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ST. MARY'S UNIVERSITY

SCHOOL OF GRADUATE STUDIES

**ASSESSMENT OF PROJECT MANAGEMENT TOOLS
APPLICATION ON 40/60 ASKO CONDOMINIUM HOUSING
PROJECT**

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ADDIS ABABA, ETHIOPIA.

ST. MARY'S UNIVERSITY
SCHOOL OF GRADUATE STUDIES
DEPARTMENT – PROJECT MANAGEMENT

**ASSESSMENT OF PROJECT MANAGEMENT TOOLS APPLICATION
ON 40/60 ASKO HOUSING PROJECT**

BY

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*A THESIS SUBMITTED TO ST. MARY'S UNIVERSITY, SCHOOL OF
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REQUIREMENTS FOR THE DEGREE OF MASTERS OF PROJECT
MANAGEMENT.*

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DECLARATION

I, Meron Lemma, declare that this thesis is my original work, prepared under the guidance of Maru Shete Bekele (Ph.D. & Ass. Prof.). All sources of materials used in preparing these papers have been duly acknowledged.

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ENDORSEMENT

This thesis has been submitted to St. Mary's University, School of Graduate Studies for examination with my approval as a university advisor.

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Signature

2020

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Table of Contents

DECLARATION.....	iv
ENDORSEMENT.....	v
ACKNOWLEDGMENTS.....	vi
LIST OF TABLE.....	ix
ABBREVIATIONS AND ACRONYMS	x
ABSTRACT.....	xi
CHAPTER ONE: INTRODUCTION	1
1.1 Background of the study.....	1
1.2 Statement of the problem	4
1.3 The objective of the study	5
1.3.1 General objective.....	5
1.3.2 Specific objective	5
1.4 Research questions	6
1.5 Definition of basic terms	6
1.6 Scope of the study.....	7
1.7 limitation of the study.....	7
1.8 Significance of the study.....	7
1.9 Organization of the study	8
CHAPTER TWO: LITERATURE REVIEW	9
2.1 Definition and Concepts of project management and Project management tools and techniques Definition of Terms	9
2.1.1 Project.....	9
2.1.2 Project management.....	10
2.1.3 Construction project	12
2.1.4 Project success.....	12
2.2. Theoretical Literature	14
2.2.1Project management tools and techniques.....	14
2.2.2 Project Time management	14
2.1.5 Project scope management	18
2.1.6 Project management tools	19
2.2 Empirical Study.....	24

2.3 Summary	27
CHAPTER THREE: RESEARCH METHODOLOGY	28
3.1 Research design and research approach.....	28
3.2 Sample Size and Sampling Techniques	28
3.2.1 Research Population	28
3.2.2 Sampling Techniques	29
3.3 Data Sources	29
3.4 Data Gathering Instruments	29
3.4.1 Designing the Questionnaire.....	30
3.5 Method of Data Analysis.....	30
3.6 Validity and Reliability.....	30
3.7 Ethical consideration	31
CHAPTER FOUR DATA ANALYSIS, PRESENTATION, AND INTERPRETATION OF FINDINGS.....	32
4.1 Response rate and characteristics of respondents	32
4.2 Practices of using project time and cost management tools.	34
4.2.1 project time management tools.....	34
4.2.2 project cost management tools	36
4.3 Challenges to applying PMTT	39
CHAPTER FIVE CONCLUSION AND RECOMMENDATION	40
5.1 CONCLUSIONS	40
5.2 RECOMMENDATIONS	41
5.2.1 Recommendations for further studies	42
Reference.....	43
Appendix	47
Appendix A.....	48

LIST OF TABLE

Table 1.1 Asko project participant	3
Table 2.1.4 project success criteria adapted and update (Westhuizen, D. and Fitzgeraled 2005)	13
Table 4.1.1 Response rate	32
Table 4.1.2 Characteristics of the response	33
Table 4.2.1project time management tools	34
Table 4.2.2 project cost management tool	36
Table 4.2.3 Project management tools	38

ABBREVIATIONS AND ACRONYMS

CPM: Critical path method

EVM: Earned value management

P6: Primavera

PERT: Program evaluation review technique

PMBOK: Project management body of knowledge

PMI: Project management institution

PMTT: project management tools and technique

WBS: Work break down structure

ABSTRACT

Project management is very essential for project success. Different researchers stated that it has been a long time that project work started but the practices of project management have a long way to go especially in developing countries. Project management tools are methods or techniques that facilitate the project work. Construction projects play a vital role in the development of a country. This study was to assess the practices of project management tools in the 40/60 Asko condominium housing project. The purpose of the study is to fill the literature and practical gaps in the project management tools in the projects. Overall, the paper has six-chapter; all the chapters clearly explain the study. The descriptive research design describes qualitatively the assessment of project management tools practices on the Asko 40/60 condominium housing project. From the population, about 20 samples were selected using purposive sampling techniques. Twenty questionnaires were distributed and 19 were returned, analyzed, and presented. Likert scale was used in the closed-end questions and open-end questions were used to collect primary data. The collected data analyzed using the descriptive analysis method frequency, percentage, and mean. According to the analysis, the practices of project management tools on the Asko 40/60 condominium housing project are poor.

Keywords: project management, project management tools and techniques, Project time management, and project cost management,

CHAPTER ONE: INTRODUCTION

This chapter elaborates the overall study, by sub cataloging the background of the study, the background of the study setting, significance, purpose, scope, and limitation of the study, the objective of the study, and the organization of the study.

1.1 Background of the study

Project management is the managing of the project to satisfy a project objective. The project management institute (2004) defines project management as “the application of data, skills, tools, and techniques to project activities to meet the project requirement. It is accomplished through the applying and integration of the project management processes of initiating, planning, executing, monitoring and controlling, and closing.” In keeping with the national commonplace competence of project management (Pitas et al., 2010),”

A project manager has to be an expert at initiating, planning, executing, monitoring and controlling, and closing (PMI, 2008). To do so, project managers typically use several tools and techniques to manage a project life cycle. Several studies have suggested that proper use of project management tools and techniques affects the project success of a project (McMeekin et al 1998; Milosevic, et al 2001). However, the amount of utilization of project management and its tools are completely different in numerous countries, economic system sectors of organization sorts, as a project is unique.

The construction industry is one of the growing industries, which plays a vital role in the growth of once country economy so construction projects play a vital role in the growth of a country. The construction project involves a more complex process (Kpmg 2015). Construction project management is managing the construction project life cycle. It is concerned with the identification of the client’s interest and objective and utilize. It also monitors and controls the contributions to the project and their output, and evaluates the project based on the project satisfaction and other factors (Walker 1984). The uncertainty and complexity of the nature of the construction project need to explore or more tools and techniques for the performance and development of the project (Candido et al, 2014).

The success of project management is considerably captivated by the application of appropriate project management tools. Project management involves a variety of tools and techniques, where those mentioned within the project management standard by the 3 biggest branch organizations, project management Institute (PMI), International Project Management Association (IPMA) and comes in Controlled Environments two (PRINCE 2), can be considered as generally accepted (Patanakul et al,2010).

Ethiopia is one of the developing countries with high population growth. The combination of high population and urban growth rates coupled with a high prevalence of urban poverty has placed enormous strain on Ethiopian cities. 80 percent of the population lives in sub-standard slum housing that needs either complete replacement or significant upgrading. Ethiopian cities suffer from a high degree of environmental degradation, urban decay, a shortage of infrastructure and basic services, and high unemployment (Un-Habitat 2010). Addis Ababa, the capital city of Ethiopia also suffers. Since 2005, Ethiopia has been implementing an ambitious government-led low- and middle-income housing program: The Integrated Housing Development Programmers (IHDP). The initial goal of the program was to construct 400,000 condominium units, create 200,000 jobs, promote the development of 10,000 micro - and small - enterprises, enhance the capacity of the construction sector, regenerate inner-city slum areas and promote homeownership for low-income households. The program classifies as 20/80, 10/90, and later 40/60 projects were added. However, this program continues because it is unable to address the need of the people due to the rapid growth of the population in Addis Ababa.

In March 6, 2019, the Addis Ababa city administration transfer 51,229 condominium houses. The condominium houses were built under the 20/80 and 40/60 housing schemes. Out of the total condominium houses, 32,653 are in the 20/80 scheme while the remaining 18,576 are in the 40/60 scheme. Out of the 20/80 condominium houses, 1,248 are studios, 18,823 are one-bedroom, 7,127 are two bedrooms while the remaining 5,455 are three-bedroom condominium apartments. Addis Ababa condominium projects face many difficulties main difficulties are time overrun and cost overrun. Different researchers gave different reasons for the cause of cost overrun and time overrun but this study will assess the practice of PM tools in Addis Ababa 40/60 condominium projects related to the project success.

In project management, the main goal is to deliver the project within budget, scope, and planned time (Avlijas, 2015). Project success depends on how the project meets the required goals (Haseeb, 2011). Like other project construction project is said to be if it keeping the scope, schedule, and budget of the project within prescribed (Dhanashree,2015).

In Addis Ababa, two sub-city have 40/60 housing projects Bole and Gulele. In the Gulele sub-city, only Asko 40/60 housing project is currently under-construction. Asko 40/60 started in 2006 and currently around 9 blocks containing 980 houses having one bedroom 196, two-bedroom 588, and three-bedroom 196. In this construction process, four contractors and one consulting firm are participating.

Table 1.1 Asko project participant 1

No	Name of Contractor	Name of Consultant	Site Area	Typology	NO OF Block	House Type			Total
						One Bed Room	Two Bed Room	Three Bed Room	
1	ECBG	Edge	5.4	2B+G+13	4	22	66	22	110
2	Bright	Edge	5.4	2B+G+13	2	22	66	22	110
3	2Y	Edge	5.4	2B+G+13	1	22	66	22	110
4	Capstone	Edge	5.4	2B+G+13	2	22	66	22	110

The above table shows the Asko 40/60 condominium project participants and the block they have assigned. Totally four contractors and one consultant are participating in the construction of the nine blocks, which are under construction currently.

The study assesses the practice of project management tools in the Asko 40/ 60 condominium housing project. By associated with the iron time, cost, and project success and cost overrun and delay.

1.2 Statement of the problem

Projects are needed to be completed within the time frame, budgeted cost, and required quality. However, many projects in taking a long time to complete, cost more than necessary, and some projects are canceled because of inefficient planning and related challenges directly and/or indirectly related to it (Richard 2012). If the project takes a longer time than anticipated, it requires additional resources and budgets. This consequently increases labor, material, machinery, and equipment cost. This affects the budget of other projects and in general, it affects the economy of the country. Project failure is also the main challenge of our country's projects. The performance problems of a project (cost overrun, time delay, quality deficiency) are caused by either the selection, planning, execution, or control phase of the project and other factors.

According to Idoko (2008), many projects in developing countries encounter considerable time and cost overruns, fail to realize their intended benefit, or even totally terminated and neglected before or after their completion. Addis Ababa housing project is one of the few mega projects in Ethiopia, which are currently implemented by the Government of Ethiopia, and it is affected by the delay and cost overrun. According to Hiwot (2012), the projects fail because of the capacity of the contractor and its level of project management skill. In the paper, it is stated that the level of knowledge of the contractors in project management determines the fate of the projects in the Addis Ababa housing project. According to Yardley (2002), there are different reasons for projects to fail. Among these poor project management knowledge is one of the most common ones in projects. So, the planning practices of the projects should be improved and be systematized so that all projects can be successful. There are no many studies conducted in the field yet in the country. So, this research will help to see the gaps in project management tools and techniques of the project under study and will help to fill the same. After assessing the PMTT practices, this thesis recommends the best PMTT practices. Managing projects using project management tools will enhance project success.

In Addis Ababa, two sub-city have 40/60 housing projects Bole and Gulele. In the Gulele sub-city, only Asko 40/60 housing project is currently under-construction. Asko 40/60 started in 2006 and currently around 9 blocks containing 980 houses having one bedroom 196, two-bedroom 588, and three-bedroom 196. In this construction process, four contractors and one consulting firm are participating.

Different literature studies on the 40/60 condominium housing project mostly on the cost overrun and time over of the project. Sadik Mohammed's 2017 study on the planning tool used in the 40/60 condominium project but the study only assess the planning tool. but these studies focus on the project management tools and techniques associated with cost, time, and scope on the 40/60 Asko project. Also described the PM tools and techniques related to the project success. So there are both particle and literature gaps on the project management tools and techniques.

1.3 The objective of the study

1.3.1 General objective

The general objective of the study was to assess project management tools and techniques practices on the Asko 40/60 condominium house project.

1.3.2 Specific objective

1. To assess the applicability of Project Cost Management Tools in the Asko 40/60 condominium housing project.
2. To assess the applicability of Project Time Tools in Managing tools in the Asko 40/60 condominium housing project.
3. To assess any obstacles or challenges that happen by applying or adopting project management tools and techniques.
4. To assess any training given to enhances the knowledge of project management tools and techniques.
5. To assess is the given training given is helping the employees of the Asko 40/60 condominium housing project.

1.4 Research questions

1. What are the practices of project cost management tools used in the Addis Ababa 40/60 condominium housing project?
2. What are the practices of project time management tools used in the Addis Ababa 40/60 condominium housing project?
3. What kind of obstacles or challenges face by applying or adopting project management tools and techniques in the Asko 40/60 condominium housing project?
4. What kind of training given to enhances the knowledge of project management tools and techniques?
5. How the given training does help the employees of the Asko 40/60 condominium housing project?

1.5 Definition of basic terms

- **Project management:** is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements (*PMBOK 2013*).
- **Project management tools and techniques** are project management aids or method that helps to manage a project.
- **Project success:** is meet the scheduled time, cost, specification, satisfaction of the customer and value add (Winterand 2006).
- **Project time management:** is a process of ensuring the timely completion of the project by planning, organizing, and controlling the time required for each activity in the project (PBMOK 2000).
- **Project cost management:** Project Cost Management is a project management part that ensures the project is completed according to the planned budget (PIM 1996).
- **Project scope management:** is the process required to ensure that the project includes all the work required, and only the work required, to complete the project successfully (PMBOK 2000).

1.6 Scope of the study

To assess the project management tools and techniques in Asko 40/60 condominium housing project. This project is under the authority of the Addis Ababa Housing Administration Agency, which focused on project time management, and project cost management. The study only addresses the 40\60 Asko condominium housing project that is still in construction and is found in Addis Ababa.

1.7 limitation of the study

The study only addresses the 40\60Asko condominium housing project. Due to COVID 19 and Addis Ababa housing admiration agency structural reformation, it was difficult to timely access secondary data about 40\60 condominium housing project AA.

Because of COVID 19, only published literature was used due to unavailability to access unpublished literature. Since the project management concept is in the infant stage in Ethiopia, there is little information available about the subject matter. This research is restricted to include only a few project management tools and techniques.

1.8 Significance of the study

Conducting this assessment will have significance for students to explain the project management tools and techniques and to seek the project management tools and techniques practices in the Addis Ababa condominium housing projects. The study is also significant to the policymakers to force construction projects to use appropriate and updated tools and techniques.

Addis Ababa's condominium housing project is under the control of the Addis Ababa Housing Administration Agency. Addis Ababa Housing Administration Agency not only controls the condominium housing project but also other government construction projects in Addis Ababa. So, the research paper will show the practice of project management tools in the projects and also show the gap using the project management tools and their effect on project success. This will help the Addis Ababa Housing Administration Agency to minimize the gap in practicing project management tools.

On the other hand, the study discusses the importance of project management tools and techniques in a participatory project plan. Finally, will be somehow a base for interested researchers in the area to conduct a deep study and analysis.

1.9 Organization of the study

The paper contains five chapters. The first chapter contains a brief description of the study, the scope of the study, the objective, the research questions, and the significances of the study. The second chapter contains discussions of relevant literature that help the study. Chapter 3 contains the research methodology, data collection techniques, data analysis process. Chapter 4 is the analysis and result part, which deals with the questionnaire response rate, questionnaire response analysis, and summary. The last chapter, which is chapter five, contains the conclusion and recommendation of the study plus a recommendation for further studies.

CHAPTER TWO: LITERATURE REVIEW

This chapter presents relevant literature and prior studies that support the objective of the study and discussed this literature divided into two parts the theoretical and the empirical part.

2.1 Definition and Concepts of project management and Project management tools and techniques

2.1.1 Project

PMI (2000) defines a project as “a temporary endeavor undertaken to produce a unique product, service, or result.” A project is a “temporary endeavor...” refers that project needs to be done within a restricted time. Moreover, once it involves the main constraints of the project, we discover time along with cost and scope, which requires careful attention throughout the total project life cycle, throughout the planning phase, executing and monitoring and control before closing the project.

Lock (1987), indicated that Projects have been part of the human scene since civilization started. Although some may argue the concept of a project the construction of the Tower of Babel or the Egyptian pyramids were some of the first “projects,” or cave dwellers probably formed a project to gather the raw material for mammoth stew. However, it is certainly true that the construction of Boulder Dam and Edison’s invention of the light bulb was projected by any sensible definition. Modern project management, however, is usually said to have begun with the Manhattan Project. Morris (1994) stated that managing a project has been one of the oldest and most repeated accomplishments.

A project as a problem is scheduled for a solution. Alternatively, he defined a project as a problem-solving instrument and that failure to define the problem properly is what sometimes gets us into trouble. The desired objective is not a problem by itself rather the solution is the objective. The key to a problem is that there is an obstacle that prevents you from closing the gap. A problem is a gap (achieving your objective) between where you are and where you want to be, with an obstacle that prevents easy movement to close the gap. Therefore, problem solving consists of ways of finding or overcoming, or getting around the obstacle. Projects have specific characteristics and rules in comparison to operational work Contemporary literature outline such

findings and offer sample definitions, highlighting the uniqueness of every project. Projects are temporary organizations, established to achieve desired goals and objectives resulting in project teams being also temporary, redundant, or reassigned after the completion of the project (J.M.juran1999).

According to PMBOK (2000), a project has different characteristics. The first one is project is a one-time-activity whose main purpose is to solve a problem or to grasp an opportunity. Also, have start and endpoints. The project's success is highly affected by stakeholder participation. So, the project has to be managed properly. The project manager is a responsible person to manage a project.

The new PMBO Guide (2000) has added five new project management processes plan scope management, plan schedule management, plan stakeholder management, and control stakeholder management. United Nations Industrial Development Organization (UNIDO) has divided project cycles into phases and stages as follows. Pre-investment phase, Investment phase, and Operational phase. The Baum Cycle (adapted by the World Bank in 1970): Have five stages. The breakdown of the phases in the project cycle is artificial. In reality, the process is continuous and iterative. The phases are: Identification, Preparation (feasibility study), Appraisal, Implementation, and Evaluation – added after a certain period. It involves an ex-post evaluation.

New Project Cycle (World Bank 1994): It has four phases Listening- Listen to the stakeholders, Piloting- trying it on a small scale, Demonstrating- demonstrating the pilot, and Mainstreaming- duplicating the pilot.

2.1.2 Project management

“Project management is the 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” (PMBOK Guide, 2000). Project management involving strategic changes is likely to involve the use of management of change' tools and techniques as well as project management ones. This is because such projects often involve a change in the identity and culture of the library and information unit.

Project management is the planning, scheduling, and controlling of project activities to meet project objectives. The major objective of a project, in general, is that meeting the performance, cost, time while controlling or maintaining the scope of the project at the correct level. Project management is accomplished through the use of processes as initiation, planning, executing, controlling, and closing which are also the project lifecycle. Construction project management was defined by walker in 200 and later re-emphasized by Farrell (2008) as the planning, organizing and monitoring of a project from initiation to closing out (including commissioning) on behalf of a client requiring the identification of the client's objective in terms of utility, function, quality, time, and cost and the establishment of relationships between resources, integrating, monitoring and controlling the contributions to the project and evaluating and selecting a different alternative in pursuit of the client's satisfaction with the project outcome.

The application of project management practices has been identified as an effective approach that would help in improving competencies and efficiently complete projects (Arnabodi et al, 2004).

Construction project management is the planning, control, and coordination of a project from conception to completion (including commissioning) on behalf of a client. It is concerned with the identification of the client's objectives in terms of utility, function, integration, monitoring, and control of the contributions to the project and their output, and the evaluation and selection of alternatives in pursuit of the client's satisfaction with the project's outcome are fundamental aspects of project management. The success or failure of any construction project begins from the planning stage. While project management can be observed to be a growing discipline in Nigeria, periodic assessments of how projects are managed must be carried out from time to time. One way to assess how projects are managed is to assess the use of project management tools/ techniques in the execution of construction projects (Ayodele et al, 2015)

Windapo 2013 defines construction as a series of activities undertaken by construction companies (contractor and consultant) that produce or alter buildings, roads generally infrastructures. CDM (2015) defines a construction project as any other project, which includes all planning, designing, controlling, and management work involved in a project from the initiation until the project closing out and meet the client satisfaction.

In the project, there are core concept areas and knowledge areas. Moreover, managing the iron triangle is important in project management success. In addition, this paper more focuses on the planning and controlling of the iron triangles (time, cost, quality). A project plan cannot be simply prepared without applying methodology or tools. A methodology is an approach used to facilitate the preparation of the project plan. PIM (2013) revealed that organizations underestimate project management and put an inadequate focus on project management development. An effective approach that would help to improve management competencies is the application of project management in the project. (Arnaboldi et al, 2004).

Olateju *et al.* (2011), noted that because of the unique nature of a project there may not be a pre-existing blueprint for the project's implementation and a need to repeat the project once completed.

2.1.3 Construction project

In the construction industry, project management has recently become a contemporary issue (Ernest and Samule 2014). The acceptance and incorporation of project management in the construction industry have been slow in developing countries so it is still a premature stage of development (Abbasi et al 2000).

Construction project management was defined by Farrell (2008) as a process of planning, coordination, and monitoring from the initiation period to closing out of the project on the behalf of the client requiring the identification of the clients objective in terms of cost, quality utility, time, function, and the relationship between resources, controlling, integrating, and controlling the contributions to the project and their output and evaluation and selecting alternatives in pursuit of the client's satisfaction with project output.

2.1.4 Project success

Thomas et al (2008) state that measuring project success is not straightforward: "Examples abound where the original objectives of the project are not met, but the client was highly satisfied. There are other examples where the initial project objectives were met, but the client was quite unhappy with the results." The success of a project is different from one to the other. So generally, project success in a project is achieving the project objectives with the stated

schedule and budget. Different scholars highlight that project management has a role in achieving project success, but several other factors beyond the control of project management also affect project success (Peters and Horner 1997). The ultimate purpose of implementing project management is to make the project success full, but still, there is no agreed definition of project success the following table show different definition of project by different researchers:

Shenhar & Dvir (2001) explain project success measures time, on budget, meeting the specification, and the satisfaction of the customer. Winterand (2006) adds new project success measures as a value-creation aspect of projects.

Table 2.1.4 project success criteria 1 1 adapted and update (Westhuizen, D. and Fitzgeraled 2005)

	PROJECT SUCCESS CRIETERA							
	within time	within budget	user satisfaction	Specification quality	Project stakeholder satisfaction	Quality of project management	Net benefits from the project	Value-adding
Booch 1996	X	X	X					
Wateridge 1998	X	X	X	X	X		X	
Baccarini 1999	X	X	X	X	X	X	X	
Kerner 2002	X	X	X	X	X	X		
Thomsett 2002	X	X	X			X	X	
Marchewka 2003	X	X	X		X	X	X	
Shenhar& Dvir 2001	X	X	X	X	X	X	X	
Winter 2006	X	X	X	X	X	X	X	X

All of the researchers agree on the three project success criteria, which are time, budget, and user satisfaction. And Wateridge (1998) added specification of quality, project stakeholder satisfaction, and the net benefit from the project as one of the project success criteria. Baccarini (1998) supports Wateridge's success criteria and adds the quality of project management as another success criterion. Kerner (2002) only states project success criteria as with budget, within time, within the specified quality, project stakeholder management. Thomsett (2002) also with Baccarie's statement of project management success criteria except for the specification quality and project stakeholder management.

Marchewka 2003 pinout that for a project to be successful it should be finished within the planned time, within the budget, meeting customer and project stakeholder's satisfaction cost.

As traditional project constraints: time, cost, and quality are no longer sufficient, project success criteria and factors become more complex (Belassi & Tukel, 1996).

Murphy & Ledwith, 2007 suggested that as the project tries to be successful there should be clear identification between project success criteria and factors. A measure by which the success or failure of a project will be judged is the project success criterion. whereas success factors are defined as the inputs to the management system (Cook-davies, 2002).

2.2. Theoretical Literature

2.2.1 Project management tools and techniques

2.2.2 Project Time management

The time management process happens mainly in the planning phase, although the project duration and the milestones are already decided in the initiation phase, it is still the project manager's responsibility to plan the project activities and to meet the set project duration within the planned cost.

According to PMBOK (2000) project time management has five processes, these are:

- A) **Activity definition:** in this stage identification and documentation of activities that must be performed to produce the deliverables. Different inputs are needed these are, Work breakdown structure, Scope statement, Historical information, Constraints, and Expert

judgment. By using this information in this stage, the activity list, supporting detail, and work breakdown updates will be prepared.

- B) **Activity sequencing:** it involves the identification and documentation of logical relationships between activities. Different inputs are needed these are: Activity list, Production description, and Mandatory dependencies. And from this information, the project network diagrams and activity list updates will be prepared.
- C) **Activity Duration estimating:** in these stage times taken for each activity will be estimated by using past experiences of engineering method. Different inputs are needed these are: Activity list, Constraint, Historical information, resource requirements and capabilities, and Identified risk. the activity duration estimates, the basis of estimates, and activity list update will be prepared from the inputs.
- D) **Schedule development:** the starting and the finish date of project activities will be determined Different inputs are needed these are Project network diagrams, Activity duration estimates, Resources requirements, and Resources pool description by using this information in this stage, the project schedule, supporting detail, schedule management plan, resources requirement plan, and resources requirement updates will be prepared.
- E) **Schedule control:** is integrated with the other controlling it is checking if the project is going according to the schedule. Different inputs are needed these are Project schedule, Performance report, Change requests, and Schedule management plan. the schedule updates, corrective action, and lessons learned will be prepared.

To manage time management tools and techniques are used mainly Gant chart, Ms project, and P6 used in different projects. The development of schedules is often carried out through the use of project management software. If the previous estimations are made correctly the schedule development mostly consists of aggregating the information into one document (Antvik & Sjöholm, 2007). The schedule is one of the most important plans in a project. The development of time schedules should be based on the previously developed WBS. The level of work in planning, monitoring, and controlling schedules in a project is often directly reflected in the execution and outcome of the project (Antvik & Sjöholm, 2007).

To develop accurate and realistic schedules the activities must be decomposed and sequenced accurately. And activity sequencing involves identifying the relationship between the activities in

the project mainly the relationship is, start to start, finish to finish, start to finish, and finish to start (Guo-li, 2010).

The estimation of duration for the project should be based on the project scope, estimated resource quantity, and the availability of the resource. To get a more accurate estimated duration is should be done by a person or a group of people who are familiar with the project and the specific activities (Antvik & Sjöholm, 2007). The schedule control and development must be an iterative process for the project team to have updated schedules throughout the project (Guo-li, 2010). For project time management Critical path method, PERT, GERT, Gant charts, simulation, Monte Carlo analysis, buffer management, schedule crashing, milestone chart are used as time management tools (Newell 2002).

2.1.4.1 Project Cost management

Project Cost Management is a project management part that ensures the project is completed according to the planned budget (PIM 1996). Project Cost Management includes the processes required to ensure that the project is completed within the approved budget. According to PMBOK (2000) project cost management has five processes, these are:

- A) Resources planning: At this stage, the resource needed in the project will be determined, and also the quantity of the resources need is determined. Inputs used in these stage work break down, activity duration estimation, scope statement, and other project documents. and tool use is Expert judgment, project management software. the output for this stage is resource requirements.
- B) Cost estimating: taking a document from the resource's planning stage and using bottom-up estimation, parametric modeling, and other cost estimation tools and other supporting detail will be the output of this stage.
- C) Cost budgeting: it is the allocation of the overall cost estimate to individual work activity. input for this stage is cost estimates, work breakdown structure, project schedule, and risk management plan. Tools and techniques that can be used are cost budgeting too and the output is cost baseline.

D) Cost control: This is done after the project is started and it is controlling of the project cost. Inputs needed are cost baseline, performance report, change request, and cost management plan. tools used in this stage are cost change control system, performance measurement, earned value management (EVM). The output is revised cost estimates, budget updates, corrective action, and estimates at completion.

The project cost is very important as it affects the planning implementation of a project. So it is important to keep track of total cost as well as the cost of different work activities (Guo-li, 2010). A professionally developed budget does not only control the project costs but also creates good conditions for the development of a well-functioning cash flow in the project. The consequence of insufficient cash flow in a project is often connected to large extra costs and delays as there is a high risk for a temporary stop of the whole project (Antvik & Sjöholm, 2007).

To gain financial control of the project it is important to carry out proper cost control. The pre-calculated budget is the baseline of the financial aspects in the project but it is only with an updated and accurate control of the costs that the budget can be used effectively in a project (Antvik & Sjöholm, 2007). Cost control should include a comparison of planned value and the actual cost of each work package, but also include an analysis of the earned value for the costs spent on the project. A correctly performed analysis of the current financial status is necessary to develop forecasts of future, and final, costs of the project (Guo-li, 2010).

There are in general two methods of resource estimation; top-down and bottom-up. If the project has limited detailed information, the top-down method is often used. It is carried out by the higher management of the project and is based on experience from similar projects. The bottom-up method is also called qualitative-based estimations and involves each specific work category in the process. The bottom-up method is more time-consuming to perform, but often generates a more accurate result (Guo-li, 2010).

2.1.5 Project scope management

Project scope management includes the process required to ensure that the project includes all the work required, and only the work required, to complete the project successfully (PMBOK 2000). For scope, management Work breakdown structure, quality function deployment, and scope statement used as project management tools (Ludin, 1999).

According to PMBOK (2000), The following are the processes of project scope management:

A)Initiation: at this phase, the project will be authorized. the inputs in this phase are product description, strategic plan, project selection criteria, and historical information. Using project selection methods and expert judgment as a tool or technique the output will be project charter, project manager identification, constraints, and assumptions.

B) Scope planning: for the basis of future project decisions a written scope statement will be developed. the input is the product description project chart. Constraints and assumptions in the project a. and the tools and techniques used are product analysis, benefit/cost analysis, alternative identification, and expert judgment. By using these tools and techniques the outputs will be a scope statement, supporting detail, and scope management plan.

C) Scope Definition: subdivision of the project outputs to more manageable components. the inputs are product description, project charter, constraints, and assumption in the project. And for the tools and techniques product analysis, benefit/cost analysis, alternative identification, and expert judgment. The output scope statement, supporting detail, and scope management plan.

D) Scope verification: formalization acceptance of the project scope the inputs are scope statement, constraints, assumptions, and historical information. And for the tools and techniques that work to break down, structure templates, and decomposition. The output work breakdown structure and scop statement updated.

E) Scope change control: at this phase, any change in the scope is controlled or monitored. the inputs are scope statements, constraints, assumptions, and historical information. And for the tools and techniques work to break down, structure templates, and decomposition. The output work breakdown structure and scope statement updated.

2.1.6 Project management tools

Project Management tools are tools or techniques that help a project to effectively plan toward successful implementation. And also, project management tools are the best way to assess project management practices in various organizations is to assess the awareness of and use of various project management tools and techniques (Ayodeji and Samuel 2017).

No research could suggest the most effective or perfect tools in controlling risks, however, Chapman (1998), Thamhain (2013) and Patil et al. (2012) agreed that proper risk management tools with a proper application based on the project size and origination structure will reduce uncertainty or the negative impact of project risk

The application of project management tools. faces obstacles: especially in developing countries where the project management practices are low. There are several concerning problems within the project environment in developing countries these are wrongly identifying or preparing project management methods, inappropriate analysis, insufficient feasibility studies, technical assessment to provide essential information, and unclear objective project deliverables (Yanwen 2012).

Nguyen (2007) also states that developing countries are facing challenges to create an effective and smooth transfer of project management technologies.

Quynh (2018) in the study of an evaluation of project management tools and techniques in Vietnam pinout that work break down structure and Gantt chart are highly applicable project management tools than the other, however, the majority of the result show that PTT was rarely applied in the project.

2.1.6.1 Work breakdown structure

The WBS is breaking down a project into manageable work, or items, to ensure that all of the work elements needed to complete the project work scope are identified and manageable (Clements and Gido 2006). WBS serves as a framework for tracking costs and work performance because every element which is defined and described in it can be estimated concerning its costs and time needed, (Passenheim 2009). The breaking down of project tasks is

also called decomposition. Decomposition is the subdivision of project deliverables into smaller, more manageable components until the work and deliverables are defined to the work package level. The work package level is the lowest in the WBS and is the point at which the cost and activity durations for the work can be reliably estimated and managed. The level of detail for work packages will vary with the size and complexity of the project, PMBOK (2008). WBS is the best tool used for the de-composition project until the lowest level manageable This helps to determine the cost and time of the project also control (Battelle, 2006).

Even if there are different project management tools the project managers must choose the best that fit the project or a project management tool with necessary features among the other tools (Muhammd Sadiq et al,2015).

Several works of the literature evaluate a different kind of project management tools but not suggested which project management tool is best for kind of project (Sherlock et al,2009). Matthew J. and Brue (2003) on his study best management tools in which they evaluate the different project management tools and find MS project is widely used in the different project as project management tools. Joo tan et al (2008) also study on web project management tools by defining different criteria like the affordability, usage, and accessibility of the project management tool.

2.1.6.2 PERT

One important aspect of PERT allows us to identify the path through the network for which the total activity times are the greatest or the critical path. PERT, plication, is more suitable for research and development (R&D) projects with more emphasis on Development than it is on the Research side (Tooley and Dingle 2011).

Benefits of using a PERT Method include (NetMBA 2002)

- Improved planning and scheduling of activities.
- Identification of repetitive planning patterns that can be followed in other projects, thus simplifying the planning process.

- Ability to see and thus reschedule activities to reflect inter-project dependencies and resource limitations following known priority rules.

2.1.6.3 Gantt chart

Gantt charts are used to show calendar time task assignments in days, weeks, or months. The tool uses graphic representations to show the start, elapsed, and completion times of each task within a project. Gantt charts are ideal for tracking progress. The number of days required to complete a task that reaches a milestone can be compared with the planned or estimated number. The actual workdays, from actual start to actual finish, are plotted below the scheduled days. This information helps target potential timeline slippage or failure points. These charts serve as a valuable budgeting tool and can show dollars allocated versus dollars spent (project management techniques, 2002).

Benefits of using a Gantt chart include: [Using Gantt Charts 2002]

- Gives a visual display of the scheduled time of a task or activity which makes it easy to understand
- Enables better project control by promoting clearer communication.
- Shows the actual progress against the planned schedule.
- Can report results at appropriate levels.
- Allows comparison of multiple projects to determine risk or resource allocation.
- Rewards the project manager with more visibility and control over the project.

2.1.6.4 Earned Value Management Technique (EVM)

US defense department developed EVM techniques which are widely used as a tool of controlling and it is indicated by project management institutes (PIM) as a project performance measurement tool. PIM Provides a historical view on the evolution of the EVM tool as it departed from PERT/cost (1962, 1965), and cost schedule planning and control specification

(1967,1996) (Fleming and Koppelman 2010). Earned value analysis is mainly used in the controlling cost of the project. By using these tools, it will state if the project is under budget over budget. It can also be used in controlling the time of the project.

EVM focus on estimating the final cost and project duration, which is crucial for a manager to decided their reaction to overcome delays and cost overrun in a project (PMI 2005). EVM techniques do not project management tools that bring project again on schedule rater it shows whether the project is on schedule or not (Acebes et al. 2013). EVM uses a quantitative parameter that will allow the project manager to make a better and effective decision for the performance of the project (Kim, 2007). To apply EVM the project must be decomposed to manageable activities as a point of control then planned and scheduled down to a detailed work package level (Fleming, 2009).

2.1.6.5 MS project

MS Project is a software product designed for planning, controlling, and management of the various project activities that take shape in the form of schedules. The product allows all project activities (schedules, respectively) to be published on the MS Project Server within the company, which assists in the organization of work. With the help of the MS Project Server, team members receive from the Project Manager, the actual tasks, report on the progress of their performance, and communicate with each other (Carl C. Chatfield 2007).

Microsoft project has been developed to help to control the project by monitoring the progress and alerting the project manager if the project is not going according to plan or if it is going according to plan. Ms project has become widely used pc based pc based project management software (Damlan, 2002)

Ms project is an easy user interface and flexible to use. It also helps the manager to know the cost associated with every activity, track actual work in a project, a guide to set project plan correctly, time-saving and set a baseline to track the actual work of the project (Cael S. Chatfie and D.johnson, 2011)

Ms project doesn't indicate to place semi-flexible or inflexible constraints in their project for new project users. Such constraints severely hinder schedule flexibility (Cael S. Chatfie and D.johnson, 2011).

2.1.6.6 Primavera

Primavera is the best project management tool which includes multi-project planning and monitoring software. built on SQL, Oracle, and SQL Server Express server databases for organization-wide project management scalability. (Muhammad Sadiq and Muhammead Shahid, 2016).

Primavera is an effective assessment and overview tool, used as a cost reduction tool, to share resources from one activity to another (Jakov et al,200). Primavera user praised particularly on it continues to control, disciplined task logic, and able to work on complex projects (Robert 2010). A. Kastor and L. Sirakoulis (2009) Stated that primavera is the most effective because it allows users to define an unlimited number of criteria as priority rules. It also provides a single solution to the complexity of a project by managing the project size.

The cons of primavera are it has less tracking and more expensive compared to other similar tools (Robert et al, 2010). And also according to kirsi (2010) the defect management problem, in the beginning, was that the development features were prioritized over fault fixes by the scrum team members. To fix all the faults, they needed to dedicate one full sprint in the end just to fix the bugs that were left unfixed earlier.

2.2 Empirical Study

The theoretical part of this paper shows that project management is a very essential factor for the successful completion of projects. It is difficult to determine what is needed for projects to be completed as per the defined budget, cost, time, and quality if there is no properly defined project plan. Project success is a perceived measure, irrespective of the individual success criteria and factors. The achievement of project success, without utilizing project management tools and techniques is less (Assem Al-Hajj and Mario M. Zraunig 2018). So, the project management tool facilitates project success. The proper use of the tools and techniques will enhance the quality of the product or services that the organization will give or produce.

The lack of common uniform decision tools and techniques to measure performance indicators on construction projects for both private and government sectors in Tanzania is also a problem. This problem may arise when contractors claim for time extension with cost compensation due to failure of the performance contract. Contractors use traditional methods to forecast time and money for the completion of the project. This method formation is uncertain, which results in disputes between the parties and will affect the project and relationships. The study conducted by Wahoe (2012) show the value of construction dispute around the world in the year 2011 was just over the US \$32 million. There is a need for a reliable technique for control line performance of the construction industry in Tanzania Zanzibar. EVMS takes a step further than traditional measurement like PERT (Candido, et al, 2014),

The report presented by the Project Management Institute (PMI) (2013) revealed that organizations give little attention to project management. In the study, only half of the respondents (54%) say their 168 organizations fully understand the value of project management. It further revealed that Since 2008, the percentage of projects that project managers say have met their original goals and business intent has declined by 10% (from 72% in 2008 to 62% in 2012), which indicates a decline that project management practices have declined in these years.

Pulse the PMI Report (2013), also indicated the decline of training and development in project management has since 2010. Only a Fewer organizations are providing training on project management tools and techniques (from 65 percent in 2010 to 59 percent in 2012). Less than half

of the organizations have a process to mature existing project management practices (44%, down from 51% in 2010).

Milosevic, (2003) pinout that different literature suggests the use of PMTT such as project selection methods and project charter. For scope, management Work breakdown structure, quality function deployment, and scope statement used as project management tools (Ludin, 1999). Fleming and Koppelman, (2000) suggested that for project cost management, the use of cost estimating techniques and Earned Value Management. In quality management, a project manager has the options of benefit/cost analysis, flowcharting, cause-and-effect diagrams, cost of quality, Pareto diagrams, and control charts (Kliem and Ludin, 1999)

Critical path method, PERT, GERT, Gant charts, simulation, Monte Carlo analysis, buffer management, schedule crashing, milestone chart are projected time management tools(Newell 2002).

According to Milosevic (2003) Risk matrix, Monte Carlo analysis, decision tree analysis, checklist, SWOT analysis, and Delphi are some of the PMTT available for project risk management. Stakeholder analysis ad responsibility matrix used for human communication management and resources management.

Table 2.2 Research On PMTT 1

Thamhain (1999)	Identify PMTT by popularity Study on the identification of tools used, level of use, types of uses, satisfaction with the tools employed, level of training received, and adequacy of the tool's use
fox and Spence (1998)	Study on the identification of tools used, level of use, types of uses, satisfaction with the tools employed, level of
Besner and Hobbs (2004)	Identify how PMTT are used differently in different project situations
Coombs, et al., (1998)	Benchmarking the project management practices in R&D projects
White and Fortune (2002)	Identify the tools and techniques that are used by project managers and
Raz and Michael (2001)	Identify which risk management tools are widely used, associated with a successful project in general, and associated with effective project risk management
Quynh Le Hua Xuana et al (2018)	An evaluation of project management tools and techniques in Vietnam
SADIK MOHAMMED June 2017	An assessment of the project planning practices of Addis Ababa housing project in the sites project14, project13, kilinto, and head office

2.3 Summary

The literature is divided into two parts the theoretical and empirical. The theoretical part mainly focuses on the definition and general overview of the project management tools and techniques. And overall major project management tools and techniques are included in the questionnaires. The empirical part discusses mainly other researchers' results of their study on the project management tools and techniques.

Project is a way in which problem solved and opportunity is changing in to benefit. Project is believed to started in ancient times but the concept of project management is still young. Project management is a process of planning, organizing, controlling a project from the project initiation up to the project closing out. And the concept of project management is essential in managing a project successfully. So a project to successfully finish must be managed properly. Managing a project is the responsibility of a project manager but every stake-holder has their impact on the project management. Management. The construction project is a project where the result is either build, road, or infrastructure. It is unique as it is a project and highly affects the economy of one country.

Project management tools are aid that helps the project management process goes smoothly to attain project success. There are different project management tools available but no one project management tool is for one project. It is the project manager and the management staff to choose which project management tools to use for the project.

CHAPTER THREE: RESEARCH METHODOLOGY

This chapter of the paper provides an outline of the research methodology employed in the assessment of project management tools and techniques practices on 40/60 Asko condominium housing projects. The research design, Source of Data, Sampling and sampling techniques, Instrument of data collection and methods, and procedures of data analysis are described in this section of the study.

3.1 Research design and research approach

Research design is advanced planning of the methods to be implemented for collecting the relevant data and techniques used in the analysis of the collected data, keeping the objective of the study (McNabb, 2010). So research design is important to prepare research and it a way that reliable and accurate research is prepared. There are different research design methods but for this study, the descriptive research design was employed. Descriptive research design has been chosen because the major purpose of descriptive research is a description of the state of affairs as it exists at present and it reports what has happened or what is happening Kothari (1990). The study focuses on revealing the current practices of project management tools and techniques of the Addis Ababa 40/60 Asko condominium housing project.

Quantitative data was collected from the two stakeholders (contactor and consultant) using questionnaires using open-end question data are also collected.

3.2 Sample Size and Sampling Techniques

3.2.1 Research Population

The sample size was chosen out of the population to represent them. The sample size also dependent upon a time; available budget, the necessary degree of precision, and the person that concerns the subject matter.

Two sub-sites in the construction bole and Gulele and around 10 sites. But the studies only focused on the Gulele sub-city Asko site. On the site, there were 4 contractors and one consultant. All the contractors are grade 1 contractors and working on the same typology. A total

of 80 employees are working in the Asko project this population does not include contract employees.

The sample size was chosen out of the population to represent them. The sample size also dependent upon a time; available budget, the necessary degree of precision, and the person that concerns the subject matter. According to Creswell (2009) population is the group of interest to the researcher or who the researcher wants to collect data from. So, the population of the study is 20. These are selected because these are employees who are directly related to the management of the project.

3.2.2 Sampling Techniques

In obtaining information for the research. In this sampling method individuals, who will be participating in the filling of the questionnaires' will be individuals who participate in the management of the project. This sampling technique will help to gather adequate information from the population regarding the study. So using purposive sampling techniques 20 samples were selected. When using the purposive sampling techniques sample were taken based on their importance to the study.

3.3Data Sources

Both the primary and secondary data sources were used but mainly primary data were used in conducting the research. The primary data were collected using questionnaires from the contractors and consultants. And the secondary data were collected from the client or the Addis Ababa housing administration agency and the reports and site diary of the contractors and consultants.

3.4Data Gathering Instruments

Questionnaires were prepared and distributed to the contractor and consultant. unstructured interviews were conducted after analyzing the questionnaire's response.

3.4.1 Designing the Questionnaire

The Questionnaire consists of two sections the first section gathers general information about the respondent. And the second section has a four-part focus on the practices of project management tools in the site. The questionnaire is prepared in the English version as the respondent are expected to be literate.

Totally 29 questions were prepared for the questionnaires. Both open and closed-end questions were prepared on the questions. The closed-end question was prepared 5-point Likert scale of strongly agree, agree, neutral, strongly disagree, and disagree. And open-end questions were prepared to collect any missing inform the closed-end questions The respondents were instructed during the administration of the questions by the researcher. So there will not be any confusion.

3.5 Method of Data Analysis

After the data are collected from a questionnaire was coded and analyzed using Descriptive statistics including frequency and percentage were used to report the profiles of participants to provide a comparative representation of the findings for the research question. How related to the questionnaires.

For the qualitative data, the key aspects of the study were analyzed thematically, guided by the study objectives, then statements of how the themes could be correlated on the performance of an implementation of livelihood projects were made.

3.6 Validity and Reliability

Validity and reliability is an important aspect of the research instrument and they must be considered to ensure that accurate results are obtained (Kothari, 2009).

Validity refers to the extent to which a tool represents all aspects of given social concepts. Expert judgment is the primary method used to determine whether a test/tool has content validity. Statistical tests are not employed here. If content validity is acceptable, one can proceed to face validity. Refers to the extent to which a measure yields the same number or score each time it is

The internal consistency of the study can be checked using Cronbach's Alpha (De vellis1991). The interpretation of the Cronbach alpha coefficient is if it is less than 0.6 the reliability is considered to be poor if it is with the range of 0.7 up to 0.8 considered acceptable reliability and if it is over 08 it is considered good Sekaran (2000). For this study, the Cronbach alpha coefficient was 0.79 which is considered acceptable reliability.

3.7 Ethical consideration

The right of the individual respondent to give information that he/she only wants to tell about was respected. So, there was no influence on the respondents. Personal information obtained from the respondents was kept secret. Generally, necessary precautions were taken to eliminate or minimize any possible harm to the respondents and the study community.

During the survey, the respondent was not influenced by both the researchers and other parties. And any personal information obtained from the respondent was kept secret. Generally, necessary measures were taken not to harm the respondent and also obeying rules and regulations in preparing the study.

CHAPTER FOUR DATA ANALYSIS, PRESENTATION, AND INTERPRETATION OF FINDINGS

This chapter deals with the analysis results of the questionnaire survey and questionnaire response rate. Furthermore, present the result of the study on the assessment of project management tools on the Asko 40/60 housing project.

4.1 Response rate and characteristics of respondents

Asko 40/60 housing project has 5 contractors and one consultant. All the contractors except but two contractors were not on the site because the site has been inactive so the two contractors did not participate in the questionnaires' survey so 3 contractors participated. And only employees who are directly related to the management of the project participated.

Table 4.1.1 Response rate 1

		Frequency	percentage
Contractor	No of questionnaire	15	100%
	Return	14	93%
	Non return	1	7%
	Total	15	
Consultant	No of questionnaire	5	100%
	Return	5	100%
	Non return	0	0%
	Total	5	

20 questionnaires were distributed and 19 were returned. The analysis is done on the returned questioners. Getting General information about the questioners' respondents was also part of the question that helps to check the reliability of the information the respondent was given. The following tables are the general information of the respondent who participated in the study.

Table 4.1.2 characteristics of the response 1

Demographic type	Variables	Frequency	Percent
Age	below 30	9	47%
	31-40	8	42%
	41-50	2	11%
	above 50	0	0%
	Total	19	
Academic qualifications	Diploma	2	11%
	Degree	14	74%
	Masters	3	16%
	Total	19	
Experiences	0-5 years	7	33%
	6-10 years	5	24%
	11-20years	6	29%
	21-30 years	3	14%
	30 years and above	0	0%
	Total	21	

From the total population 47% are below 30 years, 42% between 31-40, and 11% between 41-50 years of age. Based on the Year of experience 37% are between 0-5years, 26% between 6-10years, 21% between 11-20 years, and 16% 21-30 years of experience. The level of the education diploma 11%, 1st degree 74%, and master degree 16%. A high number of respondents have 1st degree, 0-5 years of experience, and between 31-40 years of age. So as the result of the analysis shows the employees whose works are directly related to project management are young and have a first degree. So by giving continuous on-job training, using benchmark methods, and through experiences, the practices of project management tools will develop.

There are 27 questions in the questionnaires. And the 11 questions are prepared using the Likert scale. The following is the analysis of the answer to the questions prepared using the liker scale.

4.2 Practices of using project time and cost management tools.

4.2.1 project time management tools

Table 4.2.1 project time management tools 1

Statement	Response	frequency	%
Project Time management			
Time management tools and techniques are effectively used in the project	Strongly disagree	16	84%
	Disagree	0	0%
	neutral	3	16%
	Agree	0	0%
	Strongly agree	0	0%
	Total	19	100%
Employees who work in the organization are well familiar with advanced project management tools and techniques.	Strongly disagree	6	32%
	Disagree	1	5%
	neutral	8	42%
	Agree	4	21%
	Strongly agree	0	0%
	Total	19	100%
MS project is used as one of the time management tools in the project.	Strongly disagree	6	32%
	Disagree	7	37%
	neutral	1	5%
	Agree	2	11%
	Strongly agree	3	16%
	Total	19	100%
P6 (primavera) is used as one of the time management tools and techniques	Strongly disagree	7	37%
	Disagree	7	37%
	neutral	0	0%
	Agree	5	26%
	Strongly agree	0	0%
	Total	19	100%
Training is given to the employees to enhance the knowledge of employees about time management tools.	Strongly disagree	1	5%
	Disagree	1	5%
	neutral	1	5%
	Agree	14	74%
	Strongly agree	2	11%
	Total	19	100%

The above tables show the result of the questions from the questionnaires. Whereas 1 represents strongly disagree, 2 represents disagree, 3 represents neutral, 4 represents agree, and 5 represents strongly agree with the question. For project time management, 84% of the respondent agree that is there no effective use of project time management in the project. 37 % of the respondents strongly disagree, 32% Disagree with the use of the MS project in the Asko housing project. 11% agree and 16 strongly agree that they use MS project on-site. 37% of the population strongly disagree and 37% of the population disagree P6 is used in the project to manage time. 26% of the population agree that they use p6 in the project. 81% agree and 18% strongly agree that training is given to the employees to enhance their knowledge on the project time management tools. So general the prices of project management tools are poor on the site, even if the respondents agree that training is given to enhance.

4.2.2 project cost management tools

Table 4.2.2 project cost management tool 1

Statement	Response	frequency	%
Project Cost management			
Cost management tools and techniques are effectively used	Strongly disagree	7	37%
	Disagree	3	16%
	neutral	9	47%
	Agree	0	0%
	Strongly agree	0	0%
	Total	19	100%
Project planning tools are applied while planning	Strongly disagree	0	0%
	Disagree	12	63%
	neutral	5	26%
	Agree	2	11%
	Strongly agree	0	0%
	Total	19	100%
Training is given to the employees to enhance the knowledge of employees about cost management tools.	Strogly dissagree	0	0%
	Disagree	10	53%
	neutral	2	11%
	Agree	6	32%
	Strongly agree	1	5%
	Total	19	100%
The employees have better knowledge about earned value management	Strongly disagree	0	0%
	Disagree	9	47%
	neutral	8	42%
	Agree	1	5%
	Strongly agree	1	5%
	Total	19	100%
In selecting a project effective cost management tools and techniques are used	Strongly disagree	10	53%
	Disagree	1	5%
	neutral	3	16%
	Agree	5	26%
	Strongly agree	0	0%
	Total	19	74%
One of the reasons for a project to fail to meet the targeted budget is not using proper and advanced cost management tools	Strongly disagree	0	0%
	Disagree	0	0%
	neutral	1	5%
	Agree	7	37%
	Strongly agree	11	58%
	Total	19	100%

To assess the practices of Project cost management there were questions in the questionnaires which the result is shown in the above tables. For the effective use of cost management tools 37% strongly disagree, 16% disagree, 47% neutral. Of the population, 63% disagree that project planning tools are applied while planning the project. Of the population, 53% disagree and 32% agree that training is given to enhances the employee's project cost management tools knowledge, for the question that employees have good knowledge about the EVM and 47% disagree, 5% agree and 5% strongly agree. 58% of the population strongly agree that the project fails because there is no effective use of project cost management tools and techniques. Overall the project also has poor project cost management tools and techniques. And agree that the project fails because of improper or not using the project management tools and techniques in the project.

Even if training is given the practices of project management tools are very poor. Mostly off-job training is given. It is better to have on-the-job training and using other organizations as a benchmark.

Sadik Mohammed (2017) in his study of “an assessment of the project planning practices of Addis Ababa housing project site project 14, project 13, Kilinto and head office” also stated that the practices of project management tools on the project is poor. Which support the study result that the practices of project management tool in Asko 40/60 condominium house are poor.

From the most used project management tools the MS project is the first one in the Asko 40/60 condominium housing project. Sadik Mohammed (2017) stated that MSproject is mostly used tools than other project management tools in Addis Ababa 40/60 condominium project. Which supports the result.

Table 4.2.3 Project management tools

No	PM TOOLS	PM Tools currently using in the organization		PM TOOLS prefer to use in a workplace	
		Frequency	percentage	Frequency	percentage
1	Ms project	3	16%	4	21%
2	Primavera (p6)	1	5%	5	26%
3	Earned value management	0	0%	3	16%
5	Gant chart	8	42%	2	11%
7	Work break down structure	8	42%	3	16%
8	Stakeholder analysis			2	11%

From the population, 16 % use MS project, 5% use Primavera (P6), and 8% work break down structure use the project management tools. And 21% of the population prefer to use MS project, 26% of the population prefer to use primavera (P6), 16% of the population prefer to use EVA, 11% of the population prefer to use Gant chart, 16% of the population prefer to use work break down structure and 11% of the population prefer to use stakeholder analysis. Gant chart and work break down structure are mostly used in the project. P6 and Ms project preferred to used by the participants.

4.3 Challenges to applying PMTT

Using PMTT in managing a project will help the project to achieve its objective. But there is no guideline for a project to choose one PMTT from the other. As the nature of the project is unique one PMTT will be the best tool to use but it might not be best for the other. The project manager is left with choosing which project management tool to use in the project.

Different reasons hinder the employees from using the project management tools one of the reasons is that traditional project management practice in the site. And the contractor only focused on their profit the result rather than the process. The other reason is improper employment. Which result in unable to use the project management tools because of little knowledge about the project management tools.

CHAPTER FIVE CONCLUSION AND RECOMMENDATION

5.1 CONCLUSIONS

The main objective of this research was to assess the project management tools on the Asko 40/60 housing project. The questionnaire was conducted to assess the overall project management tools practices in the site.

Construction projects affect the economy of the country. Proper utilization of project management tools is needed. Project management is very essential for project success. And the project is managed using different tools and techniques. Project management tools are an aid that helps the project management process. So it is related to the project's success. For a project to successfully finish the project manager should manage the project using the best-suited project management tools.

The project management concept is young, especially in a developing country. Project management tools are an aid that helps the project management system. So assessing the project management tool is another way to tell or show the project management practices of that certain organization or selected site. The data collected and analyzed show that there are poor project management tools in the Asko 40/60 project.

Asko 40/60 housing project did face both costs overrun and time overrun. As the result indicated the practices of both project time management tools and project cost, management tools are poor on the site.

Different reasons hinder the employees from using the project management tools one of the reasons is that traditional project management practice in the site. In addition, the contractor only focused on their profit the result rather than the process. The other reason is improper employment. Which result in unable to use the project management tools because of little knowledge about the project management tools. Even if training is given to enhance the practices of the employees about the project management tools.

Milosevic, (2003) pinout that different literature suggests the use of PMTT such as project selection methods and project charter. For scope, management Work breakdown structure,

quality function deployment, and scope statement used as project management tools (Ludin, 1999). Fleming and Koppelman, (2000) suggested that for project cost management, the use of cost estimating techniques and Earned Value Management. In quality management, a project manager has the options of benefit/cost analysis, flowcharting, cause-and-effect diagrams, and cost of quality, Pareto diagrams, and control charts (Kliem and Ludin, 1999). Critical path method, PERT, GERT, Gant charts, simulation, Monte Carlo analysis, buffer management, schedule crashing, milestone chart are projected time management tools(Newell 2002). There are different project management tools available and different researchers study the tools.

The developing country gave less attention to the project management tools, which mostly result in project failure, or cost overrun and time overrun.

5.2 RECOMMENDATIONS

Projects are a way of solving problems. The condominium housing project also developed because there is a shortage of houses in Addis Ababa. But still, these projects did not eliminate the problem due to mainly the project hinder because of cost overrun and time overrun.

Even if training is given the practices of project management tools are very poor. Mostly off-job training is given. It is better to have on-the-job training and using other organizations as a benchmark. And they have to check their human resources management system. Prepare job specifications and job descriptions and follow these in their employment and promotions of staff.

As for the contractor, project success is not only getting profit from the project rather the project has to meet its objective effectively and efficiently. So managing the overall project using project management tools will help the contractor not only meet the project objectives but also enable them to effectively utilize materials and minimize cost.

Overall the government also plays a vital role in these projects. It is also the government's responsibility to check the performance and overall process of the project. And set regulations and rules in the construction sector so that contractors and consultant update the system and use advanced project management processed in order to coup with the regulations.

5.2.1 Recommendations for further studies

The study concentrated on assessing the project management tools and techniques of the Asko 40/60 condominium project. Which focused on the main project time management and project cost managing tools. Therefore, other researchers can study the other project management tools. Also can study the impact of the project management tools and techniques on the project success and failure or the relationships between the project management tools and project success.

Project management tools and sequences are ways implementing project management. And project management is not well developed in developing country like Ethiopia so other research can study the reason the these developing countries have not use or develop the concept of project management tools.

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Appendix

Appendix A

QUESTIONNAIRE FOR SURVEY

TITLE: ASSESSMENT OF THE PRACTICE OF PROJECT MANAGEMENT TOOLS ON BUILDING CONSTRUCTION IN ADDIS ABABA

Dear respondent,

This questionnaire has been designed to collect data for the study of “Assessment the practice of project management tools on building construction in Addis Ababa. ” The study is conducted to achieve a master's degree in St. Marry’s university. Your response to each question is vital for the effectiveness of this study. So please respond to the questions honestly by ticking the most appropriate response.

As a researcher would like to assure you that your response to the questionnaire would be kept confidential and it has no intention except for academic purposes. Please don't write your name or any personal identifier on the questionnaire. For any clarification needed, please contact me on the below telephone number and email.

I would like to thank you in advance, for completing this questionnaire and assisting me in my project work.

Yours Sincerely

Meron lemma.

Mobile: - 0913791313

Email:-meronlemma@gmail.com

Instructions: Please answer the following questions based on your experience in building construction in Addis Ababa. Please tick[x] in the provided space the most suitable answer using the given scale. Please also answer all the questions considering the projects you are participated in to enhance the objectivity of the project work.

SECTION 1: PERSONAL DETAILS OF THE RESPONDENT

Q.1Age: 20-30 31-40 41-50 50 and above

Q.2. What is your level of education?

Diploma 1ST Degree Master's Degree

Others (specify).....

Q.3. How long have you been working with the organization?

0-5 years 6-10 years 11-20 years 21-30 years 30 years and above

Q.4. What is your organization grade?

Grade 1-2 Grade 3-4 Grade 5-6 Grade 7-8

Q.5. your organization is?

Contractor consultant

Q.6. What is your position in the company?

.....
.....
.....

Q.7. What is your educational background?

.....
.....
.....

SECTION 2: Project management tools and techniques

Instructions: Please answer the following questions based on your experience in the Asko 40/60 condominium housing project. Please tick[x] in the provided space the most suitable answer using the given scale. Please also answer all the questions considering the projects you are participated in to enhance the objectivity of the project work.

PART I: Questions on practices of project Time management tools and techniques of the Addis Ababa housing project.

	Description	Scale				
		Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
8	Time management tools and techniques are effectively used in the project					
9	Employees who work in the organization are well familiar with advanced project management tools and techniques.					
10	MS project is used as one of the time management tools in the project.					
11	P6 (primavera) is used as one of the time management tools and techniques					
12	Training is given to the employees to enhance the knowledge of employees about time management tools.					

Q.13.List the major project time management tools and techniques used in your organization?

PART II: Questions on practices of project cost management tools and techniques of the Addis Ababa housing project.

	Description	Scale				
		Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
14	Cost management tools and techniques are effectively used					
15	Project planning tools are applied while planning					
16	Training is given to the employees to enhance the knowledge of employees about cost management tools.					
17	The employees have better knowledge about earned value management					
18	In selecting a project effective cost management tools and techniques are used					
19	One of the reasons for a project to fail to meet the targeted budget is not using proper and advanced cost management tools					

Q.20.List the major project cost management tools and techniques used in your organization?

PART III: Questions on practices of project management tools and techniques

No	PM TOOLS	PM TOOLS prefer to use in a workplace	PM Tools currently using in the organization
21	Ms project		
22	Primavera (p6)		
23	Earned value management		
24	Six sigma		
25	Gant chart		
26	PERT		
27	Work break down the structure		
28	Stakeholder analysis		

Q.29.List the major challenges that you face in applying project management tools and techniques in your organization?

Thank you for your time

