conducted on finding out the factors for delay of construction in Ethiopia the problem of delay of projects continue. The construction of projects continues to be described as delaying for instance Getnet (2017); UN-HABITAT (2011) and Capital News Paper (2016).

This research focused on examination of the factors affecting timely completion of the 40/60 housing projects. It attempted to investigate the relationship between factors in determining the timely completion. The study focuses on how the timely completion of the 40/60 projects can be explained by those factors.

This research has, therefore, focused on examination of the factors of project timely completion by taking consideration of the case of 40/60 housing project in Aayat site, Addis Ababa.

Construction delays are normally caused by the contractual parties such as, client, contractor and consultant or factors beyond the control of the parties or force majeure (Alhaji&Danladi, 2012).

The issues of delayed housing delivery of the Addis Ababa condominium projects were apparent since over the past years. The motivating factor to undertake this research that in 2013 around a million residents of Addis Ababa registered for the 10/90, 20/80 and 40/60 condominium housing schemes and began to deposit in the state-owned Commercial Bank of Ethiopia (CBE) the minimum saving required under each scheme. The promise from the city administration was to handover the houses to the beneficiaries within 3 years delivery time to 40/60 category and 5 years delivery time to 10/90 and 20/80 categories.

The vast majority of those who enrolled in the program in 2013 are bitterly awaiting the keys to the houses as the matter of fact they had been given a promise to receive the houses within 3 years. Even these citizens have no idea as to when the construction of the condominiums would be completed or when they would be handed over to them. Due to many reasons such as the

absence of the required housing project management knowledge, the poor execution capacity of the management and staff of the executing government agencies as well as ethics-related problems and inadequacy of funds program is way behind schedule (Reporter Newspaper, 2017).

Addis Abeba's housing project under the 40/60 scheme are lagging behind their contracted schedules. This is evidenced by the Addis Abeba Saving House Development Enterprise's delay in delivery of the initial phase, which was scheduled for June 2015. The 1,292 houses at the Sengatera and Crown sites, in the Lideta and AkakiKality districts, had reached 86% and 84% completion, respectively, at the time they were expected to be fully completed. Construction at the Asko, EhelNigid and HintsAkrabi sites, however, still sits at only 38%, 64% and 55% completion. This is despite the fact that their scheduled completion dates have long since passed (Fortune Newspaper, 2018).

The 17,737 Houses construction began in seven sites in different times. These are: Asko, EhilNigid, HinsaAkrabi/Imperial/,MeriLoque, Bole Bulbula 1,Bole Ayat 1 lot 1,2,3 and 4,Bole Bulbula 2 .Their completion reached in different level. The Package 2 the 17,737 Houses Construction Executions (AASHDE, 2011).

Package 3 the 20,503 Houses Construction is undergoing in 8 divided sites. These are: BoleBeshale, BoleBulbula 2,Summit,Asko,BoleAyat 1 site 3 & 4,Tourist & ,BoleAyat 2. Their construction accomplishments are in different level(AASHDE, 2011).

Generally, on the budget year Package 2 occupied 17,737 Housing construction Executions on average 23.55% planned to be accomplished but possibly done 10.53 percent. The package 2 Construction Execution was planned to be accomplished 100% up to the end of the Budget year but possibly done 86.98 percent. (AASHDE, 2011).

On the other hand, on the budget year, package 3 comprises 20,503 houses construction execution that was planned to be accomplished on average 39.93% but possibly done9.77 percent (AASHDE, 2011).

Based on the housing construction execution, both the package 2 Housing construction, which includes 17,737 Houses, and package 3 Housing construction that includes 20,503 did not accomplished in their scheduled time.

It was planned that package 2, 17,737 housing construction to be done on average 13.02(55.29%)and package 3, 20,503 Housing Construction to be done on average 36.16(75.53%) but they are accumulated works that were not done. For this fact this shows there is a delay in the construction process (AASHDE, 2011).

This research targets on examining the factors influencing for timely completion of 40/60 housing project. Time issues will be examined in light of effective project time management. The fact that effective project time management has a great role in achieving successful project completion in terms of project completion.

In general, this research will try to assess the factors influencing for timely completion of 40/60 housing project from project time management perspective. It tries to examine how the knowledge, methods, techniques, process and principles are effectively applied within the entire project management system of the client (owner), consultants and contractor. These three parties sign a contract document between them. These three are the major actors in determining the project completion. In other words, it will analyze the efficiency of project management from the contractor, client and consultant sides.

1.3 Research Objective

1.3.1 General Objective

The main objective of this research is to identify the major factors affecting the timely completion of 40/60 housing project related with client, contractor and consultant.

1.3.2 Specific Objectives

In order to handle the research questions and realize general objective stated above, the study deals with the following specific objectives:

- To assess the role of project planning on timely completion of the housing project.
- To assess the role of project scheduling on timely completion of the housing project.
- To examine the influence of project monitoring on timely completion of the housing project.
- To examine the influence of controlling on timely completion of the housing project.
- To assess the impact of communication b/n client, consultant and contractors on the

40/60 housing project.

- To evaluate the practice of project management tools of the housing project.
- To assess the practice of software packages of the housing project.

1.3.3 Research Questions

In order to achieve the research objectives, the following four main questions will be addressed:

1. What do the existing practice of project planning of the housing project look like?
2. What do the existing practice of project scheduling of the housing project look like?
3. What do the existing practice of project monitoring look like in the housing project?
4. What do the existing practice of project controlling look like in the housing project?
5. To what extent the project a management tool is applied in the housing project?
6. To what extent the software packages are applied in the housing project?
7. How do the communication between the parties affect the housing project?

1.4 Research Hypothesis

Based on the research objectives set above, the following hypotheses were formulated to be tested:

1. H1: Project planning and scheduling affect the timely completion of housing projects.
Ho: Project planning and scheduling do not affect the timely completion of the housing projects.
2. H2: Project monitoring and controlling affect timely completion of the project.
Ho: Project monitoring and controlling do not affect timely completion of the project.
3. H3: Project management tools and software packages affect the timely completion of the project.
Ho: Project management tools and software packages affect the timely completion of the project.
4. H4: Good communication between the three parties (client, consultant and contractor) affects the timely completion of the project.
Ho: Good communication between the three parties (client, consultant and contractor) does not affect the timely completion of the project.

1.5 Scope and Limitation

There are some limitations to the study. Firstly, the research population is too large to cover in the limited time given thus sampling is required which might have an impact on the general output of the study. Secondly, the data collection is limited in the sense that the respondents are the main participants of the project such as Client, Contractors and Consultants. Thirdly, the research specifically covers Ayat Site of 40/60 as a target area. Fourthly, it conceptually limited since it focus on the efficiency project management in respect to timely completion.

1.6 Significance of the Study

Identifying factors that lead to delay in timely completion of 40/60 housing project will help the three parties of the construction projects namely the client, contractors, and consultants to identify their weak sides, which hinder achievement of their goal for timely completion of the project.

Moreover, as construction industry has an enormous impact on economic development, improving the capacity building of the project parties will have an impact on improving the sector, which in turn affects the economy of the country positively.

It is hoped that this study will increase awareness of the program in delayed project. Then if corrective measures are taken, it will ensure sustainability of the program in completing projects within the specified time limit of the housing project in Addis Ababa.

1.7 Organization of the Thesis

This thesis is organized in to five chapters. The first chapter is the introduction. The second chapter presents the review of related literature. In the third chapter, the research methodology is presented. Chapter four presents data presentation, analysis, and discussion of the study. The last chapter describes summary, conclusion and recommendation the conclusions and recommendations of the study.

CHAPTER TWO

RELATED LITRATURE RIVEW

2.1 Theoretical Literature Review

The issue of timely completion of project is one of indicator of a project success. As the experience of many countries tells us the construction industry faces the challenge to accomplish projects according to the specified schedule. The success of a project is measured in terms of timely completion, cost, and quality. Some projects, which are properly planned and managed, are successfully completed. However, many projects are delayed due to causes related to the owner, the contractor, the consultant or factors related with material, labor, equipment and other external factors.

This study is interested in identifying those factors only related with the client, consultant and contractors of the project participant of the 40/60 housing projects. The objective of this chapter is to review various literatures related to project delay so as to have an input to the undertaking of this research, which is aimed at identifying major factors affecting the construction of 40/60 saving housing project in Addis Ababa.

The literature review includes introduction about factors or causes of delay found in different countries. Moreover, overview of construction management followed by conceptual analysis about project planning and scheduling, project monitoring and controlling, and the application of project management tools and techniques and software packages, the role of communication and collaboration among the project main participants.

2.1.1 Construction Project Management

Construction management or construction project management (CPM) is the overall planning, coordination and control of a project from beginning to completion. The management of construction projects requires knowledge of modern management as well as an understanding of the design and construction process. Construction projects have a specific set of objectives and constraints such as a required time frame for completion (Ilveskoski&Niittymäki, 2015).

The purpose of construction project management is to plan, coordinate and control the application of project objectives in the most effective way according to stakeholders' needs

(Harris and McCaffer, 2013). It involves many processes and sub-processes and includes the definition of project scope, cost estimating, roles and responsibilities of the project team, project stakeholder management, as well as the utilization of planning and control methods and tools (AlNasseri, 2015).

2.1.2 Project delay causes

The delays on the delivery of construction projects are seen as one of the most frequent problems in the construction industry (Al-Karashi and Skitmore, 2009).

Delay in progress payment by owner, contractors cash flow problem, improper planning and scheduling, poor site management, change order by owner during construction, due to improper contract management and some other unexpected events. There are other factors for project delay for example, the country's general economy, inflation of resource price, environmental factors and lack of managerial service (Saiful and Trigunarsyah,2017).

Saiful and Trigunarsyah (2017), discussed that there are delay factors, which hinder the completion of projects within the specified time. These are categorized as: financial reasons, managerial problem, issues related with manpower and resource, project related problem, issues associated with the owner, cases associated with the consultant and external factors.

Sambasivan and Soon (2007) have identified the 10 most important causes of delay in Malaysia through a questionnaire survey. The questionnaire survey was carried out with clients, consultants and contractors. About 150 respondents participated in the survey. Based on their survey results, the most important delay factors were: contractor's improper planning, contractor's poor site management, inadequate contractor experience, inadequate client's finance and payments for completed work, problems with subcontractors, material shortage, labour supply, equipment availability and failure, lack of communication between parties, and mistakes during the construction stage.

A similar study in Malaysia was carried out by Alaghbari et al. (2007) with a list of 31 delay factors. The major delay factors from their survey results were: financial difficulties and economic problems, contractor financial problems, late supervision and slowness in making decisions, material shortages, poor site management, construction mistakes and defective work,

delay in delivery of materials to site and lack of consultant's experience.

Chan and Kumaraswamy (2002), conducted a survey in Hong Kong to determine and evaluate the relative importance of the significant factors affecting the construction delays. They analysed and ranked the main factors affecting the construction time, and classified them into two groups: the role of the parties in the local construction industry and the type of projects. Based on their survey results, they indicated that the five major causes of delays were: poor site management and supervision, unforeseen ground conditions, low speed of decision making involving all project teams, client initiated variations and necessary variations of works.

Fugar and Agyakwah-Baah (2010) also studied the causes of delays in building construction projects in Ghana. They identified 32 possible causes of delay and further categorised into nine major groups. The list of the causes of delay was conducted into a questionnaire survey, which included 130 respondents who participate in the survey. Based on their analysis, they concluded that the delay in honouring certificates, underestimation of the costs of projects, underestimation of the complexity of projects, difficulty in accessing bank credit, poor supervision, underestimation of time for completion of projects by contractors, material shortage, poor professional management, fluctuation of prices/rising cost of materials and poor site management were found to be the top ten most important factors affecting the construction time.

The study of El-Razek et al. (2008) was carried out to determine the causes of delay in building construction projects in Egypt. A questionnaire survey was carried out to confirm the causes and identify the most important delay factors. Based on the survey results, the top five delay causes were: financing by contractor during construction, delays in contractor's payment by owner, design changes by owner or his agent during construction, partial payments during construction and non-utilization of professional construction management.

Sweis et al. (2008) in a similar study carried out in Egypt, also concluded that financial difficulties faced by the contractor and too many change orders by the owner are the leading causes of construction delay. Both research outcomes showed that financial difficulties were important factors causing delays in Egypt. This factor will be included in the questionnaire survey of the present research to determine the severity on the Western Australia's construction industry.

Tumi et al. (2009) studied the delays in construction project in Libya. They concluded that the main causes of delay in construction projects were improper planning, followed by lack of effective communication, material shortage, design errors and financial problem.

Alwi and Hampson (2003) had a similar study on the causes of delays in building construction projects in Indonesia. A questionnaire survey was carried out targeting only the contractors. The respondents were asked to assess the effects of the 31 potential delay factors on their projects. The delay factors were grouped into six major groups. The results showed that the top five most important delay causes were: slow decision making, which was ranked the highest, followed by design changes, poor distribution of labour, inappropriate construction methods, and poor coordination among project participants.

Pourrostan&Ismail (2012) studied causes and effects of delay in Iranian construction projects. Projects studied in this research comprised of residential, office and administration buildings, and roads. A questionnaire survey was conducted to identify the causes and effects of delay from 100 consultants and contractors' viewpoint. This research identified 10 most important causes of delay out of 28 different causes of delay based on their Relative Importance Index .The most important delays were delay in progress payment by client, change orders by client during construction, poor site management, slowness in decision making process by client, financial difficulties by contractors, late in reviewing and approving design documents by client, problems with subcontractors, ineffective planning and scheduling of project by contractor, mistakes and discrepancies in design documents, and bad weather.

Haseeb et al (2011) conducted research for the construction delays in Pakistan's large construction projects. They used questionnaire survey to get the data about the causes of delay and identified 16 important causes of delay based on relative importance index (RII), which were: finance and payments, inaccurate time estimation, quality of material, delay in payments to supplier and subcontractor, poor site management, old technology, natural disasters, unforeseen site conditions, shortage of material, delays caused by subcontractors, changes in drawings, improper equipment, inaccurate cost estimation, change orders, organizational changes and regulatory changes.

Ren et al (2008) identified root causes of construction project delays in Dubai. A questionnaire

survey and interviews were conducted to explore each project stakeholder's contributions to the causes of delays. The results showed that unrealistic project duration, many provisional sums and prime cost, nomination of sub-contractors and suppliers, client's irregular payment to the main contractor and variations were the top five causes of delay contributed by the client. Incomplete drawings, delay in approval of documents, incomplete contract documents, changes in drawings and specifications, and duration of inspection procedure were also the major causes contributed by the consultant. Preparing the method statements, ill-financed project, inappropriate organization management, unsmooth external and internal communications, and mistakes in construction were the top delay causes contributed by the contractor.

Desai & Bhatt (2013) studied critical causes of delay in residential construction projects of central Gujarat region of India. The delay was studied through field survey and 59 causes of delay were identified through research. The identified causes of delay were classified into nine groups as project related, owner related, contractor related, consultant related, design-related, material related, equipment related, labor related and external factors depending on their nature and mode of occurrence. The field survey included 50 respondents where 20 were developers, 17 were contractors, and 13 were consultants. This study used two different ranking techniques: Relative importance index and Importance index based on degree of severity and degree of frequency. Results showed that out of top 10 delay factors, a total of 5 delay factors were common in ranking by both methods. They were original contract duration is too short, shortage of labors, delay in material delivery, low productivity level of labors, and delay in progress payments by owner. Moreover, using both methods, labor related factors were ranked first while external factor was considered having least effect on delay, as it was ranked last.

Chan and Kumaraswamy (2002) conducted a survey in Hong Kong to determine and evaluate the relative importance of the significant factors affecting the construction delays. They analysed and ranked the main factors affecting the construction time, and classified them into two groups: the role of the parties in the local construction industry and the type of projects. Based on their survey results, they indicated that the five major causes of delays were: poor site management and supervision, unforeseen ground conditions, low speed of decision making involving all project teams, client initiated variations and necessary variations of works.

Alhaji&Danladi (2012), conducted a research on causes of delay in Nigeria construction industry. The survey method used for this research was questionnaire; the questionnaire survey included contractors, clients and consultants in the construction industry in Nigeria. The results obtained from ranking analysis show that improper planning, lack of communication, design errors, and shortage of supply were the most important causes of delays in Nigeria construction industry. The study showed that the two types of firms agreed that out of the total of 52 delay factors, the top five critical delay factors were cash flow problems, shortage of construction materials, client's financial difficulties, inadequate consultant experience, and incompetent project team.

Shebob et al. (2011) studied construction delay factors in building construction project in Libya. A semi-structured questionnaire was developed using literature. The delay factors were ranked using the frequency of occurrence and severity scale. The research study found that the critical delay factors are different in UK and Libyan construction projects due to differences in construction methodology and planning techniques used in both countries. The critical delay factors found in Libyan construction projects were low skills of manpower, changes in the scope of the project, slowness in giving instruction, poor qualification of consultant, and delay in delivering site project to contractor.

Similar to the case with other developing countries, the Ethiopian construction industry shares the problems that the industry is facing in other developing countries in relation with project delay and problem with project quality, perhaps with greater severity.

Abdo (2006) conducted a research on delays in public building construction projects and their consequences in Ethiopia through surveying 52 public building projects constructed by local Contractors in the years between 1995 and 2005. A questionnaire survey was used to collect data on delays, and 62 responses from contractors, consultants, public owners and construction professionals were analyzed using mean score method. He grouped 80 hypothesized causes of delay into six categories which included design related, management related, construction related, finance related, code related, and force majeure related causes of delay. Of these groups of delay causes, design related causes of delay were the most frequent followed by management related delay causes.

He finally identified 10 critical causes of delay in public building construction projects in Ethiopia which included scarcity of material in the market, late material supply, delayed payments to contractors, unrealistic performance schedule, change in subsurface conditions, client's finance shortage, adverse weather condition, less emphasis to planning, material and labor price escalation, and variations.

Some projects suffered delays due to lack of communication between the client, the contractor and the subcontractors. Since one single point of reference was not properly established in the project contract with reference to on-site management, the client and his technical team found it challenging to monitor different trades simultaneously. Many issues are being faced by construction industry that must be taken care of. They include time and cost overruns due to inadequate project formulation, poor planning for implementation, lack of proper contract planning and time management during execution (Thangam and Benila , 2016).

There are many factors that contributed to causes of time overrun or delay in construction projects. According to Theodore (2009) factors that contribute to the causes of delay categorized into seven groups. These are causes of delay by: client, consultant, contractor, Labor, material, equipment, external.

2.1.2.1 Causes of delay by client

There are a lot of factors or causes related with the client that affect the timely completion of project. The Client has a key influence on the outcome of a construction project, because the project is originated by the Client and pays for the work to be executed.

	Causes of delay
1	Delay in progress payments by owner
2	Delay to furnish and deliver the site
3	Change orders by owner during construction
4	Late in revising and approving design documents
5	Delay in approving shop drawing and sample materials
6	Poor communication and coordination
7	Slowness in decision making process
8	Conflicts between joint-ownership of the project
9	Suspension of work

Table 1.2 List of causes of delay related with client (Theodore,2009)

2.1.2.2 Causes of delay by contractor

The contractor is the agent of undertaking the overall construction work. This actor is the change agent in transforming the building design into the real work.

No.	Causes of delay
1	Difficulties in financing project by contractor
2	Conflicts in sub-contractors schedule in execution of project
3	Rework due to errors during construction
4	Conflicts between contractor and other parties (consultant and owner)
5	Poor communication and coordination
6	Ineffective planning and scheduling of project
7	Improper construction methods implement
8	Delays in sub-contractors work
9	Inadequate contractor's work
10	Frequent change of sub-contractors
11	Poor qualification of the contractor's technical staff
12	Delays in site mobilization

Table 1.3 List of causes of delay related with contractor (Theodore, 2009)

2.1.2.3 Causes of delay by Consultant

The consultant is responsible for performing the duty of consultancy service that helps the client.

No.	Causes of delay
1	Delay in approving major changes in the scope of work
2	Poor communication and coordination
3	Inadequate experience of consultant
4	Mistakes and discrepancies in design documents
5	Delays in producing design documents
6	Unclear and inadequate details in drawings
7	Insufficient data collection and survey before design
8	Un-use of advanced engineering design software

Table 1.4 List of causes of delay related with consultant (Theodore, 2009)

2.1.3 Contributing factors for Timely completion

2.1.3.1 Project planning and scheduling

Planning is the process of developing project plan and scheduling is the process of developing a schedule. Usually it is used with a moderator. Project planning and scheduling aim at timely execution of work. According to the project planned schedule and can apply corrective measures in case of any time deviations (Thangam and Benila, 2016).

Project planning consists of project structuring with the tasks of project scheduling and resource allocation. Whereas the aim of project scheduling is to determine start and finishing dates of project activities, the objective of resource allocation is to ensure the sufficient and timely supply of resources for project execution (Klein, 1999).

Normally, resources are not available in unlimited amount. After all, at least the most important project resources are scarce. In construction projects, these resources comprise money, labor, equipment and construction materials. The timely allocation of scarce labor and equipment to construction projects is objective of construction project planning. Thereby, the selection of the appropriate project planning method for allocation of the scarce resources labor and equipment is prerequisite for efficient project planning. Efficient is thereby described as ‘as accurately as possible, but as loose as necessary’. The result of project planning is a project schedule, i. e. a definition of a set of starting and finishing times of project activities. A project schedule is not just a valuable instrument in communication and coordination of processes with external partners in the company’s inbound or outbound supply chain. It also serves both the planning of project activities and a related resource assignment to each activity considering some measure of performance as well as the planning of external activities (Klein, 1999).

Project planning is defined as a set of established processes used to make a decision on what tasks must be performed to achieve the project’s set objectives within schedule and cost (Pierce, 2013).

A schedule is a representation of project activities identified by the work breakdown structure (WBS), as part of the definition of the project scope (Baldwin and Bordoli, 2014).

In addition, the concept of project scheduling deals with the logical sequencing of activities and

the addition of activity durations. It includes related concepts such as resource loading and tracking progress during project execution (Yang, 2007).

According to Dvir et al. (2003), there is a strong correlation between successful project planning and the success of a project from the perspective of project stakeholders.

Good scheduling represents a roadmap for project managers, planners and schedulers in monitoring and tracking critical activities and milestones during the progress of a project (Baldwin and Bordoli, 2014).

They indicated that good project planning and scheduling can provide tangible benefits for key project stakeholders. According to Baldwin and Bordoli, important benefits include: (1) the ability to forecast resource requirements and costs; (2) the ability to develop more realistic schedules with clear time deadlines; (3) the ability to communicate with clear and reliable information to project stakeholders; (4) providing reliable information for risk and opportunity assessment; (5) providing good information for monitoring and control; (6) minimizing materials wastage; and (6) providing a strong basis for team coordination and assisting in the negotiation of contractual claims.

Planning involves the breakdown of the project into definable, measurable, and identifiable tasks/activities, and then establishes the logical interdependences among them (Elbeltagi, 2012).

Planning and scheduling is the basic for every construction work. Ineffective planning and scheduling has a significant impact on construction delays. It should be developed from the start of the project until completion of a project (Koshe and Jha,2016).

Melketsedik (2017), discussed that project scheduling is created by listing the phases, activities/tasks, their dependencies, and sequencing them with the resources required to complete the project to show the time frame for the project. The main focus of scheduling is on the creation of a work plan, which provides guideline to project execution by establishing day-to-day priorities and control of the project progress, using milestones as targets. There are different types of scheduling techniques used to serve the above purpose, including: Milestone Chart, Ghant Chart and Network Diagram.

According to David (1998), Gant Chart lay out when different tasks will be implemented and Milestone Charts focus on the achievement of key results. In contrast, PERT/CPM Networks show how the different tasks are connected to each other, enabling the project team to view the project as a system comprised of interrelated parts.

2.1.3.2 Project monitoring and controlling

Monitoring and control is an essential process in construction project management and delivery. It is therefore imperative for construction companies to employ the usage of the most effective monitoring and control techniques available to meet project objectives (Adebayo et al.,2018).

Monitoring is the continuous assessment of a programme or project in relation to the agreed implementation schedule. It is also a good management tool which should, if used properly, provide continuous feedback on the project implementation as well assist in the identification of potential successes and constraints to facilitate timely decisions.

According to Otieno (1999), monitoring is not only concerned with the transformation of inputs into outputs, but can also take the following forms:

Physical and financial monitoring

Measuring progress of project or programme activities against established schedules and indicators of success.

Process monitoring

Identifying factors accounting for progress of activities or success of output production.

Impact monitoring

Measuring the initial responses and reactions to project activities and their immediate short-term effects. Projects are monitored so as to:

- Assess the stakeholders' understanding of the project;
- Minimize the risk of project failure;
- Promote systematic and professional management; and

-Assess progress in implementation.

Monitoring the project progress is another key process in project success. Good monitoring system can validate the performance of the project and solve any issues faced to follow the planned schedule (Singh, et al., 2015).

Project monitoring and control process is done to make sure everything goes according to plan. In other words, it identifies discrepancies, handles change management, and provides feedback to update and progressively elaborate the plan (Jack, et al., 2016).

To put formally, a project monitoring and control system works to minimize the deviations from the project plans and consists of identifying and reporting the status of the project, comparing it with the plan, analyzing the deviations, and implementing the appropriate corrective actions (Adebayo, et al.,2018).

Control the act of comparing progress to plan so that corrective action can be taken when a deviation from planned performance occurs. This definition implies the use of information as the primary ingredient of control, rather than power. Thus, we talk about management information systems, and, indeed, these are the essence of what is needed to achieve control in projects (Heagney,2012).

Project controlling involves cost /budget control, quality control, progress control, waste control. Waste control may comprise of plant and equipment and material control.

According to PMI (1996), cost control is concerned with (a) influencing the factors which create changes to the cost baseline to ensure that changes are beneficial, (b) determining that the cost baseline has changed, and (c) managing the actual changes when and as they occur. Cost control includes:

- Monitoring cost performance to detect variances from plan.
- Ensuring that all appropriate changes are recorded accurately in the cost baseline.
- Preventing incorrect, inappropriate, or unauthorized changes from being included in the cost baseline.
- Informing appropriate stakeholders of authorized changes.

Quality control is considered to be the process of testing and inspecting material and workmanship for compliance with the specifications and the applicable codes. This process is also impacted by the type of organization, contract format and the project life cycle. Quality control may be studied in a lump sum contract environment and within the execution and finish stages of the project life cycle. Also, quality control is highly related to both cost and schedule functions. Furthermore, quality may be considered as a product of cost and schedule control (Atalla, 1996).

On the other aspect of change or progress the following statement can give explanation. As Adebayo, et al. (2018) discussed changes are inevitable and need to be managed during project life cycle. An effective change control system should be established to ensure change procedure is clear and unambiguous and easy for employee to request a change. According to Voropajev (1998), the following things need to be concerned:

- a. Monitoring and forecasting key factors that generate change to ensure good results
- b. Ensuring that change is beneficial
- c. Request for change must be checked by suitable person before being approved
- d. Changes should take place once it is approved and be monitored to check whether it worked as expected
- e. All changes in project should be recorded in the project documentation

The other side project control system is waste control. Waste can be different in kinds.

Waste in construction has been defined in different ways by different studies. According to the new production philosophy, waste should be understood as any inefficiency that results in the use of equipment, materials, labour, or capital in larger quantities than those considered as necessary in the production of a building. Waste includes both the incidence of material losses and the execution of unnecessary works, which generates additional costs but do not add value to the product (Polat and Ballard, 2004).

Materials control includes those activities that ensure materials availability in the required quantity, at the proper time, considering the minimum feasible cost to satisfy production needs and corporate objectives. Materials control activities include determining materials needs,

requisitioning the purchase or fabrication of components based on make or buy economics, record keeping, requisitioning for production and status reporting procedures (Manteau, 2010).

2.1.3.3 Appropriate usage of modern PM tools and software Packages

Project management is the application of knowledge, skills, tools, and techniques to project activities in order to meet or exceed sponsors' needs and expectations. Project time management is one of the fields that includes the processes which required success in order to complete projects on time so these processes are being affected by other factors (Ebrahimpour , et al.,2011).

Time control is one of the keys to effective project management as weaknesses in the time management will cause delays in project completion (Kerzner, 2009).

Hence, time in construction projects need to be controlled from the beginning of the construction process until the project is totally completed. There are several techniques or methods commonly used for managing time like Gantt Bar Chart, Critical Path Networks/Method, Milestone Date Programming Techniques, Program Evaluation and Review Technique (PERT), and Elemental Trend Analysis/Line of Balance (LOB). With the rapid development in computer technology, the adoption and use of Project Management software have grown rapidly. The main motivation behind this is the strong interest; professionals in this field have, in improving their performance by using available technology for better project planning and control (Ali, 2008).

There are significant numbers of Project Management (PM) software available with wide range of features, functionalities and prices. These soft wares are aimed to facilitate the project management process as well as to assist project managers to solve problem related with project scheduling, monitoring, controlling and sharing information.

As identified by Ali (2008) the choice of suitable PM software can depend upon various aspects like, ease of use, functionality, information quality, size of organization, project size, project complexity, and other user characteristics such as, level of education, training and experience.

Among the many available project management software tools Primavera, Project Planner, Microsoft Project, and Deltek Open Plan are the commonly used scheduling and management

software packages in the construction industry.

2.1.3.4 Good communication between client, consultant and contractors

Effective project communication is critical to the success of any project because it ensures that the right stakeholders have the right information at the right time, which enables them to make informed about the project (Melketsedik, 2017).

Healthy relationships between parties contribute to the well-being of the project. The ability to manage relationship is an added advantage to a firm (Bolton and Tarasi, 2007). According to Wasti et al. (2006), relationships between parties to a contract has now transformed from fierce competition to a win-win situation. Harmonious living among client and architects are based on active ingredients such as fairness, trustworthiness, conformance to the terms of contract (Soetanto et al., 2001), client satisfaction, fairness, communication and preference of brand (Bolton and Tarasi, 2007).

Every (1942) opined that, there is an ever-increasing conflict between contractors and clients because of unprofessionalism, mistrust and unfairness displayed by the former. However, was quick to add that, satisfaction of the client most importantly is breeding grounds leading to better and healthy relationship between the client and contractor. Additionally, involving the contractor at the developmental stage of the project is an added factor of establishing stronger bond between the client and contractor.

There are many reasons for one actor to contact another actor. The most common reason is to coordinate, plan and schedule the work. The actors expected this reason to be one of the most important and they wish it to remain the most important reason in the future. It was a surprise for the actors that the second most common reason for communication was to give information or documents. They wish to reduce this type of information exchange in the future. Other common reasons for communication were to give or to receive explanations because of changes. It is easy to understand that the actors would like to reduce this type of communication in the future. Instead they wish to communicate more for the purpose of receiving information about decisions, determining level of ambition and exchanging knowledge with other actors (Josephson and Larsson, 2001).

Regarding the methods of communication the richest methods are face-to-face contact, telephone and formal group meetings. These are also the most used methods of communication in building projects.

Meetings and telephone conferences are the most frequently used methods of communication. There is a wish to increase the use of electronic mail and other IT-tools.

2.2 Empirical research review

Causes of delays are factors or events that occur before and during the construction process that will affect the time of completing a project. Ali et al. (n.d) states that here are 4 factors of delay categorized in broad categories, namely contractor- related factors, consultant-related factors, client-related factors and external factors. Motaleb and Kishk (2010), identifies at least five factors that can cause time overrun and these include change orders, slow decision making by client, lack of capability of client representative, construction financial difficulties and late delivery of materials. Further, Sambasivan and soon (2007), Assaf and Al-Hejji (2006), Wei (2010) and Theodore (2009) identified seven categories of causes of construction project delays and grouped them as follows; owner related, contractor related, consultant related, material related, equipment related, labour related and causes by eternal factors.

According to Koshe and Jha (2016), the research first identified 88 key factors causing delay in Ethiopian construction industries, and then the most common and critical causes of construction delay were evaluated by using both the data collected in a survey of construction managers, resident engineers, contractors, and clients, and interviews with senior professionals in the field. The findings show that the main critical factors that cause construction delays in Ethiopia are: (1) Difficulties in financing project by a contractor; (2) Escalation of the materials price; (3) Infective project planning; (4) Scheduling or resource management; (5) Delay in progress payments for completed works, (6) Lack of skilled professionals in the field of construction management in the organization, and (7) Fluctuating labor availability season to season /Seasonal labors availability. This study shows that in Ethiopia only 8.25% projects have been finished to the original targeted completion date. The remaining 91.75% delayed 352% of its contractual time. This paper finally came up with solutions towards reducing the impact of delays on construction projects in Ethiopia.

It is purposely the researcher consider project delay factors as a base for the study undertaking. Because, it is difficult to investigate the factors affecting timely completion without the concern of project delay factors. In other words, the factors contributing or determining the timely completion are the result of action could be taken on the identified delay causes of project. So, it reasonable to raise here the empirical findings of delay factors for the examination of factors affecting timely completion of housing project.

Factors affecting for timely completion of housing project can be explained in terms of avoiding identified project delay causes. Taking corrective measures on delay causes of the housing project means identifying factors contributing for timely completion.

Past research finding on 20/80 condominium project justifies the above statement in the sense that taking corrective measures on project delay factors leads to contributing factors for timely project completion. The following research finding on 20/80 condominium project explains the issue clearly.

In relation to the existence of weak coordination and poor planning of construction projects in the study sites, the city government, constructors, construction supervisors, and other concerned stakeholders should work in cooperation and maintain project synergy in order to achieve the common goal (maintaining successful project accomplishment)(Dawit , 2018).

According to Dawit (2018), the study finding show that most of the contractors' planning experience is below the standards and this influences the rate of projects completion. In addition, authorization experience and channels used by the contractor and the evaluation procedures experience held by the contractor influence projects delays. Hence, it is recommended that the city government should be strict in providing bid to constructors in that it must consider the experience of constructors and maintain minimum standards.

Similarly, the Addis Ababa Housing Development Project Office and Consultants should work jointly keeping the hierarch of authority intact, should be strict in monitoring and controlling the quality of constructions, and delay of projects. There should be effective monitoring systems where by all stakeholders engage in controlling the quality and timely of projects. The represented clients should supervise consultants and consultants should work effectively to

ensure projects are successfully implemented (Dawit,2018).

The office should also strengthen the communication system, which can maintain proper flow of information among sub-city administration, consultants, constructors, and city government. There should be proper feedback system, which works to ensure feedback on performance, and demands are actively reach stakeholders for remedial actions. In relation to the poor decisions making from the supervisors leading to project delay, supervisors should be well trained and oriented by the city government/ sub-city administration to develop their decision-making skills. This in turn helps them to make timely and right decision regarding the activities of construction projects (Dawit,2018).

In the case of 40/60 housing project previous study reveal that time control mechanism contribute for timely completion.

It is known that on time completion of a project is one of the criteria for the success of a construction project. To check the status of a project and to take the necessary measures, time control should always be conducted throughout the project life cycle. As per the data obtained, time control is always applied by only 25.64% of the professionals. This indicates that most professionals will not be able to take timely corrective measures in order to achieve the target related to project time (Shimelis, 2018).

2.3 Conceptual framework

Conceptual Framework according to Mugenda&Mugenda (2003) cited in Sawega (2014), a conceptual framework is a diagrammatical representation of hypothesized relationship between Independent and dependent variables of the study. From the literature reviewed Proper project planning and scheduling, Effective project monitoring and controlling, Ensuring capability of contractors and Consultant, application of modern construction project management Tools and software packages, good communication between client, consultant and contractors are the Independent variables that make project timeliness more likely while the dependent variable was timely project completion.

This study was guided by a theory called general systems theory. According to (Murithi, et al., 2017), General Systems Theory (Lloyd Bertalanffy 1971) asserts that a system is a collection of parts unified to accomplish an overall goal. If one part of the system is removed, the nature of the system is changed as well. For example, a functioning car is a system if you remove the carburetor you no longer have a working car. A project can also be viewed as a system with inputs, processes and outputs. Any project success is dependent on the harmonious interaction of its parts and therefore the project team must be able to put this into perspective. Improvement methods by Memon et al (2013) indicates that failure of different parties to a project to work seamlessly leads to infighting that eventually derail the completion of a project.

Based on this theory as far as project management considered as a system in achieving the timely completion of projects the whole parts of the system taken in this research are: planning and scheduling, monitoring and control, application of PM tools and software packages and good communication between client, consultant and contractors.

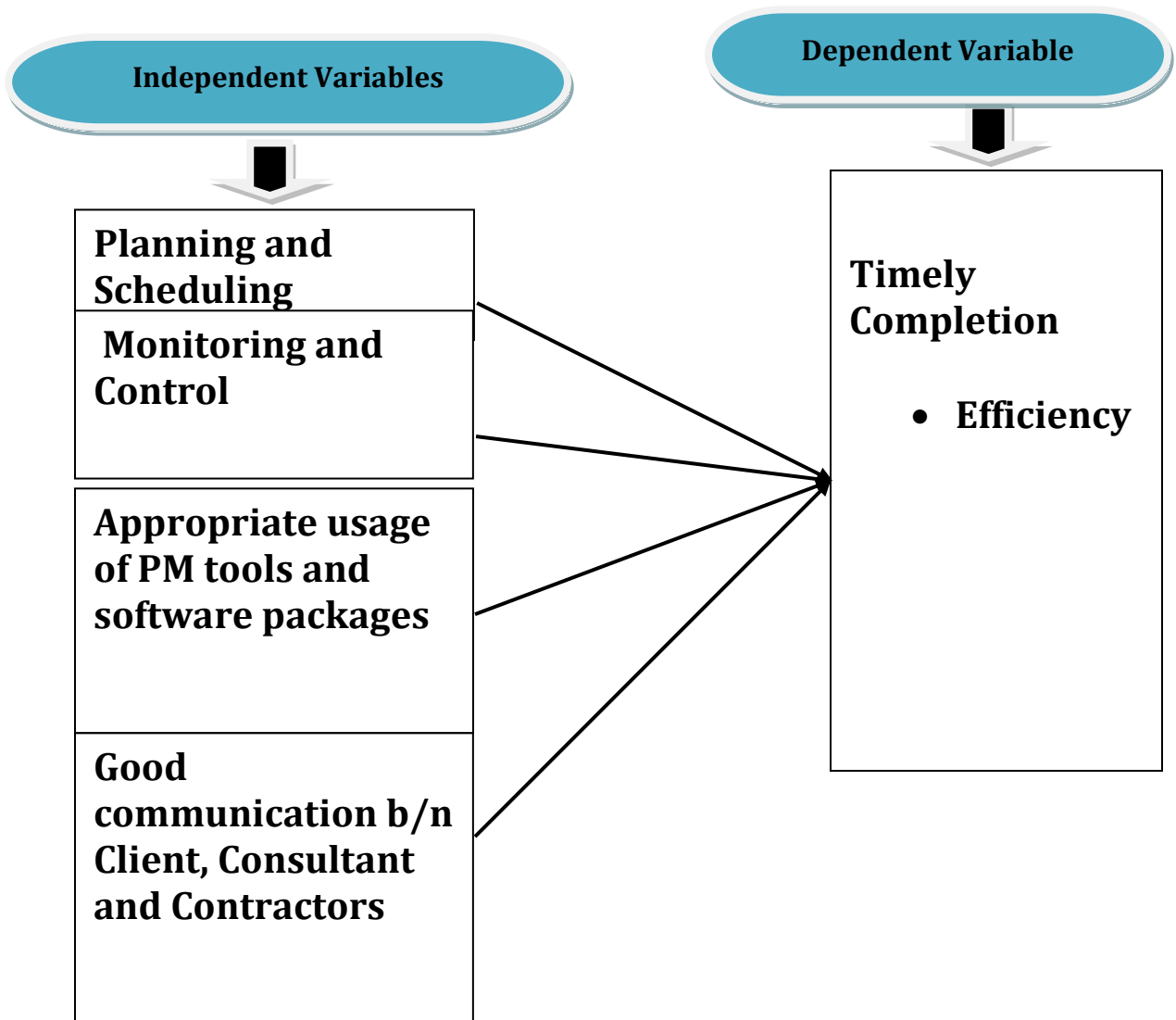


Figure 2.1: Conceptual framework

2.4 Literature Gap

Since this research targets on investigating the factors affecting the timely completion of projects in the 40/60 housing project of the Ayat condominium site by considering the issues related with managerial issues by scrutinizing the project management system of client, consultant and contractors. Thus, this is the new approach in dealing with the factors that affect timely completion it would contribute for the main project participants in dealing with the problems related with project delay from the project management view.

CHAPTER THREE

RESEARCH METHEDODOLOGY

3.1 Research Approach and Design

This research involves both qualitative and quantitative approaches for data collection and analysis. To gather quantitative data, survey questionnaires were administered to contractors, client, and consultant.

For qualitative approach, data will be collected from different sources such as documents, reports and books academic journals.

Based on the quantitative approach the analysis enables us to determine to what extent there is a relationship between two or more variables. In other words, how the factors contribute for the timely completion of the project. In addition, a representative sample of the wider population/group will be used. The research intended to make inferences from the larger groups by taking sampling.

The type of research employed under this study was explanatory research design, which explained the causal relationship between independent and dependent variables.

3.2 Variables, Data Source and Data Collection Methods

The researcher tried to investigate the factors that contribute for timely completion of the 40/60 housing project. By examining the relationship between dependent variable, ‘timely completion’ and independent variables such as proper planning and scheduling, effective project monitoring and control, application of appropriate PM tools and software packages, good communication or between client, consultant and contractor.

The researcher used both primary and secondary data to obtain quantitative and qualitative data. The primary data was collected through questionnaires. To encourage meaningful participation of respondents the questionnaire was kept simple and precise. The questionnaire was prepared in English language. A letter of assurance was provided for the respondents to maintain confidentiality of the information as an attachment to the questionnaire.

Various print and electronic contents like journals, variety of books, published and/or unpublished government documents, reports, newsletters, and websites were reviewed to develop the study.

The data collection method used in this research was structured and well organized questionnaire is particularly used for quantitative data. The research instrument that was used to collect primary data was a 5 point Likert Scale questionnaire which aimed to assess the essential data from respondents.

The questionnaire, developed in English. The first part contained background information about the respondent. The second part was comprised of 18 statements, so as to measure the variables of the study using a five-point Likert Scale being '1=Strongly Disagree', '2=Disagree', '3=Weakly Agree', '4=Agree' and '5=Strongly agree'. Thus, the respondents were requested to select their own choice among the given five dimensions in order to specify their level of agreement on each question item.

Regarding qualitative data document review is used. Review and analysis of important documents related to the study were reviewed in order to get sufficient data that supports the findings of the study.

3.3 Population and sampling Techniques

The population of the research consists of professional from the three parties (Contractors, Consultants and Client) currently on 40/60 saving houses project in the Ayat site. Hence, the population target area is Ayat site and the target populations are professionals who are employed in these three organizations namely the client, consultant and contractors.

Therefore, the sample was taken from the total contractor workers regarding the contractor side. Stratified random sampling was utilized to get information from the three major participants of the construction project namely client, contractor, consultant organizations.

This technique is preferred because it is used to assist in minimizing bias when dealing with the population. If a population from which a sample is to be drawn does not constitute a homogeneous group, stratified sampling technique is generally applied in order to obtain a representative sample (Kothari, 2004).

Disproportionate stratified sampling type was applied. According to disproportionate Stratified Sampling the number of sampling units drawn from each stratum is based on the analytical consideration, but not in proportion to the population size of that stratum.

The strata's are organizations including: construction organization (contractors), consulting organizations (consultants) and the client of the project. Although there are no general rules, the sample size usually depends on the population to be sampled. In this study to select sample size, a list of the population currently involved in the undergoing projects is used. The sample size is selected from construction organization (contractors), consulting organization, the client (AASHDE) as representative and also large enough for precision, confidence and generalizability of the research findings.

Based on Yemane (1996) sample size determination formula, it is possible to determine the sample size, at 93 % confidence level and 0.07 precision levels.

$$n = N / (1 + N(e)^2)$$

Where: n is number of respondents

N = population size = 172

e = sampling error/level of precision = 0.07

The total sample size of respondents based on the above sample size determination is 93.3.

Table 3.1 Number of Samples from each organization

Stratum	Total number of (Population)	No. of Sample
Contractors (professionals)	42	28
Consultants (professionals)	125	60
Client (professionals)	5	5
Total	172	93

3.4 Method of Data Analysis

After completed the data collection all completed research instruments were assembled, coded, summarized, entered into the computer; and analyzed using statistical package for Statistical Package for Social Science (SPSS). Both descriptive and inferential statistics were used for

analysis. Qualitative data was analyzed using content analysis.

For the quantitative data analysis includes inferential statistics that consists multiple regression analysis The study used multiple linear regression analysis to establish relationship between the independent variables and the dependent variable by use of the following regression formula:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 \dots + \epsilon$$

Where:

Y= Timely completion (Dependent Variable)

X₁- X₄=Independent Variables

X₁= Planning and scheduling

X₂= Monitoring and control

X₃=Application of appropriate PM Tools and software packages

X₄=Good Communication between client, consultant and contractor

β_0 = The constant

$\beta_1 - \beta_4$ = Coefficients

ϵ = Error Term

According to Sarstedt and Mooi (2014), regression analysis can provide insights that few other techniques can. The key benefits of using regression analysis are that it can:

1. Indicate if independent variables have a significant relationship with a dependent variable
2. Indicate the relative strength of different independent variables' effects on a dependent variable
3. Make predictions

3.4.1 Validity and Reliability

Validity

Validity is concerned with whether the findings are really about what they appear to be about (Sounders et. al., 2003). Validity defined as the extent to which data collection method or methods accurately measure what they were intended to measure (Sounders et. al., 2003). Numbers of different steps are taken to ensure the validity of the study:

- Data is collected from the reliable sources, from respondents who had experience in housing construction.
- Survey question are made based on literature review and frame of reference to ensure result validity.

Reliability

The reliability of the data can be referred to the consistency or dependability of a measure over time, over questionnaire items, or over observers/raters (Allen and Bennett, 2010). The Cronbach α coefficient is a measure of the inner consistency. The reliability test depicts the consistency degree of the data collected. The data collected (total respondents and contributing factors) in this study was analyzed with SPSS version 20 to calculate the value of Cronbach's alpha of the survey results.

Some past studies carried out by Memon et al. (2010), Enshassi et al. (2009) and Abdullah et al. (2010) also chose to use the Cronbach α to calculate the accuracy of the data obtained. Cronbach α value can be calculated as:

$$\text{Cronbach } \alpha = \left(\frac{k}{(k-1)} \right) \times \left[1 - \frac{\sum (s_i^2)}{s_{\text{sum}}^2} \right]$$

where s_i^2 is the Variance for the current sample of respondents; k is the total number of contributing factors and s_{sum}^2 is the variance for the sum of all respondents. Ideally, Cronbach's α should be greater than 0.9, but anything above 0.7 is considered acceptable for most research purposes (Allen and Bennett, 2010).

Table 3.2 Cronbach Alpha Coefficient for all variable

Cronbach'sAlpha^a	Cronbach's Alpha Based on Standardized Items	N of Items
.757	.761	5

Source: Own Survey, computed in SPSS, 2019

Table 3.3 Cronbach Alpha Coefficient for each variable

	No. of Items	Cronbach's Alpha (Total sample)
Project planning and scheduling	86	.735
Project monitoring and control	86	.717
Usage of PM tools and softwarePackages	86	.775
Good communication between client, consultant and contractor	86	.754
Timely Completion	86	.863

Source: Own Survey, computed in SPSS, 2019

Alpha coefficient ranges in value from 0 to 1. The higher the score, the more internally reliable the generated scale is. Cronbach's coefficient alpha value over 0.7 is believed to be acceptable reliability coefficient (Pallant, 2005).

The above table illustrates that the values of Cronbach's alpha for each of the questionnaire and the entire questionnaire. The values of Cronbach's alpha for each variable ranged between 0.717 and 0.775 with overall Cronbach's alpha value of 0.863 which is highly acceptable. In addition to this the overall reliability statistics for five variable items is 0.761. Hence, based on the above reliability statistics, it is above the minimum required threshold and showed that the high reliability of the questionnaire.

3.5 Ethical Consideration

The researcher assures the ethical undertaking of the research by adhering to the following ethical standards of doing research. Informed consent, voluntary participation, confidentiality and anonymity of respondents. During data collection, each respondent was informed about the purpose, scope and expected outcome of the research, and appropriate written consents was taken from the respondents. Anyone who was not willing to participate was excluded from the study.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION

This chapter deals with the results and analysis of the findings and it contains three sections. The first section presented descriptive and correlation analysis on variables of the study; the second section presented fulfillment of the assumptions; the third section laid down the results of regression that constitute the main findings of this study.

The primary focus of the study was on factors affecting timely completion of the 40/60 housing project at Ayat condominium site. Therefore, this chapter presents the analysis of responses that were received via questionnaires distributed to professionals of the three main project participant namely client, consultant and contractors.

Hence, in this chapter, the data collected from respondents were analyzed and interpreted using quantitative analysis which involves analysis of the background information of respondents and the descriptive as well as inferential statistics employed to test the hypothesis and to investigate the influence of independent variables on the dependent variable.

A total of 93 questionnaires were personally handed to the respondents with close follow up and guidance in filling the questionnaires. Out of the total respondents, 86 respondents completed the questionnaires in suitable form.

Contractual Parties	Questionnaire Distributed	Questionnaire Responded	Response Rate
Client	5	5	100%
Consultant	60	56	93.33%
Contractor	28	25	89.28%
Total	93	86	92.47%

Table 4.1 Questionnaire Response Rate

4.1 Descriptive statistics

4.1.1 Background Information about the respondent

The questionnaire included a segment on respondent's background information as factors which likely to influence timely completion of the 40/60 housing project at Ayat Site. The background information about the respondents is described below in the following table.

Table 4.2: Background Information about professionals from client, consultant and contractors selected from 40/60 housing project of Ayat Site

No.	Background Information		Frequency	Percentage
1	Sex (Gender)	Male	56	65.1
		Female	30	34.9
		Total	86	100.0
2	Age	21-30	42	48.8
		31-40	32	37.2
		41-50	11	12.8
		Above 50	1	1.2
		Total	86	100.0
3	Education level	Secondary Edu.	0	0
		Vocational Training	0	0
		Diploma	3	3.5
		BA Degree	68	79.1
		Master degree	15	17.4
		Above Master degree	0	0
		Total	86	100.0
4	Work Experience	Less than 3 years	5	5.8
		3-5 Years	18	20.9
		5-10 Years	38	44.2
		10-15 Years	21	24.4
		More than 15 years	4	4.7
		Total	86	100.0
5	Employment type of respondent	Client/Employer	5	5.8
		Consultant	56	65.1
		Contractor	25	29.1
		Total	86	100.0

Source: Own Survey, computed in SPSS, 2019

As shown from the above table the respondents were mostly in the age group of 21-30 and 31-40 years which covers 86% of the total respondents. The gender distribution which covers 65.1% for male and 34.9% for female and the respondents were predominantly degree and masters holders which cover 79.1% and 17.4 % respectively. Moreover, 3.5% of the respondents are diploma holders.

Coming to the work experience of the respondents the highest range was from 5-10 years, which cover 44.2% of the total. The 24.4% of the respondents had found in the experience ranges from 10-15 years followed by 20.9% of the respondents had found in the work experience ranges from 3-5 years. Beside these, respondents worked more than 15 years cover 4.7% and below 3 years of work experience cover 5.8%.

In order to support the understanding that those respondent's information could play a role on the project timely completion of the Ayat 40/60 housing project, the following explanation about each entity under the respondents information give a justification for the claim.

Regarding the gender distribution, participation of females in the project was not satisfactory. The fact that increasing the number of professional women contributes for project efficiency or project timely completion. It is scientific that enhancing the professional women participation in any project could increase work efficiency. So, an increased professional women involvement in the specified project can increase efficiency or timely completion. Therefore, the gender distribution has an impact on the timely completion of the 40/60 housing project. So, in this regard the involvement of professional women in the 40/60 project at Ayat site is not satisfactory.

Age also plays an important role in the implementation of projects with the objective to complete a project on specified time. It directly relate with individual's capacity work efficiency.

Age plays a critical role in understanding how people of different ages view the implementation of projects, to a larger extent an older employee is more experienced and is likely to relate issues more directly than relatively younger employees, while the younger employees are perceived to be more receptive to new technologies in the work place. It was also meant to determine whether the respondents were young, mature or old (Murithi, et al.,2017).

Based on the above data most of the professionals involved in the 40/60 housing project of Ayat site are relatively young. Despite the young work force is the productive force and receptive to new technology the age level by itself limit the young professionals to deal problems in a matured way due to lack of accumulated skills acquired through practical application of knowledge that could be developed through experience. Therefore, from this angle age can be a factor, which hinder the timely completion of the 40/60 project. Hence, unless the balance should be kept in the age distribution there will be a problem of project delay.

The level of education is important in the implementation of the project as it known the level of theoretical concepts exposure for the respondents that may influence their job execution efficiency. Based on the above data the majority of professionals from all the three sides namely client, consultant and contractors at Ayat 40/60 project are first degree holders. Therefore. The involvement of highly qualified professionals has a positive influence on individual work efficiency. As a result of this timely completion of the project would be enhanced.

Respondents with longer period of service are more experienced and are in a position to explain processes and activities involved in project implementation. They have adequate and enough working experience and are in a better position to understand the organizations activities well. (Murithi, et al.,2017)

Hence, based on the above data the maximum professionals' work experience range was from 5-10 which can be considered as satisfactory but not the optimum. So, incorporating highly experienced professionals in the 40/60 housing project could increase the rate of the project completion time.

The other one included in the respondent background information was employment type of the professionals who involved in the 40/60 housing project. It is important also for the professionals of the three organizations (client, consultant and contractors) to be able to understand the required responsibility, capacity or role in ensuring timely completion of a project.

4.1.2 Mean and Standard deviations of factors affecting the timely completion of 40/60 housing project

Descriptive statistics (mean and standard deviations) of the respondents' scores were computed and analysis has been done by comparing these mean scores and standard deviations among respondents. The reason for using descriptive statistics is to compare the different factors that affect timely completion of the 40/60 housing project in the case of Ayat condominium at Addis Ababa by using the means and standard deviations values.

Table 4. 3. Mean and Standard deviations

Variables	N	Mean	Std. Deviation
Timely completion	86	1.1628	0.37134
Project planning and scheduling	86	2.5785	0.57171
Project monitoring and control	86	3.0145	0.62350
Appropriate usage of PM tools and software packages	86	2.5070	0.57452
Good communication between client, consultant and contractors	86	2.8488	0.59443

Own Survey, computed in SPSS, 2019

The standard deviation 0.371 indicates that there was moderate variability in timely completion in the data. The table also suggests that all timely completion factors rated as above satisfactory. As far as the mean values are concerned, out of the factors project planning and scheduling (mean of 2.57), project monitoring and control (mean of 3.01), appropriate usage of PM tools and software packages (mean of 2.50) and good communication between client, consultant and contractors (mean of 2.84) have relatively major roles on timely completion. As the above table depicted, all explanatory variables play a fundamental role for timely completion at Ayat 40/60 project site.

4.2 Correlation Analysis of factors affecting the timely completion of 40/60 housing project

Pearson correlation test was conducted to know the degree of relationship between the independent variables i.e. project planning and scheduling, project monitoring and control,

appropriate usage of PM tools and software packages, communication orbetween client, consultant and contractors and dependent variable i.e. timely completion. Based on the questionnaires, which were filled by the professionals selected at Ayat 40/60 housing project. The results of the correlation analysis between these variables are shown in table below.

Table 4.4 Correlation Analysis

		Timely completion	Project planning & Scheduling	Project monitoring & control	Appropriate usage of PM tools/techniques and Software Package	Good communication
Timely completion	Pearson Correlation	1.000				
	Sig. (1-tailed)					
	N	86				
Project planning & Scheduling	Pearson Correlation	.650	1.000			
	Sig. (1-tailed)	.000	.000			
	N	86	86			
Project monitoring & control	Pearson Correlation	.707	.325	1.000		
	Sig. (1-tailed)	.000	.000	.000		
	N	86	86	86		
Appropriate usage of PM tools & software Pac	Pearson Correlation	.813	.289	.303	1.000	
	Sig. (1-tailed)	.000	.000	.000	.000	
	N	86	86	86	86	
Good communication	Pearson Correlation	.846	.232	.310	.313	1.000
	Sig. (1-tailed)	.000	.000	.000	.000	
	N	86	86	86	86	86

Source: Own Survey, computed in SPSS, 2019

As the results shown in Table 4.4, the independent variables (project planning and scheduling, project monitoring and control, appropriate usage of PM tools and software packages and good communication between and communication positively correlated with the dependent variable: (project planning and scheduling influence (Pearson Correlation = 0.650, $p < .001$), project monitoring and control's influence (Pearson Correlation = 0.707, $p < .001$), appropriate usage of

PM tools and software packages (Pearson Correlation = 0.813, $p < .001$), and good communication between client, consultant and contractors (Pearson Correlation = 0.846, $p < .001$).

The results of correlation analysis shows positively and significantly correlated with the dependent variable i.e. timely completion at 99 percent confidence level ($P < 0.01$).

The finding on table 4.4 above further indicates that the highest significant relationship is found between good communication between client, consultant and contractors and timely completion (Pearson Correlation = .846, $p < 0.01$), however the lowest statistically significant relationship is found between planning and scheduling influence and timely completion (Pearson Correlation = .650, $P < 0.01$).

4.3 Inferential Analysis of factors affecting the timely completion of 40/60 housing project

Like the descriptive statistical methods, i.e. background information about respondents, the scale typed questionnaire has been entered to the SPSS software version 20 and inferential statistics methods such as: simple correlation and multiple regression methods has been employed to test the hypothesis.

4.3.1 ANOVA Test

Table 4.5 ANOVA

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	52.084	4	13.021	45.977	.000 ^b
	Residual	22.940	81	.283		
	Total	75.023	85			

Source: Own Survey, computed in SPSS, 2019

The significant level in ANOVA table shows that the combination of variables significantly predicts the dependent variable. ANOVA that tests whether the model is significantly better at predicting the outcome than using the mean as a best guess; specifically, the F-ratio represents

the ratio of the improvements in prediction that results from fitting the model, relative to the inaccuracy that still exists in the model.

For these data, F is 45.977, which is significant at $p < 0.001$. This result tells us there is less than 0.1% chance that an F-ratio is larger would happen by chance alone. Therefore, it can be said that the regression model results in significantly better prediction of timely completion.

4.3.2. Multiple Regressions Analysis

Regression model was applied to test how the factors affect timely completion of the 40/60 housing project. Coefficient of determination R^2 is the measure of proportion of the variance of dependent variables about its mean that is explained by the independent or predictor variables. It is conducted to examine the effect of independent variable on the dependent variable and identify the relative significant influence; i.e. Independent variable (planning and scheduling, monitoring and control, appropriate usage of PM tools and software packages and communication to the dependent variable; i.e. timely completion of the 40/60 housing project in the case of Ayat Condominium. Higher value of R^2 represents greater explanatory power of the regression equation. The proposed hypotheses were tested using multiple regression analysis. The results of the regression analysis are depicted in the following table.

Table 4.6 Regression coefficient analysis of the model

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.952	.385		5.069	.000
Project planning and scheduling	.082	.120	.050	.684	.046
Project monitoring and control	.209	.113	.139	1.858	.007
Appropriate usage of PM tools/techniques and software packages	.086	.110	.737	10.980	.000
Good communication or between client, consultant and contractors	.095	.105	.060	.905	.038

Source: Own Survey, computed in SPSS, 2019

H₁: Project planning and scheduling affect the timely completion of the housing project.

The result of multiple regression analysis of the above table clearly indicates that the planning and scheduling influence has significant influence on timely completion ($p < 0.05$). Besides, the value of beta in planning and scheduling ($\beta = 0.05$) shows the positive effect of on timely completion. This implies that a one unit increases in planning and scheduling results in 0.05 unit increase in timely completion housing project. Thus, the above proposed hypothesis is accepted.

H₂: Project monitoring and control affect the timely completion of the housing project.

The result of multiple regression analysis of the above table clearly indicates that in monitoring and control's influence has significant influence on timely completion ($p < 0.01$). Besides, the value of beta in monitoring and control's influence ($\beta = 0.139$) shows the positive effect of on timely completion. This implies that a one unit increases in monitoring and control's influence, 0.139 unit increase in timely completion of the housing project. Thus, the above proposed hypothesis is accepted.

H₃: Appropriate usage of PM tools and software packages affect the timely completion of housing project.

The result of multiple regression analysis of the above table clearly indicates that in appropriate usage of PM Tools/Techniques and Software Packages has significant influence on timely completion ($p < 0.01$). Besides, the value of beta in appropriate usage of PM tools ($\beta = 0.737$) shows the positive effect of on timely completion. This implies that a one unit increases in appropriate usage of PM Tools, 0.737 unit increase in timely completion housing project at Ayat site. Thus, the above proposed hypothesis is accepted.

H₄: Good communication between client, consultant and contractors affect timely completion of housing project.

The result of multiple regression analysis of the above table clearly indicates that in communication between client, consultant and contractors has significant influence on timely completion ($p < 0.05$). Besides, the value of beta in communication between client, consultant and contractors ($\beta = 0.060$) shows the positive effect of on timely completion. This implies that a one unit increases in communication between client, consultant and contractors, 0.060 unit increase in timely completion on 40/60 housing project of Ayat site. Thus, the above proposed hypothesis is accepted.

Table 4.7 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.833 ^a	.694	.679	.53217	.694	45.977	4	81	.000	1.710

Source: Own Survey, computed in SPSS, 2019

Overall, the given table revealed that all independent variables accounted for about 69.4% of the contribution for timely completion (adjusted $R^2 = 0.679$). Thus, 67.9% of the variation in timely completion can be explained by four factors.

From the above finding the study can develop the following regression model

$$TC = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

$$TC = 1.952 + 0.50X_1 + 0.139X_2 + 0.737X_3 + 0.060X_4 + \varepsilon$$

Where,

TC= Timely Completion

α =Constant

β =Coefficient of estimate

X_1 = Project planning and scheduling

X_2 = Project monitoring and control

X_3 = Appropriate usage of PM tools and software packages

X_4 = Good communication

ε = the error term

4.4. Finding

Planning and scheduling

According to the regression result of planning and scheduling has a positive relationship with timely completion of the 40/60 housing project at Ayat site by a coefficient estimate of 0.50. This means that holding other independent variables constant and when one percent increases in planning and scheduling, consequently it improves timely completion by 50.0% and the p value of planning and scheduling is 0.046 reveals that it is statistically significant at 5% level of significance. Accordingly, the result supports the working hypothesis that planning and scheduling has positive influence and statistically significant effect on timely completion.

Monitoring and control

According to the regression result of project monitoring and control influence has a positive relationship with timely completion of the 40/60 housing project at Ayat site by a coefficient estimate of 0.139. This means that holding other independent variables constant and when one percent increases in monitoring and control, consequently it improves timely completion by 13.9% and the p value of monitoring and control influence is 0.007 reveals that it is statistically significant at 1% level of significance. Accordingly, the result supports the working hypothesis that monitoring and controlling's influence has positive and statistically significant effect on timely completion.

Appropriate usage of PM tools and software packages

According to the regression result of appropriate usage of PM tools and software packages has a positive relationship with timely completion of the 40/60 housing project at Ayat site by a coefficient estimate of 0.737. This means that holding other independent variables constant and when one percent increases in appropriate usage of PM tools and software packages, consequently it improves timely completion by 73.7% and the p value of usage of PM tools and software package is 0.000 reveals that it is statistically significant at 1% level of significance. Accordingly, the result supports the working hypothesis that appropriate usage of PM tools and software packages has positive and statistically significant effect on timely completion.

Good communication between client, consultant and contractors

According to the regression result of communication between client, consultant and contractor has a positive relationship with timely completion of the 40/60 housing project at Ayat site by a coefficient estimate of 0.060. This means that holding other independent variables constant and when one percent increases in communication between client, consultant and contractors, consequently it improves timely completion by 6% and the p value of communication or among the three parties is 0.038 reveals that it is statistically significant at 5% level of significance. Accordingly, the result supports the working hypothesis that communication or between client, consultant and contractors has positive and statistically significant effect on timely completion.

Generally the overall result is depicted in the following table.

Table 4.8 Summary of the overall outcome of the research hypotheses

<i>Hypothesis</i>	<i>Result</i>	<i>Reason</i>
H₁: Project planning and scheduling has a positive influence and statistically significant effect on timely completion.	Accepted	$\beta=0.50,$ $p<0.05$
H₂: Project monitoring and control has positive influence and statistically significant impact on timely completion.	Accepted	$\beta=0.139,$ $p<0.01$
H₃: Appropriate usage of PM tools and software Packages has positive influence and statistically significant effect on timely completion.	Accepted	$\beta=0.737,$ $p<0.01$
H₄: Good communication between client, consultant and contractors has positive influence and statistically significant effect on timely completion.	Accepted	$\beta=0.060,$ $p<0.05$

Source: Own Survey, computed in SPSS, 2019

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

This chapter presents summary, conclusion and recommendations based on the findings of the study. Accordingly, this chapter is organized into three subsections.

5.1 Summary of findings

The research general objective was to examine factors affecting timely completion of the 40/60 housing project in the case of Ayat condominium site Addis Ababa. The study considered ninety three samples and distributed questionnaires for professionals who work for the three project participant organizations namely client, consultant and contractors of the 40/60 Ayat site. Out of these the 93 distributed questionnaire only 86 respondents were properly filed and respond for the study. In line with this, it carried out by constructing a regression model using SPSS through testing relevant assumptions. The overall result obtained from the regression model indicates that project planning and scheduling, project monitoring and control, appropriate usage of PM tools and software packages and communication have positive and significant impact on timely completion. The dependent variable is timely completion and independent variables are project planning and scheduling, project monitoring and control, appropriate usage of PM tools and software packages and communication in order to attain the objective of the study.

5.2 Conclusions

The study specifically examines factors affecting timely completion of the 40/60 housing project the case of Ayat condominium site Addis Ababa.

- The result indicates positive and significant association between project planning and scheduling influence and timely completion which implies that an effective planning and scheduling inevitably lead to enhance timely completion.
- Project monitoring and control's influence has also positive and significant association with timely completion. This implies that an effective in monitoring and control's influence, definitely lead to enhance the timely completion.
- Appropriate usage of PM tools and software package has positive and significant effect on timely completion. This implies that application of PM tools has significant contribution on timely completion.
- The result indicates positive and significant association between good communication between client, consultant and contractors and timely completion, which implies that close and smooth communication between the three parties, enhance timely completion definitely lead to enhance timely completion.

In general, planning and scheduling, monitoring and control, application of PM tools and software packages and good communication between client, consultant and contractors have positive and significant association with timely completion.

5.3 Recommendation

The findings of the study showed that planning and scheduling, monitoring and control, appropriate usage of PM tools and software packages, good communication between client, consultant and contractors are significant factors for timely completion. Hence, focusing and taking the necessary action on these variables could improve the probability containing the effect on timely completion. Based on the findings from the researcher has drawn the following recommendations.

- Planning and scheduling have positive and significant effect on timely completion; so that the three project main actors should give serious concern for planning and scheduling of the project in the pre-construction phase and in the process of construction by collaborative effort. It is therefore important to plan and schedule every thing that should be done carefully and professionally.
- The analysis indicated that project monitoring and control have positive and significant influence on timely completion. Hence, it is important to ensure that project monitoring and control should be streamlined in accordance with the needs of the projects to achieve timely completion.
- The finding explained that appropriate usage of PM tools and software packages has positive and significant effect on timely completion. Consequently, identifying the required PM tools/techniques and software package should be the first task and ensuring the availability of skilled professionals for capably using the technologies.
- The result disclosed that good communication between client, consultant and consultant has positive and significant effect on timely completion. The actors must wish to communicate more for the purpose of receiving information about decision and should increase the use of modern communication methods including electronic mail and other IT-tools. More specifically, the actors should maintain project synergy in order to achieve the common goal or complete the project on agreed time. It is recommended also that the parties have to identify the type of relationship and flow of communication.

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APPENDIX

Questionnaire

Dear participant,

I am currently working on a research study on **Factors affecting the Timely Completion of the 40/60 Project: the case of Ayat Condominium site** in fulfillment of the Requirement for the Degree of Master of Business Administration (MBA) in General Management at St. Mary's University.

To successfully undertake this research it is mandatory to get the response of contractors, clients and consultants currently working on the scheme project and hence you are one of the stakeholders recruited to complete this questionnaire. Hence, I kindly request you to complete the accompanying questionnaire.

I would like to confirm you that your response will be kept confidential and it will be used for academic purposes only.

With Regards, Biniyam Haile

Advisor: Maru Shete (PhD & Assoc.Prof.)

Thank you very much for your cooperation!

PART ONE: Background information about the respondent

- 1.1 Sex of the respondent: 1= Male 2=Female
- 1.2. What is your age? -----years
- 1.3. Level of Education:
1=Secondary 2=Vocational Training 3= Diploma 4=Degree 5= Masters 6=PhD
- 1.4. What is your work experience in building construction related projects?--years.
- 1.5. In what capacity you are working in the 40/60 housing project?
1=Client/Employer 2= Consultant 3=Contractor

PART TWO: Factors Contributing for Timely Completion of Project

2. Influence of Project planning and scheduling on Timely Project Completion

Below are numbers of factors affecting the timely completion of housing projects. From your experience on the project, please express your opinion on the role of the following factors as contributing factors for timely completion of Addis Ababa 40/60 housing construction project at Ayat Site.

2.1. Items on Project planning and scheduling

Indicate your position on the factors below appropriately: 1= Strongly Disagree 2= Disagree 3= Weakly Agree 4= Agree 5= Strongly Agree

Factor	1	2	3	4	5
2.1.1 There is proper planning and scheduling of 40/60 housing construction project at Ayat Site					
2.1.2 There is proper cost estimation in 40/60 housing construction project at Ayat Site					
2.1.3 Sequence of activities to be executed in this project was identified properly					
2.1.4 Project design was done appropriately in 40/60 housing construction project at Ayat Site					

3. The influence of Project Monitoring and Control

3.1 Items on Project Monitoring and Control

Indicate the degree to which you agree or disagree with the following statements: 1= Strongly Disagree 2= Disagree 3= Weakly Agree 4= Agree 5= Strongly Agree.

Factor	1	2	3	4	5
3.1.1 Project monitoring and control in this project is carried out properly					
3.1.2 Timely decision is made by supervisors using monitoring information					
3.1.3 Appropriate corrective action was made when Project deviance occurred.					
3.1.4 Reporting of up-to-date project status and close project follow up is done					

4. The contribution of practicing appropriate Project Management tools and software package

4.1 Items on Project Management tools and software package

Indicate the degree to which you agree or disagree with the following statements: 1= Strongly Disagree 2= Disagree 3= Weakly Agree 4= Agree 5= Strongly Agree.

Factor	1	2	3	4	5
4.1.1 Time planning and control technique applied for the project is appropriate					
4.1.2 Project time control software is applied in 40/60 housing construction project at Ayat Site					
4.1.3 The project fully utilized the relevant tools and software in the whole project phases.					
4.1.4 The project had no gap in incorporating skilled professionals for using software packages.					
4.1.5 The whole project cycle (phase) supported by					

5. The impact of communication b/n Client, Consultant and Contractors

5.1 Items on communication b/n Client, Consultant and Contractors

Indicate the degree to which you agree or disagree with the following statements: 1= Strongly Disagree 2= Disagree 3= Weakly Agree 4= Agree 5= Strongly Agree.

Factor	1	2	3	4	5
5.1.1 There is effective communication between client, consultant and contractor in 40/60 housing construction project at Ayat Site					
5.1.2 Relationship among stakeholders is properly managed in 40/60 housing construction project at Ayat Site					
5.1.3 The project adopted appropriate systems for effective Communication					
5.1.4 There is appropriate information distribution and project status reporting system in 40/60 housing construction project at Ayat Site					

Assessment of overall timely completion of 40/60 housing construction project at Ayat Site

6. How do you rate the timely completion of 40/60 housing construction project at Ayat Site

1= Very much delayed 2= Significantly delayed 3= Moderately delayed 4= Completed on time 5= Completed before schedule

Assumptions Testing in Multiple Regressions factors affecting timely completion of 40/60 housing project

The basic assumption should be satisfied in order to maintain data validity and robustness of the regressed result of the research under the multiple regression models. Hence, this study has conducted the assumption tests such as, multi-collinearity, linearity, homoscedasticity and normality.

Multi Collinearity of Independent variables

Multi Collinearity is checked using correlations between the variables in the model. Independent variables show at least some relationship with dependent variable. In this case the scales planning and scheduling, monitoring and control, appropriate usage of PM tools and communication between client, consultant and contractors with timely completion correlate substantially (0.704, 0.675, 0.837, and 0.849) respectively. As it can be seen from the table these requirements are validated and there is no issue of Multi Collinearity.

Collinearity diagnostics on the variables as part of the multiple regression procedure is done using tolerance and variance inflation factor (VIF). Tolerance is an indicator of how much of the variability of the specified independent is not explained by the other independent variables in the model. If this value is very small (less than 0.10), it indicates that the multiple correlation with other variables is high, suggesting the possibility of multi Collinearity (Pallant, 2010) furthermore, the other value given is the VIF, which is just the inverse of the tolerance value (1 divided by tolerance). According to Pallant (2010), VIF values above 10 would be a concern, indicating multi Collinearity.

Table I: Collinearity Diagnosis

Model	Collinearity Statistics	
	Tolerance	VIF
(Constant)		
Project planning and Scheduling	.704	1.420
Project monitoring and control	.675	1.481
Appropriate usage of PM tools and software packages	.837	1.194
Good communication between client, consultant and contractors	.849	1.178

Source: Own Survey, computed in SPSS, 2019

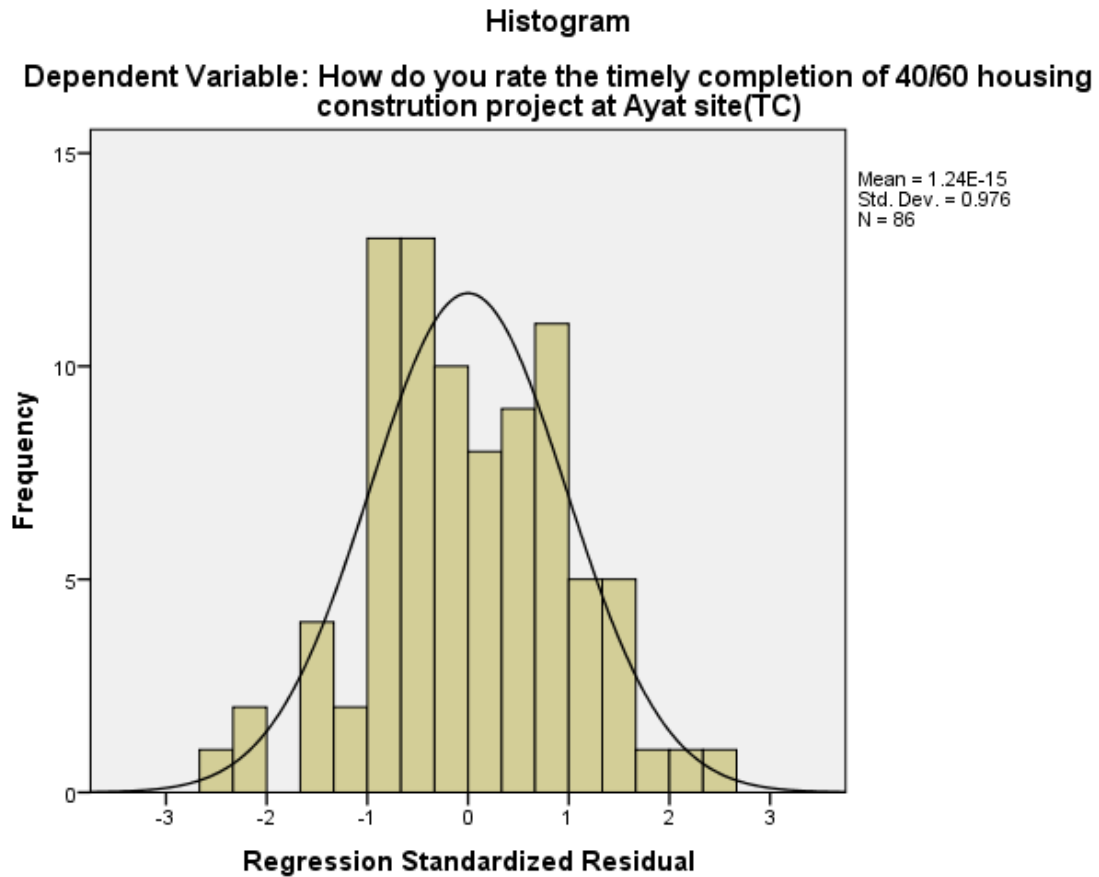
The result shows that the tolerance value for each independent variable is (0.704, 0.675, 0.837, and 0.849) respectively, which are not less than 0.10; therefore, multi Collinearity assumption is not violated. This is also supported by the VIF value, which is 1.420, 1.481, 1.194 and 1.178 which is well below the cut-off 10 as shown in the coefficient table.

Normality, linearity of residuals: one of the ways that these assumptions can be checked is by inspecting the residuals scatter plot and the normal probability plots of the regression standardized residuals that were requested as part of the analysis. These are presented in normal P-P Plots of regression standardized residuals graph. In normal probability plots the points will lie in reasonably straight diagonal line from bottom left to top right. This would suggest no major deviations from normality. The finding from normal P-Plot reveals no violation of normality assumptions.

Test of Normality

The study used both methods of assessing normality; graphically using Normal Probability Plot(P-P) graph and using Skewness and Kurtosis numerically.

Figure I: Frequency Distribution of Standardized Residual



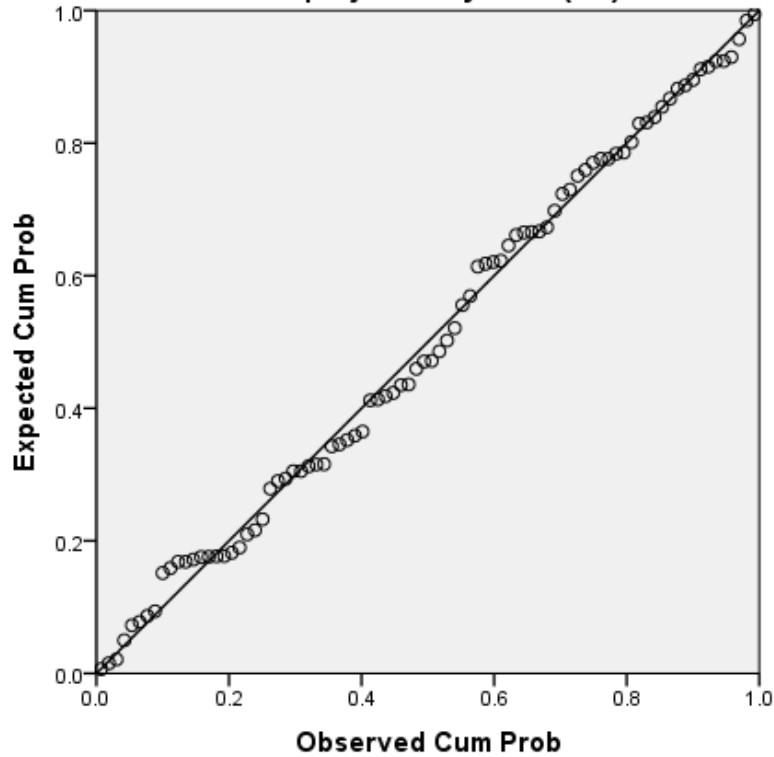
Source: Own Survey, computed in SPSS, 2019

Test of linearity

In the Normal Probability Plot it will be hoped that points will lie in a reasonably straight diagonal line from bottom left to top right. This would suggest no major deviations from normality. The study applied Normal P-P Plot of regression Standardized Residual (See Figure I) to test linearity. Since the points were symmetrically distributed around a diagonal line, linearity pattern was observed. Hence, the straight-line relationship between the residuals and the predicted dependent variable scores depicted that linearity was achieved.

Figure II: Normal Point Plot of Standardized Residual

Normal P-P Plot of Regression Standardized Residual
Dependent Variable: How do you rate the timely completion of 40/60 housing construction project at Ayat site(TC)



Source: Own Survey, computed in SPSS, 2019

Kurtosis and Skewness

As Field (2009) and Garson (2012) noted, many statistical procedures assumed that the sampling distribution is normally distributed and so, if the sample data are approximately normal then the sampling distribution will be also. In this regard, it is useful to test for normality of the sample data. Therefore, it was checked for the data to see if they are normally distributed through quantify aspects of a distribution (i.e. skewness and kurtosis) and presented as follows.

Table II: Kurtosis and Skewness

	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
Project planning and scheduling	86	-.252	.260	.425	.514
Project monitoring and control	86	-.678	.260	.451	.514
Appropriate usage of PM tools and software packages	86	-.203	.260	.233	.514
Good communication	86	-.371	.260	.270	.514
Timely completion	86	.488	.260	-.559	.514

Source: Own Survey, computed in SPSS, 2019

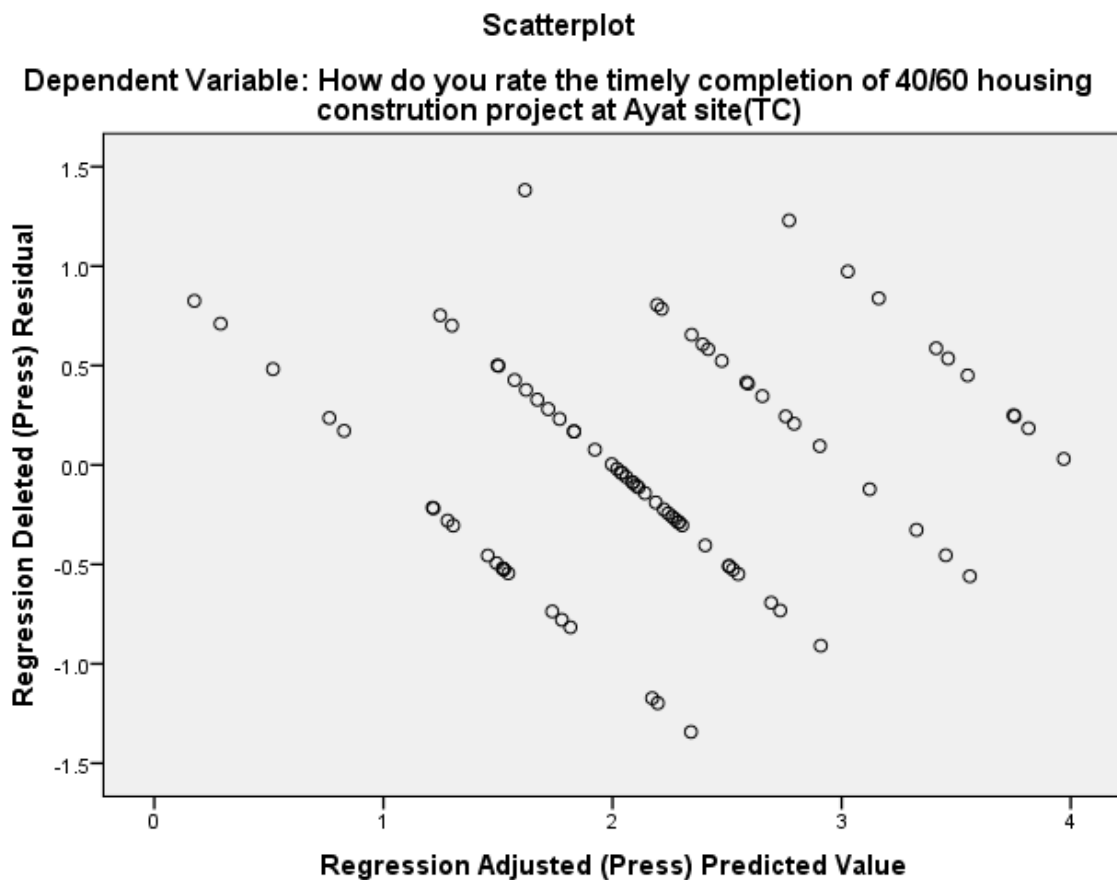
According to Garson (2012), as a rule of thumb, for normality skew should be within the +2 to -2 range, when the data are normally distributed. Some statisticians also prescribe +1 to -1 as a more stringent criterion when normality is critical. In this regard, as shown in the above table, the skew value is perfectly fit within the limit and ranges between -.678 and 0.488. Thus, in this research, is said to be normally distributed.

Furthermore, as Garson (2012) suggests, kurtosis should be within the +2 to -2 range when the data are normally distributed, while some statisticians prescribe +1 to -1 as a more stringent criterion when normality is critical. Taking both options in to consideration, when we look at table 4.7, the kurtosis value is perfectly fit within the limit and ranges between 0.451 and -.559. Therefore, it can be explained that, abnormality of the data distribution cannot be a problem for this study.

Homoscedasticity

Homoscedasticity is the extent to which the data values for the dependent and independent variables have equal variances, as Saunders, et al. (2009) noted. Based on the explanation by Field (2009), at each level of the predictor variables, the variance of the residual terms should be Constant which means the residuals at each level of the predictors should have the same variance, therefore checking for this assumption is helpful for the goodness of the regression model. Field (2009) suggested that it should plot the standardized residuals, or errors (ZRESID) on the Y axis and the standardized predicted values of the dependent variable based on the model (ZPRED) on the X axis to get the homoscedasticity result.

Figure III: Scatter Plot of Standardized Residual



Source: Own Survey, computed in SPSS, 2019

According to Garson (2012), homoscedasticity help as to check for the relationship under investigation is the same for the entire range of the dependent variable and lack of homoscedasticity is shown by higher errors (residuals) for some portions of the range, which can be seen on the scatter plot.

In this regard, as Field (2009) describes, the graph of *ZRESID and *ZPRED should look like a random array of dots evenly dispersed around zero, if the assumption of homoscedasticity has to be met. Likewise, as shown in the above figure, the points are randomly and evenly dispersed throughout the plot and there are no obvious outliers on this cloud of dots which are spaced around zero. Therefore, it can be conclude that the assumptions of random errors and homoscedasticity have been met.