ST. MARY'S UNIVERSITY
SCHOOL OF GRADUATE STUDIES

ASSESSMENT ON CHALLENGES OF EthERNet PROJECT IMPLEMENTATION: THE CASE OF MINISTRY OF EDUCATION

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TIRUWORK TEREFE HABTE
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A THESIS SUBMITTED TO ST. MARY'S UNIVERSITY, SCHOOL OF GRADUATE STUDIES IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE_OF_MASTER OF ARTS IN PROJECT MANAGEMENT (MA)

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APPROVED BY BOARD OF EXAMINERS

Dean, Graduate Studie	Signature	Date
Advisor	Signature	Date
Internal Examiner	Signature	Date
External Examiner	Signature	Date

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ACRONYMS AND ABBREVIATIONS

EthERNet	Ethiopian Education and Research Network
PMBOK	Project management body of knowledge
UNESCO	United Nations Educational Scientific & Culture Organization
OECD	Organization for Economic Co-Operational & Development
PMI	Project Management Institute
PMO	Project Management Office
MOE	Ministry of Education
RII	Relative Importance Index
SAS	Statistical Analysis Software
MCIT	Ministry of Information communication Technology
ICT	Information Communication Technology
IT	Information Technology
GOE	Government of Ethiopia
GTP	Growth and Transformation Plan
ZTE	Zhongxing Telecommunication Equipment Corporation
IS	Information system
Ethio Telecom	Ethiopian Telecommunication

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ABSTRACT

As the researcher preliminary assessment shows IT projects at Ministry of Education are exposed to time and/or cost overrun. Thereby, it becomes difficult to complete IT projects in the allocated cost and time. Therefore, this research was carried out to identify factors that affect the success of EthERNet project . Thus, the paper aims at pointing out factors contributing for the success of EthERNet project. Factors were identified from the view point of two groups, vender (Zhongxing Telecommunication Equipment Corporation) and Ministry of Education (owner) of project participants. For this effect six branches of Addis Ababa University which implemented the project were targeted. As to the approach mixed approach was applied and purposive sampling technique was the strategy for sampling. Both descriptive and correlational analysis were used for analysis purpose. A total of 42 respondents filled the questionnaires from owner (Ministry of Education) and vender(ZTE).From the result, it was found that the most important factors which affect the success of project were found to be top management support,user involvement ,experienced project manager, clear business objectives, project scope ,standard infrastructure, firm basic requirements, formal methodology and reliable estimates besides that it was found that there is consensus of opinion in ranking of factors according to the level of importance between owner versus vender respondents on the factors that affects the success of the project. The study concluded that all the factors listed above strongly affect the success of the project. What is more, the study concluded that there is a strong correlation in ranking of factors on the responses of owner and vender respondents.

Key words: IT project, EthERNet, Ministry of Education, Ethiopia

CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

A project in its basic definition is a temporary endeavour undertaken by people who work cooperatively together to create a unique product or service within an established time frame and within established budget to produce identifiable deliverables(Project Management Institute, 2000).

Due to the rapid development of IT industry, people today have hugely recognized the importance of implementation of IT projects. IT/IS project management often encounter many issues, such as rapid technological upgrade, fast changes in the environment and frequent movement of people.

In pursuit of the vision, the government of Ethiopia(GOE) proceeds to outline how Science, Technology and Innovation will be harnessed to stimulate technological and industrial transformation that will lead to sustained economic growth of 10 per cent per annum (GTP II, 2016).Among the industries that have been quick to adopt and ride on this new technology wave is the Education and Research Center. Because of this, Government and educational institutions are looking for innovative ways to increase access to higher education and improve the quality of their programmes and courses in a bid to improve their competitiveness (Lay Cheng Tan, 2013).

In order to build capacity of public universities to share educational resources and research among member institutions locally and globally, EthERNet was initiated in 2007 by the Ministry of communication and information technology as part of a national capacity building program. EthERNet is an Ethiopian NREN (national research and education network) . It Initially focused on the development of ICT infrastructure for public universities to share educational resources locally and globally and providing tele-education & tele-medicine that enabled the delivery of many types of trainings, classes and meetings.

EthERNet was launched to build and deliver highly interconnected and high-performance networks for Universities and other Educational and Research Institutions in Ethiopia. More specifically, EthERNet was aimed to build and deliver high performance networking that connected these institutions with each other and similar institutions in the world, and by doing this to enable them to share educational resources and collaborate both

within Ethiopia and globally and helping address and overcome the critical shortages of resources.

A key reason that enables EthERNet to play such a role in carrying all network traffic of Ethiopian higher education, is the government funded project which costs more than $60 million, to deliver fast and reliable networking services to the thirty-six public universities and institute of technologies across different regions of the country. The Newly built EthERNet network function separately from the existing commercial service provider (Ethio Telecom) network and deliver 10 Gbps bandwidth connectivity between the universities.

1.2 Project success criteria

A differentiation should be made between the two related concepts which are: success criteria and success factors. First, relevant success criteria have to be identified and then, success factors should be determined in order to increase the chances of project success (Müller, Turner, 2007). Success criteria are defined by Muller and Turner (2007) as variables that measure project success. Since project success might be perceived diff erently by stakeholders, there is a need for comprehensive criteria that refl ect their interests and views (Dvir et al., 1998). Westerveld (2003) emphasises the importance of stakeholders' satisfaction as a main success criteria, complementary to the golden triangle of time, budget and quality, and adds that diff erent time lags should be considered. Establishing a set of criteria applicable to any type of project is unrealistic (Mir, Pinnington, 2014). Although certain criteria might be relevant in measuring the success of most projects, they should be adapted to size, complexity, duration, type and stakeholders' requirements.One of the success conditions mentioned by Davis (2004), based on a comprehensive literature study, is that "success criteria should be agreed on with stakeholders before the start of the project, and repeatedly at configuration review points throughout the project".

1.3 State of higher education and research in Ethiopia

There has been a rapid transformation and massive expansion of higher education in Ethiopia over the last 13 years, that increases the number of universities and enrolments. From 2004 to 2016 the number of public higher education institution has increased from 8 to 36 and the number of private higher institutions reach to 5 universities and 107 colleges. With an

ambitious plan to become a middle-income economy by 2025, Ethiopian governments are investing a lot in research and education, because the economic growth in moving to industrial and service economies from agriculture, demands different skills and new knowledge. (Assefa, 2017).This remarkable expansion has created opportunities for rapid increases in intake capacity. The total enrolment in undergraduate programs in both government and private higher education institutions increased hastily and reach to 778,151 by 2016. The total enrolment of second degree program in Ethiopian higher education reached to 37,152 by 2015. However, the gross enrolment rate has not improved considerably still it is 10.4%.(Felix Bankole and Zelalem Assefa , 2017).

Despite massive resource allocations to higher education, universities still report insufficient supplies of text & reference books, laboratories & workshop equipment and access to ICT facilities, (Federal Ministry of Education Report, 2016/17). To improve the quality of higher education, several initiatives have been implemented including harmonizing curricula for all the undergraduate programs, adopting a modular approach for course delivery to enhance active learning, opening institutional Quality Assurance Offices at each university, equipping libraries & laboratories and implementing ICT infrastructure. A well-qualified and highly motivated faculty is critical to the quality of higher education institutions. Unfortunately, even at leading universities in developing countries, many faculty members have little, if any, graduate level training. This limits the level of knowledge imparted to students and restricts the students' ability to access existing knowledge and generate new ideas, (World Bank, 2000).

According to Proclamation 650/2009, research and community service are the second and third mission of all higher education institutions in Ethiopia in addition to teaching. Since the main target of universities is to generate research and produce graduate students. However, financial support to research is low. In 2011/12, the research allocation of all universities accounted for only 1% of their total budget.

1.4 Statement of the problem

ICT projects are given some attention by government of Ethiopia, now days. However, no or little is said about their implementation. This research is initiated as a result of personal exposure to and, hereby, personal observation of different ICT projects (see, for example,2016/17 annual reports of FDRE Ministry of education and Ministry of Communication and Information Technology) The researcher has observed delay of many

ICT projects and has been curious about the why. What is more, the researcher was unable to find adequate research works on the issue. However, the project owner ministry did not assess what factors contributed to such delay. What is more the researcher found inadequate concern is given to the issue of by other concerned bodies. Hence, it is imperative to work on such an issue and identify major factors for project implementation. On the way, may help as reference for other similar works.

Accordingly, this research aims at identifying important factors for successful ICT project implementations. For this effect, EthERNet was selected as a sample ICT project to deal with in terms of factors affecting success.

1.3 Research Questions

This study attempt to answer the following research questions:

- What are the most important factors which influence the success of the EthERNet project?
- How do the EthERNet project participants (Owner, Vender) rate the success factors (their views)?

1.4 Research Objectives

1.4.1 General Objective

To identify the factors affecting success of EthERNet project at the Ministry of Education and to give a suggestion to the project office in order to increase the performance of project implementation for the future.

1.4.2 Specific Objectives

The objectives of the study are to identify the main factors of projects' success.

- To identify the factors which influence the success of EthERNet project.
- To investigate the views of different project participants (owner and Vender) and rank the identified factors.
- To evaluate the degree of agreement /disagreement regarding the ranking of these factors between the participants.

1.5 Hypothesis

This section states about the prediction of the outcome. It states the directions of the study.A researcher wants to examine the relationship of different success factors (independent variable) and project success (dependent variable) in EthERNet project at Ministry of Education(MOE).

The purpose of a hypothesis test is to avoid being deceived by chance of occurrences. The tests will also help to evaluate whether consensus of views exist among respondents. To test the agreement of paired respondents on ranking of factors contributing for success of EthERNet project, the researcher will teste the following hypothesis.

HA : there is no agreement in the ranking of factors contributing for project success between two groups of respondents (owner versus vender) .

Ho : there is agreement in the ranking of factors contributing for project success between two groups of respondent's (owner versus vender).

1.6 Significance of the Study

The results of this study will be of great help to the top management team at Ministry of Education who will use it to better understand the determinants of project success within their organization. The studys output shall also be used as a reference point for all future MOE project managers who will use it to better plan and resource their own projects.Stakeholders within the Ministry of Education and in particular all public univeristies ,Institutions and colleges under MOE will be keen to understand what affects EthERNet project performance within their institution and the study's findings will go a long way in providing this clarity .Finally, the results of the study shall form a foundation upon which future researchers on the subject can build on or borrow from.

1.7 Scope of the Study

The scope of this study was confined on six universities and college which is found in Addis Ababa city from the perspectives of owner and contractors that was approached for questioners to identify the factors which affect the success of project. Due to the limited time allocated and budget constraints, the study did not cover thirty-six public universities and

institute of technologies across different regions of the country which is expected to be benefited from the EthERNet project.

1.8 Limitations of the study

This study was conducted with some sort of limitations. One of the limitations of the study was unavailability of research literature on the information technology project in Ethiopia.The researcher was faced many problems which, in fact, may affect the quality of the study. the following limitations were expected**:** unwillingness of the respondent to fill the questionnaire, delay in returning back the questionnaire, unavailability of well-organized secondary data that could be easily accessed .To minimize the effects of these problems, the researcher has used maximum effort through spending more time and giving more attention.

1.9 Organization of the study

This study is organized in five consequential chapters. The first chapter deals with the introduction part of the paper comprising statement of the problem, objectives of the study and other relevant introductory issues. The second chapter focuses on literature review. An eye bird view on all of the relevant literatures in relation to the topic under discussion was made. The third chapter deals with the research design, approaches used throughout the data collection and analysis process.The fourth chapter presents the overall finding of the study which prevails about the factor affecting the success of the EthERNet project. The last chapter, chapter five encompasses the conclusion and recommendation part of the study. Conclusions are be made from the previous chapter so that we can make some recommendations.

CHAPTER TWO: LITERATURE REVIEW

In this part of the study, theoretical background and empirical review of literatures of different scholars have been reviewed in order to seek what scholars and other authors have written in the area of project management specifically in connection with IT projects success factors. Further, this section deals challenges of Information Technology implementation.

2.1 Theoretical Literature Review

2.1.1. Concepts of project and project management

Kerzner (2013) described that to realize project management; one must start with the definition of a project. A project can be well thought-out to be any sequence or series of activities and tasks that have a specific objective to be completed within certain specifications; have specified scopes, which have defined start and end dates; have funding limits (if applicable); consume human and nonhuman resources (i.e., money, people, equipment) and are multifunctional (i.e., cut across several functional lines). Projects are unique, specific, temporary endeavors undertaken to achieve a desired outcome.

Project is a unique set of co-ordinate activities, with defined starting and finishing points undertaken by individuals or organizations to meet specific objectives with in defined schedule, cost and performance parameter. The word unique points out that every project has its own genuine nature in the sense that there may not be a pre-existing blue print for the project‟s execution and there may not be a need to repeat the project once completed. Its goal characteristics may be well perceive as achieving stated objectives or solve a particular problem, while its temporary nature signifies a discrete, definable commencement and conclusion. Project is series of activities and tasks that have Specific objectives, defined start and end dates, funding limits, and it also has characteristics of multifunctional i.e. cut across several functional lines (Kerzner, 2009).

Pinto and Slevin (1987) define a project as an organization of people dedicated to a specific purpose or objective. Projects generally involve large, expensive, unique, or high risk undertakings which have to be completed by a certain date, for a certain amount of money, within

some expected level of performance. At a minimum, all projects need to have well defined objectives and sufficient resources to carry out all the required tasks.
Probably the simplest definition is found in the Project Management Body of Knowledge (PMBOK) guide of the Project Management Institute (PMI). PMI is the world's largest professional project management association, with over 486,672 members' worldwide as of 2017. In their PMBOK guide, a project is defined as "a temporary endeavor undertaken to create a unique product or service".

Project management is the process by which projects are defined, planned, monitored, controlled and delivered such that the agreed benefits are realized. Projects bring about change and project management is recognized as the most efficient way of managing such change. Project management, on the other hand, involves project planning, monitoring and includes such items as: Project definition of work requirements, definition of quantity and quality of work, description of resources needed, project monitoring, tracking progress, comparing actual outcome to predicted outcome, analyzing impact, making adjustments. Successful project management can then be defined as having achieved the project Objectives (within time, within cost, at the desired performance/technology level keeping the desired quality) while utilizing the assigned resources successfully and efficiently, and accepted by the customer/owners (kernzer, 2013).
According to Project Management Institute(PMI,2013), Project management is the application of knowledge, skills, tools, and techniques to a program in order to meet the program requirements and to obtain benefits and control not available by managing projects individually.
Program management is the co-ordinate management of related projects, which may include related business-as-usual activities that together achieve a beneficial change of a strategic nature for an organization.

2.1.2 What is project success

Success is an interesting word and a word that is so general and wide in nature that it is difficult to define and obtain mutual agreement when asked from different individual.
Judgev and Muller (2005) in their article mentioned that in order to define what success means in the project context is like gaining consensus from a group of people on the definition of "good art."

According to Baccarini (1999), project success requires a combination of project management success and project product success. Project management success is related to

the efficiency of the project management process in terms of cost, time and quality. On the other hand, project product success is related to the effectiveness of the end product. Baccarini (1999) summarize project success as:

Project success = project management success + project product success

In addition, product success is not readily defined, although it is generally seen as being a product that satisfies user requirements.

Generally, the views on project success have evolved over the years from simple definitions that were limited to the implementation phase of the project life cycle to definitions that reflect an appreciation of success over the entire project and product life cycle (Judgev & Muller, 2005).

Many researchers have defined success of projects using different ways. According to Hastie(2006), project success is defined as a measure of the effectiveness of the organizations processes for implementing new Information System projects, up to the point of deployment of the new system to the end user community. This incorporates all the project related activities to ensure: project delivery on time, on budget, of required features and functions and to the requisite quality standards. A standard must be established by which to define and measure project success. Fundamentally, project success is the delivery of the required product, service, or result on time and within budget. To meet these objectives is to deliver a quality project. PMI illustrates project quality through the concept of the triple constraint—project scope, time and cost. Project quality is affected by balancing these three interrelated factors. ―The relationship among these factors is such that if any one of the three factors changes, at least one other factor is likely to be affected (PMBOK, 2004 page no.37).

Figure 2. 1 **Illustrates this constrained relationship, sometimes called the "iron triangle".**

Source: PMBOK, 2004 page37

2.1.2.1 Project success criteria

Success criteria are defined by Muller and Turner (2007) as variables that measure project success. Relevant success criteria have to be identified and then, success factors should be determined in order to increase the chances of project success (Müller, Turner, 2007).Many different approaches of measuring project success can be used. One of the most traditional ones is the iron triangle approach. It affirms that, three main aspects that must be managed together characterize projects: scope, cost and time.PMI (2013. p. 105) defines the scope as "the work performed to deliver a product, service,or result with the specified features and functions".

However, these criteria have received many critics for being inadequate in determining project success, customer opinion and contact was minimal and no long term follow-up effort was established. Over the time, various attempts have been made either to add more dimensions to the basic criteria or to abstract to fewer dimensions (Atkinson, 1999).

In an effort by Kerzner (1998) in his book, In Search of Excellence in Project Management, he identified 5 criteria that can be used to measure project success. The criteria are completed in time, within budget, completed at the desired level of quality, accepted by the customer and resulted in customers allowing the contractor to use them as a reference (Kerzner, 1998: p. 25). Further exploration through the literature reveal that researchers were now extending

the measurement of project success to the after delivery stage in contrast to the early literature where emphasis was given to measurement criteria on the project management stage. One of the researchers, Atkinson (1999) in his study extended the measurement of project success beyond the Triangle; he proposed a new way to consider project success criteria called the Square Route.

The three additional success criteria categories are the information system which looks into the maintainability, reliability, validity and the quality of the information used, benefits as perceived in the organization which can be measured in terms of improved efficiency, effectiveness, increased profits, organizational learning and lastly benefits or effectiveness of the project as perceived by the stakeholder community such as satisfaction of users, social and environmental impact and personal development, to name a few. The elements under these three new criteria categories are not exhaustive and can be added whenever an appropriate and applicable element is identified to be deemed related to the individual project being measured.

The criteria for measuring project success must be established at the beginning of the project, otherwise team members and project leader will find they heading into different directions and the result of the project will not be successfully determined due to difference in perception, emphasis and objectives (Baccarini 1999). Four success dimensions have been classified by Shenhar (1997). The first dimension is the efficiency which is not limited by the dimension of time, cost and quality but can be extended to number of engineering changes prior final design release, production efficiency and yield, efficiency of purchase order and safety measures. Organization need to be caution as not to limit the measurement of success using efficiency measures as these efficiency measures are basically measuring project success in the implementation success and does not represent the total success of the project. The second dimension is the impact on the customer or end user followed by the third dimension which is impact on the organization. Lastly the success of the project need to be measured by the way it helps the organization to move and prepare for the future. Questions like does the project explore new opportunities for further markets, ideas, innovations and products? Does the project management build new skills, develop new technologies and core competencies need to be addressed before determining the success of the project.

2.1.3 ICT in Education Sector

ICT-driven education is electronic mode of knowledge sharing and transmission, which may not necessarily involve physical contact between teacher and student. The concepts "computer-aided teaching" and "computer aided learning" have given birth to computer-aided instruction, which represents a combination of both teaching and learning. Access to instruction through the internet is flexible, ensures broad viability and availability of educational opportunities. It is cost effective system of instruction and learning, materials can be accessed irrespective of time and space (Jegede, 2002). The Information and Communications Technology (ICT) is the technology that has brought excitement to teaching, learning and research. It has become a major educational technology. In its simplest form, it can be used to prepare and reproduce handouts or make presentations of learning materials as slides in lecture rooms. At a higher level, ICT could be used in such instructional modes as e-learning.

Information and communication technology (ICT) has contributed immensely to social and economic improvements, such as higher employment and productivity, increasing access to a higher quality of life(Chandrasekhar ,2001).ICT incorporates electronic technologies and techniques used to manage information and knowledge, including information-handling tools used to produce, store, process, distribute and exchange information(UN ICT TASK FORCE,2003).

The US National Higher Education ICT Initiative (2003) defines ICT knowledge as “the ability to use digital technology, communication tools, and/or networks appropriately to solve information problems in order to function in an information society. This includes the ability to use technology as a tool to research, organize, evaluate, and communicate information and the possession of a fundamental understanding of the ethical/legal issues surrounding the access and use of information.”

According to the United Nations Educational, Scientific and Cultural Organization (UNESCO), ICT “can contribute to achieving universal education worldwide, through the delivery of education and training of teachers, improved professional skills, better conditions for lifelong learning, and the potential to reach people that are outside the formal education process (UNESCO,2011).

According to the Organization for Economic Co-operation and Development (OECD), investments in higher education are essential for economic growth, and the global demand for higher education is predicted to increase vastly from less than 100 million students in 2000 to more than 250 million students in 2025(UNESCO,2011). Institutions have to integrate the innovative tools made available by ICT to increase access to and improve the quality and competitiveness of higher education programs. Without these tools and technologies, individuals and institutions have poorer chances to address 21st-century issues and challenges. Therefore, higher education institutes worldwide are redesigning their educational systems, teaching methods and learning practices(UNESCO,2012).

2.1.4 Benefits of Implementing Ethiopian Education and Research Network (EthERNet) project

According to Felix Bankole and Zelalem Assefa (2017), EthERNet could have a major impact for Ethiopian higher education by facilitating a range of activities. The potential impact for the researcher and educator could include the following in terms of a national network infrastructure and supporting services:

- Creation of a high quality, high bandwidth dedicated national research and education network;
- More effective network links to the public Internet and across national borders to international networks;
- Reliable networks strengthened by contemporary security policies;
- National negotiation for networks and networked resource provision including hardware provision, software licenses and maintenance/support contracts;
- The ability for users to logon at any institute using one set of credentials;
- Single sign-on access to communication, computing, software, data and sensor resources provided by different institutions dependent on managed group access.
- This in turn can then facilitate a wide range of supporting services and initiatives for researchers and educators. These include:
- Provision of on-line collaboration tools for research and education;
- Development of advanced ICT for e-Science and e-Infrastructures that can include computing services, storage and data services, software services and sensor services;

- Creation of science gateways or a “one-stop-shop” to support the needs of Communities of Practice;
- Training and support of networked services and best practices;
- Organization of national end-user conferences and workshops;
- Support for software development as well as the provision of software/hardware testbeds;
- Setting up of e-Learning, open online courses and distance learning programmes;
- Advice on the development of inter-regional international initiatives, project preparation and international funding opportunities.
- By strengthen EthERNet, Ethiopian higher education students, educators, researchers and administrators would be able to access critical resources and to work together locally, nationally and internationally using the networking and computing facilities. For instance:
- Contribute to inter-institutional collaboration, research and human networking.
- Promote joint institutional content development, access to large databases and sharing of research results

2.1.5 Challenges of ICT project Implementation

Implementation of information and communication technology (ICT) services and systems in organisations generally pose a lot of challenges if it is not properly addressed, lead to heavy investment without the corresponding organisational efficiency gains.

At the organisational level, it is widely accepted that the integration of ICT in organisational functions is necessary for increasing efficiency, cost effectiveness, and competitiveness. The tendency unfortunately has been, more often than not, to approach such integration from the technology level, leading to escalating costs without corresponding efficiency gains.

Tusubira and Muliral(2004) , they highlights in their paper that the common challenges of ICT based on their working experience in various organization in Uganda ,according to them the followings are common challenges of ICT implementation:

- lack of awareness
- lack of top level commitment
- Making ICT responsive to the organisational vision and mission
- Developing a systemic method of implementation

- Creating Ownership
- Sustainability
- Developing the Organisational Information Policy

2.2 EMPERICAL LITERATURE REVIEW

2.2.1 Project success factors

Success factors can be perceived as main variables that contribute to projects'success (Dvir, 1998), as levers that can be operated by project managers to increase chances of obtaining the desired outcomes (Westerveld, 2003). A combination of factors determine the success or failure of a project and influencing these factors at the right time makes success more probable (Savolainen, 2012).

Developing or identification of success factors has dominated the field of project management from 1980s to 2000. Many researchers have tried to a certain extent to identify success factor for project management. These includes Kerzner (1987), Pinto and Slevin (1987), Pinto, Slevin and Dennis (1989), Clarke (1999), Cooke Davis (2002) and Muller (2003). The following paragraphs are dedicated in reviewing the main contributors in setting the success factors of project management.

Pinto's model of ten critical success factors of the project management profile

Pinto and others have published a number of articles on critical success factors and has established a widely known accepted 10 critical success factors. Pinto used a fifty-item instrument called Project management Profile (P.I.P) to measure a project's score on each of the ten factors in comparison to over 400 projects studied. The 10 critical success factors identified by Pinto (1986) are listed as follows:

1) Project mission – initial clarity of goals and general direction

2) Top management support – willingness of top management to provide the necessary resources and authority of power for project success

3) Project schedule/plans – detailed specification of the individual action steps required for project management

4) Client consultation – communication and consultation with, and active listening to all affected parties

5) Personnel – recruitment, selection and training of the necessary personnel for the project team

6) Technical tasks – availability of the required technology and expertise to accomplish the specific technical action steps

7) Client acceptance – the act of "selling" the final project to its intended users

8) Monitoring and feedback – timely provision of comprehensive control information at each stage in the implementation process

9) Communication – provision of an appropriate network and necessary data to all key actors in the project management

10) Trouble shooting – ability to handle unexpected crises and deviations from plan

The first seven factors can be laid out on a sequential critical path while the balance three factors which are monitoring and feedback, communication and trouble shooting must be necessarily present at each point in the implementation process. As the project move along its life cycle, different factors are emphasized. The first three factors (mission, top management support and schedule) are related to the early "planning phase" of project management whereas the other seven are concerned with the actual execution stage of the project life cycle. As both strategic and tactics are essential for successful project management, their importance shifts as the projects moves through its life cycle. Strategic issues are most important at the beginning and tactical issues gain in importance toward the end. It is vital that a successful project manager/leader must be able to make transition between strategic and tactical considerations as the project moves forward.

Kerzner's critical success factors

Kerzner (1987) in his study define critical success factors are elements which must exist within the organization in order to create an environment where projects may be managed with excellence on a consistent basis. They are the few key areas where "things must go right" for a particular business to flourish.The factors are listed as follows:

1. **Corporate understanding of project management**

In order for a successful project management , corporate understanding of the project management at the employee/functional level, project management level and executive level. A good corporate understanding will create a corporate culture where project management is no longer viewed as either a threat to established authority or a cause for unwanted change.

2. **Executive commitment**

Project management is unlikely to succeed unless there is any visible support and commitment by executive management. This support and commitment can be described in two subtopics; project sponsorship and life-cycle management. The role of the sponsor is to manage interference that exist for the project manager besides continuously remind project team that only performance at the highest standards of excellence are acceptable. It is important that company goals, objectives and values be well understood by all members of the project team throughout the life-cycle of the project. Ongoing and positive executive involvement, in a leadership capacity will reflect executive management's commitment to project management.

3. **Organizational adaptability**

Organizational adaptability refers to the organization's ability to respond quickly and effectively to changes in the marketplace. Two critical factors involving organizational adaptability were found in organizations committed to excellence; informal project management and a simple but lean structure. The decision to go for either formal or informal project management and implementation depends on the scope and size of the project, the cost of the project, the availability of experienced personnel for the project and also the maturity of the concept of utilizing project in an organization. Staffing for projects was done in a manner to achieve a blend of experience, technical expertise and training. Proper

selection of resources will insure that technical skills are optimally utilized with a minimum of overhead. A project team where its structure is simple and lean enable better control, communication and in budget. With this lean approach, the project manager must be experienced and have a qualified team. There must be a clear definition of responsibility and authority for individual members of the team and the project manager must be able fill the roles of facilitator, coordinator, leader, organizer, planner, delegator and administrator in order for the project to be implemented successfully.

4. **Project Manager Selection Criteria**

Four criteria that are normally used to select project managers are whether they were results-oriented, possessed strong interpersonal skills, their depth of understanding of the organization and lastly their commitment to corporate values.

5. **Leadership style**

Strong leadership style by the project manager is necessary for the successful implementation of projects. Normally the project manager has a great deal of responsibility but does not have the commensurate authority as a line manager whereas the line manager has a great deal of authority but only limited project responsibility. Considering this fact, it is therefore important for a project manager to maintain a leadership style that adapts to each employee assigned to the project. This is further complicated by the fact that the project's life cycle may be so short that the project manager does not have sufficient time to get to know the people.

6. **Commitment to planning and control**

Well-managed projects are committed to planning. For example if the output of a project is to contain quality, then this quality must be properly planned for in the early states of a project. When detailed planning is being done, it must be tracked or follow-up and re-planning must be done if the initial plan does not work before it is too late to do so. It is shown that personnel factor especially the project manager competence and leadership style is one of the crucial factor in project success implementation. This is true as project in itself has no essence unless it is managed by a group of people with the necessary skills, experience and qualification.

Belassi and Bukel's critical success factor

Belassi and Tukel (1996) have grouped critical success factors in projects into four areas and further explain the interaction between them. The four groups were factors related to the project, factors related to the project manager and the team members, factors related to the organization and lastly factors related to the external environment. Belassi and Tukel perform 2 surveys; firstly they identify the 5 most common success factors from the literature and asked the respondent to list any other critical factor specific to their projects. From the first survey, they obtained 91 responses in which 21% of the respondents are project managers from manufacturing sector. The project managers in manufacturing ranked the most critical factor for project success as availability of resources, followed by top management support, the third most important factor was preliminary estimates, followed by project manager performance and client consultation.

In this survey, it also shown that in respect to the criteria used to measure success (cost, time, quality and client satisfaction), the organizational structure (pure, functional or matrix) and project size (more and less than 100 activities), the factors related to the organization which

were availability of resources and top management support are still the dominant factors on the list. From the second survey done using a questionnaire which targeted the project managers, out of the 57 responses that they obtained, 40.7% respondents are from manufacturing which formed the largest response group. The respondents from manufacturing sector indicated that factor related to the organization is most critical. Further to that the project managers from manufacturing rank top management support, coordination and competence of project manager as the most important factors for project success, in fact these three factors were ranked equally important followed by commitment, technical background and communication of project members as the next 3 important factors.

2.2.2 ICT Project Success factors

IT Project Management combines traditional Project Management with Software Engineering Management Information Systems to reach higher levels of success on IT projects.

Gichoya (2005) outlines factors for success as those occurrences whose presence or absence determines the success of an ICT project.They can be drivers or enablers (Moran 1998). Their absence can cause failure and their presence can cause success.Drivers are the factors that

encourage or reinforce the successful implementation of ICT projects. Some of these drivers are vision and strategy, external pressure and donor support, rising consumer expectations, technological change, modernization and globalization. Enablers are the active elements present in society, which help overcome the potential barriers. Some of these include effective project coordination, change management and good practice.

Scott (2005) examined the role of project managers in the IT industry and stated that IT projects need the strategic alignment of business and technology in organizations to take full advantage of the power of technology. The business objectives of a project provide the starting point for defining the scope of the project. Scott (2005) emphasized that project management practices and methodologies need flexibility to meet changing technology and business demand.

One of the first surveys about IT Project Success was the CHAOS study (published in 1995) by the Standish Group reporting that 31 % of IT projects were cancelled before completion, 53 % of them were completed over budget / schedule (called challenged projects), and did not meet all of the project requirements. Only 16 % of IT projects were successful. This study is an important reference for most of the described works, as well as for the present article. An often-cited summary of the CHAOS top-10 factors (The Standish Group, 2001) in their annual chaos report have listed project success factors to be as follows (in order of importance);User Involvement, Executive (Top Management) Support, Clear Business Objectives, Emotional Maturity, Optimization, Agile Process, Project Management Expertise, Skilled Resources, Execution and finally Tools and Infrastructure.

More recently, the Standish Group International(2010) again in their annual report listed the updated project success factors ,the student researcher select these factors because they are much more applicable for this study. The factors (In order of importance) are as follows: Executive Support,User Involvement, Experienced Project Manager ,Clear Business Objects ,Minimized Scope ,Standard Software Infrastructure ,Firm Basic Requirements ,Formal Methodology ,Reliable Estimates.

1. **Executive Support**

Since this is the single most important for the project success, its absence is the main reason why project fail. Changes in executive leadership, changing political scenes, changing business priorities can easily result in loss of that support. Because of this fragility, the

project manager must be held to the standard and practices that preserve rather than alienate the executive sponsor .Those standards and practice will be a part of communications management program that makes up project methodology. Executive management must have a stake in outcome of a project. A well-devised project plan, along with project team commitment, will go a long way in gaining executive management buy-in. And if the executives becomes the leading spokesperson of a project, it is a sure sign of management buy-in. The executives should be visionary ,setting the agenda, arranging funding , articulate objectives, and also be the champions and minesweeper ,securing the necessary resource and taking total ownership of a project.

2. User Involvement

Lack of user involvement traditionally has been the number one reason for project failure. Conversely, the number one contributor to project success has been user involvement. Even when delivered on time and on budget, a project can fail if it does not meet user needs or expectations. However, at 2010 chaos report it has moved to the number two position. It is not that user involvement is less important, but it is just that IT professionals have centered in on this and, in effect, solved this major problem. The best way to assure user help and support when it is needed is to keep the user meaningfully involved throughout its life cycle.

3. Experienced project manager

Business and technical knowledge, judgement, negotiation, organization, and good written and oral communication skills are desirable traits for a project manager. The ability to communicate with all the stakeholders and the technical team is necessary. Additionally, planning, tracking activities, tasks, and changes or replanning to arrive at a goal are other skills a project manager should maintain. A project manager should decide what features and functions are part of the project, orchestrate all resources, focus on the goal and minimize diversions, and establish accountability, responsibility, and authenticity. A project manager should not be the executive sponsor, user or functional representative, and should not overpromise or be a control freak.

4. Clear Business Objectives

Project management methodology must have a formal process for establishing clear business objectives. If you do not know where you are going, how will you know what to do and how will you know when you get there? Projects that start out without having this information are in trouble unless the methodology has a way of compensating for that lack of information

.Traditionally project management approaches do not have a way of compensating; the newer adaptive and iterative approaches do. Since changes is almost certain, the project management methodology must have a way of maintain the objectives as they change and a way of adapting the project plan to those changes. Everyone associated with a project must share the same vision. The vision must be clear, concise, and comprehensible. The goal of the project must be known and enthusiastically supported by all. And goals must have measurable success factors. The project business objectives must map to the corporate vision. This ensures that those associated with a project know and understand the objectives, where they fit in, and how the project goals contribute to the corporate vision.

5. **Minimized Scope**

The trade-off here is that longer projects will incur more changes and risk and less so for shorter projects. Change in scope brings about a change in the project plan and the increased risk that work completed earlier may no longer be of value. That means wasted dollars and wasted time. A large project can be decomposed into several interdependent smaller projects. Each smaller project should be justified based on the specific deliverables and business outcomes that will be produced. The extent to which the project management methodology consider this approach and includes process for decomposition is a measure of its quality and maturity.

Major milestones in a project from the boundaries from one phase to the next. Adding some smaller milestones and monitoring their attainment is one of the keys to project success. The five key elements to effectively using project milestones are planning, top-down design, time boxing, tools, and management by objectives/accountability.

6. **Standard Software Infrastructure**

This factor speaks to the stability of the infrastructure over which your project work will be done .If that infrastructure is in flux, your project plan is at risk for radical change. That risk opens the possibility of missed deadlines, use of the wrong human resource, team members with the wrong skills, inability to meet the client's requirements, and a host of related impacts.

It is vital to use a language that is understood by all parties involved in a project. Infrastructure is defined as the underlying foundation, and that includes ensuring a standard

business infrastructure throughout the enterprise environment. A standard technology infrastructure can facilitate the placement of new kinds of technology to support business initiatives .Selecting a robust and scalable infrastructure will enable business to profit and expand by harnessing the capabilities and promise of truly global electronic commerce.

7. Firm Basic Requirements

Much of the discussion surrounding clear business objectives applies here. By way of analogy, you cannot start out on a journey unless you have some idea of where you intended to go. The better you can define that journey the more effective will be your initial choices of direction. The better you understand the client's basic requirements, the better your plan will be for delivering an effective solution to meet all of their requirements.

Requirements management is the ongoing process of identifying, documenting, communication, tracking, and managing project requirements as well as changes to those requirements. The earlier an error is detected, the less costly it is to fix. A concise definition of the project vision should be written in business terms. Buy-in from the user and executives are paramount to project viability. Continuous reevaluation must occur. Identify all key stakeholders and include them in the requirements definition .Identify the documents all risks and formulate a plan to minimize them. Develop a clear statement of the business case. Define the project metrics, measurements and milestones.

8. Formal Methodology

Project management methodologies that can be repeated are valuable to the organization .Repeatability creates standards ,best practices ,skill developments, and a host of other benefits to the organization .Project management methodologies that are adaptable rather than rigid are valuable to the organization as well. The extent to which a project management methodology is standardize, documented, accepted and practiced, integrated in to the business equation, and improved upon is a measure of its quality and maturity. The project management office (PMO) is a part of the infrastructure that will help an organization align business and technical goals and increases the odds of project execution in organizations. It is the dedicated section of the organization that focuses on various aspects of project management and methodology .PMOs help to gain better control over processes and project outcomes, being consistency to their implementations, standardize operations, control resource allocation, and handles customer interfacing, PMO staff members have project management experience and excellent communication skills.

9. Reliable estimate

Historical estimate versus actual costs and durations are best tools for producing new estimates of cost and time. The availability and maintenance of this historical information is a sign of the maturity of the project management process.

Reliable estimates can only come from honest and frank assessments. It is important to create realistic written specifications, prioritized needs, and work toward smaller milestones at frequent intervals. Managing change is another requirement in setting realistic expectations. A misalignment between expectations and deliverables often occurs if change is not managed.

2.3 Summary of reviewed literature

Project success has been defined in many ways to include a large variety of criteria.

Many different approaches of measuring project success can be used. One of the most traditional ones is the iron triangle(Time, scope, budget) approach.However, these criteria have received many critics for being inadequate in determining project success that is stakeholders view is not included.

However, in the simplest terms, project success can be thought of as incorporating four basic things. A project is generally considered to be successfully implemented if it: comes in on schedule (time criterion); comes in on-budget (monetary criterion); achieves basically all the goals set for it (effectiveness criterion) and is accepted and used by the stakeholders for whom the project is intended (client satisfaction).

Whatever various scholars and researchers have come up with multiple factors affecting project success, no two researches have produced the same project success factors and even where the same researcher conducted the exact same study in different time periods they have consistently come up with different project success factors. So project success factors are different depending on project size, project type and the situation in which the project is implemented.This goes to show the complexity of the subject and it will thus be hard for the

researcher to claim that the conclusions drawn by this study shall be exhaustive. This research study try to collect the views of all project stakeholders from the vender to the project product end users in order to identify the overall perception of project staff on factors affecting success of EthERNet project within their organisation.

2.4 Conceptual frame work

A conceptual framework is a set of broad ideas and principles taken from relevant fields of enquiry and used to structure a subsequent presentation (Kombo and Tromp, 2009). After an in-depth review of theoretical and empirical literatures which provided different potential success criteria and success measures for projects management is conducted in the preceding parts of the chapter.

Due to its comprehensive, detailed descriptions, and because much of the other research was based upon it , The student researcher has reached up on a conclusion that the Nine most significant success factors in determining project success identified by Standish Group International (2010) have been chosen for this study. Based on these identified variables, a questionnaire is developed and distributed to the project stakeholders(owners and vender) so as to identify the most important factors which influence for the success of EthERNet project and come up with possible solutions/recommendations which are use full for other projects undertake by Ministry of Education .

CHAPTER THREE: RESEARCH DESIGN AND METHOGOLOGY

For this thesis research methodology, the research methods, approaches, designs, sampling techniques and sample size, data collection methods, and data analysis methods are described hereunder in detail one by one.

3.1 Research Design and Approach

A research design is a frame work or blue print for conducting any research project. It details the procedures necessary for obtaining the information or solving research problems (Zikmund,2002).

This research is categorized as explanatory type. It will be explanatory because it tries to explain the factors or variables affecting the success of EthERNet project in Ministry of Education. As the name suggests, this design refers to a set of methods and procedures that describe variables.

Depending on the type of data that are used in the research, two general research approaches are identified, qualitative or quantitative. In this study both types of dada those can and cannot be quantified are used. The quantifiable data are gathered by the closed ended questions of the questionnaire which were designed to keep the respondents in scope. There

were also open ended questions, providing unquantifiable data, which were designed to provide respondents with the freedom of expressing what they believe important for the study. This leads for the study to use a mixed research approach which both qualitative and quantitative research methods are applied.

3.2 Target population and Sampling techniques

3.2.1. Target population

The population of the study was comprises the stake holders of EthERNet projects such as owners (MOE, The six public universities and technology institutes) found in Addis Ababa and venders(ZTE) who are participated in the implementation process of EthERNet project was taken for the study. The questionnaire distributed for project managers ,project coordinators ,network engineers, system administrators and team leaders who were working under the project implementation departments of the above mentioned stakeholders.

3.2.2. Sampling method

Census sampling technique is used to select the respondents under owners (MOE, The six public universities and technology institutes in Addis Ababa) and vender (ZTE). According to Walliman (2005), purposive sampling is a useful sampling method which allows a researcher to get information from a sample of the population that one thinks knows most about the subject matter.

3.2.3. Sample size

In the case of this research population, it does not mean that all members (employees) of project staff are possible respondents for the questionnaire. Rather the questionnaire were distributed to system administrators who were located under contract administration departments of each project stakeholders (vender and owner) who is working under EthERNet project.There are 10 network administrator , 4 system admin , 4 computer engineer, two IT manager ,one project coordinator and one project manager. Will be respondent under Mnistry of Education of information technology department who is acting as project owner. And 8 network engineers , 5 system admin ,1 computer engineer and one project manager were involved under contract administration department of Vender. The researcher believed that these are the only respondents who know about factors affecting the success of EthERNet project as they were involved in the implemetation of the project and

decided to distribute the questionnaire to all of these system engineers and network administrators. Therefore, the questionnaire was distributed for a total of 42 respondents who know the area or subject matter very well.

3.3 Method of data collection

The data is gathered in two ways:

1. **Questionnaire:** Closed ended and open ended questionnaires is prepared and distributed for all project participant respondents (Questionnaires is distributed to venders and owner of EthERNet project).

2. Interviews: The structured interview is prepared especially for project managers, project coordinator, Network administrator, Network engineer the researcher hoped that, these sources are enough and relevant to investigate the most common and major factors which affect the success of EthERNet project.

3.4 Methods of data Analysis

The analysis part was combined all groups of respondents (Vender and owners) in order to obtain significant results. The data was analyzed by calculating the relative important index(RII) model to rank the hypothesized factors based on their importance which was derived from the views of the respondents of the two groups. The spearman rank correlation coefficient is used to test the hypothesis of this research (whether there is significant agreement between the views of respondents from different groups to rank the success factors). The RII method was used to determine the relative importance of the various success factors of EthERNet project.

RIIs for each factor is calculated as shown below:

$$RII = \frac{\Sigma w}{(A*N)}$$

Where:

RII = relative importance index

W = weighting given to each factor by respondents (ranging from 1 to 5)

A = highest weight (i.e., 5 in this case); and

N = total number of respondents.

The RII values have a range of 0 to 1 (0 not inclusive); the higher the RII, the more important the factor will be. The RIIs will be ranked, and the results will be shown by using tables and/or graphs.

The Spearman's Correlation was used to compare the views of all respondents regarding about how they did rank the hypothesized factors to contribute for the success of EthERNet project (to make a comparative analysis between owners and vender). Correlation is a relationship measure among different parties or factors and the strength and direction of the relationship. In this research spearman's correlation was used to show the degree of agreement between the different paries of project stakeholders. The correlation coefficient varies between +1 and -1, where +1 implies a perfect positive relationship (significant agreement), while -1 result from a perfect negative relationship (disagreement).In order to decide whether to accept or reject the null hypothesis, the level of significance 95% (P = 0.05) was used. This allows to state whether or not there is "agreement" between respondents response.

If the calculated value of ρ is less than the critical value, H0 is failed to be rejected, i.e. there is no evidence of a statistically significant agreement between the groups. If the calculated value of ρ is greater than the critical value, H0 is rejected, i.e. there is evidence of a statistically significant agreement between the two groups.

Spearman rank correlation coefficient is used to determine whether there is evidence of a linear relationship between two ordinal variables. The sample spearman correlation coefficient is denoted by r_s and is given by the formula below: (Saleh; 2001)

$$r_s = 1 - \frac{6 \Sigma d^2}{n (n^2 - 1)}$$

Where:

rs = Spearman's rank correlation coefficient

d = the difference in ranking between the usage and effectiveness of factors

n = the number of factors used to correlate

The Statistical Analysis Software (SAS) computer software was used specifically for the purpose of qualitative data and presenting it inform of table,figures and charts.

3.5 Ethical issues

Ethics is one of the major considerations in research. The researcher of this study is also subject to the following ethical considerations.The research work was started after getting the willingness of the stated organization.Respondents clearly communicated about the objective of the research before they are asked to give their answer.There was no any physical or psychological damage to them because of the research.Respondents was not asked about their name, race, religion, etc.

CHAPTER FOUR: RESULTS AND DISCUSSIONS

In this section, the researchers collected data were discussed, analysed and presented. To collect important information the investigator were distributed 42_questionnaires for selected respondents from this 39 were returned and analysed with a response rate of 92.8%.

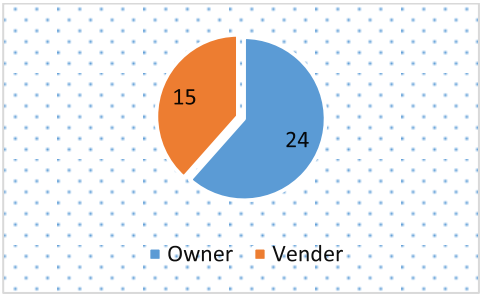
4.1 Population characteristics

This part is mainly designed to provide general information about the respondents in terms of major type of work involved, and experiences of respondents.

4.1.1 Types of respondent's organization

In this study, 61.5 % (24) owners and 38.5% (15) Vender are participated in the questionnaire as shown at Fig (4.1). The general response rate for owners and vender was 92.8% and the total number of respondents for the study was 42.

Figure 4. 1**: Types of Respondents Organization**



4.1.2 Experience of Respondents

Table 4. 1: **Experience of Respondents**

		Owner	Vender
Experience	Under 3yrs	(25%)6	(13.3%)2
	4 - 10 yrs.	(62.5%)15	(53.3%)8
	11 -20 yrs.	(12.5%)3	(33.3%)5
	21 – 30 Yrs.	0	0
	Above 30 Yrs.	0	0
Total	100%	(100%)24	(100%)15

In the above table 4.1 shown that 25% of owner group respondents work experience is under three years where as 13.3% of vender group respondent work experience is very low that is under 3 years. And 62.5 % of owner group respondent work experience is 4 -10 years, it is obvious that much of project participate better experience which may maximize the performance of the project. As we can see from the table 53.3% of vender group respondent project member also in the same range which is 4 -10 years' experience.

4.1.3 Profession of respondents

Table 4. 2: **Profession of the respondents**

		Owner	Vender	Total
Profession	Network admin	10	8	18
	Database admin	0	0	0
	System admin	4	5	9
	Software programmer	0	0	0
	Computer engineer	4	1	5
	IT manager	4	0	4
	Project manager	2	1	3
Total		24	15	39

4.1.4 Educational status of respondents

Table 4. 3: **Educational status of the respondents**

		Owner	Vender	Total
Educational Status	degree	15	10	25
	2nd degree	8	5	13

	Above 2nd degree	1	0	1
Total		24	15	39

4.2. Factors contributed for the success of EthERNet project at MOE

This part of the paper consists of results and discussion of factors that contribute for the success of EthERNet project. The factors are discussed into two groups , as success factors from the views of owners and success factors from the views of Venders . The ranking of factors is done based on the level of importance of factors that affect the success of the project.

4.2.1. Ranking of Success factor of EthERNet project by owner view.

In this sub-section, the analysis of questions which are believed to evaluate the presence of success factors in EthERNet project were presented. The questions were categorized under Standish Group International (2010) success factors. The data collected for all the nine variables are analyzed separately at first and finally analyzed jointly to implicate which factors are presented and which are the top factors according to their importance in the project.

TAble 4. 4: **Ranking of success factor according to owners view**

Success Factors	Average RII Values	Rank
User Involvement	0.88	1
Top Management Support	0.80	2
Project Management Experience	0.76	3
Clear bussiness objectives	0.75	4
Minimized projcet scope	0.74	5
Standard Infrastructure	0.68	6
Firm basic requirements	0.68	7
Formal Methodology	0.63	8
Reliable estimates	0.62	9

Source: field survey, 2018

Table 4.4, shows that the respondents from the owners group ranked "User Involvement" in the first position with the relative importance index value of (RII=0.88) which indicates the lack of user involvement traditionally has been the number one reason for project failure. Conversely, the number one contributor to project success has been user involvement. Even when delivered on time and on budget, a project can fail if it does not meet user needs or expectations. This result Actually is not consistent with The Standish group International (2010) as their report revealed that, the top factor for project success is Top Managemet Involvemet .

The second factor ranked by respondents of owners (MOE) is "Top Management Involvement" with the relative importance index value of (RII=0.80). This may traced to the importance of Top management support .Eight items those are believed to assess the top managemet involvement were presented to the respondents on which they expressed their level of agreement. The analyzed response indicated that the steering committee who is typically provides support, guidance and oversight of progress of the project is not organized from different discipline & different stakeholder which may lead to the lack of consideration of specific area in the project. This is indicated by many respondents disagrement specific to this question.This finding is consistent with 10 critical success factors identified by Pinto's(1986) ,in that he put top management support in the second position.

The third factor contributing to this project is “Experienced project manager” even if many of the respondent believes that the PM has adequate training, they are not sure that the PM has the ability of communication with different stakeholders as well as ability to motivate team members to build team spirit. The data indicates most of the respondents are not sure about project manager communication skill. Specifically, most of the respondent agree that project managers lack the motivation to turn the project in to a success.

The fourth factor which contribute for success of EthERNet project according to owner respondents’ is “Clear bussiness Objectives” with the relative important index value of (RII=0.75). Many of respondent agree that there is clear objective of the project and it is documented and signed off by top management.

This finding is consistent with Standish Group International (2010). But the problem here is the objectives of the project is known by senior management only. Every project members especially project leader who are in different position should clearly understand the project objectives otherwise the probability of project failure will be high.

“Project minimized scope” is ranked fifth with the relative importance index value of (RII=0.74), according to the views of owner respondents. All respondents agree that the EthERNet project implement phase by phase approach. If a project is longer, it will incur more changes and more risks so it is advisable to follow phase by phase approach to lead a project to success. This result is consistent with The Standish Group International (2010), in previous chapter on literature review it is explained that the extent to which the project management methodology consider phase by phase approach and includes process for decomposition is a measure of its quality and maturity.

The student researcher finding shows that 41% of the respondents said when project scope was changed accordingly there was no replanning and documentation. Change in scope brings about a change in the project plan and the increased risk that work completed earlier may no longer be of value.

“standard infrastructure” is ranked sixth with the relative importance index value of (RII=0.68) equally as important as “firm basic requirement” which is ranked seventh in the views of owner respondents.To run a huge project like EthERNet project which require reliable broadband internet, but difficult at this time in our country. Even if internet accessibility is increasing all over the country, still the quality is poor. As the student researcher finding shows that owner respondents don’t agree that the EthERNet project works over the stable infrastructure.

The seventh factor for the success of project is “Formal methodology” with the relative important index value of (RII=0.63).According to owner respondent this project didn’t applied modern project management methodology, just they used the traditional method.
The ninth factor for the success of EthERNet project is “Reliable estimation of projects” with the relative importance index value of (RII=0.62). It can be considered as main factor for delay basically because of fluctuation in price of raw materials which will happen due to exchange rate fluctuation. If exchange rate fluctuation is common , mismatch between the estimated and the actual implementation cost must be common. If the estimated cost is below the actual cost necessary to complete the project, it will be difficult to manage.And also it may result with delay in the delivery of the project.At this point project change management play a great role.
Therefore as we can understand from the views of owners, user involvement is a major factor which affect the EthERNet project success.According to these respondents, there are different factors in the above case study and the factors are different in terms of their importance . As it is indicated above, the researcher tried to identify and rank them which is assumed to represent the views of owners of the EthERNet project understudied.

4.2.2. Ranking success factor of EthERNet project by vender views

TAble 4. 5: Ranking of the success factor according to vender view

Success Factors	Average RII Values	Rank
Top Management Support	0.74	1
User Involvement	0.73	2
Project Management Experienc	0.7	3
Clear bussiness objectives	0.68	4
Minimized projcet scope	0.66	5
Standard Infrastructure	0.62	6
Firm basic requirements	0.59	7
Formal Methodology	0.59	7
Reliable estimates	0.58	8

Source: field survey, 2018

Table 4.5, prevails about the views of respondents from the vender group who were involved on EthERNet project under studied to rank factors according to their importance to the success of the project.

According to respondents from the vender group, "top management support" is ranked first with the relative importance index value of (RII = 0.74), Project management is unlikely to succeed unless there is any visible support and commitment by executive management. Here we can observe the difference between the views of Owners and Vender in this particular factor of success. The Owner respondents ranked "Top management"second but the Vender ranked it first. The Standish Group International (2010), ranked it first which support the views of vender respondents.

According to vender views the second important factor for the success is User Involvements with the relative importance index value of (RII =0.73).As the finding shows that some of the respondent believes that EthERNet project end users were not involved at all stages of the project.

"Experienced project manager" is ranked third with relative importance index of (RII=0.71).As we can observe from the data that even if many respondent agree that the project manager was adequately trained to successfully deliver EthERNet project, some of the respondent are not sure that the project manager has the communication skill. Whereas this skill is very important to build the team spirit and also to manage the project stake holder properly.

“Clear Business Objectives” and “Project Scope” are ranked fourth and fifth respectively by vender group respondents.As it is stated in the literature review above the project goal not only clearly known by all stakeholder but also should be supported by all project participants. “Standard Infrastructure” ranked sixth by vender group of respondents. Almost all respondents agree that the infrastructure scalable and robust. On the top of that more than half of the same respondent said the EthERNet project is not working over the stable infrastructure. In addition to that the same respondent believes that the EthERNet project is not working over stable internet. As we know our country is expanding internet infrastructure to make accessible all over the country but the quality wise still is not satisfactory as a result obviously it is difficult to run such a big information technology project.

”Firm basic requirements” and “Formal Methodology” ranked seventh and eighth with the same relative importance index value of (RII=0.59) which implies that both factors are equally important for the success of this project. According to vender group views “Reliable Cost Estimates” ranked in the last position with relative importance index value of (RII=0.58).

4.3 Comparative Analysis

This section of the study aims to see the level of agreement (significant relationship) between the two project implementer parties; Owner versus Vender in terms of their view to rank the factors which can influence the success of the project understudied.In this research the Spearman’s correlation is used. Correlation is a relationship measure among different parties or factors and the strength and direction of the relationship. For this research it is used to show the degree of agreement between the different parties.

The Alternative Hypothesis (H_A) is:H_A is there is no agreement in the ranking of factors contributing for project success between two groups of respondents (owner versus vender) .

The Null Hypothesis (H_O) is:Ho is there is agreement in the ranking of factors contributing for project success between two groups of respondents (owner versus vender) .

In order to decide whether to accept or reject the null hypothesis, the level of significance 95% (P = 0.05) is used. This allows to state whether or not there is "agreement" between respondents response.

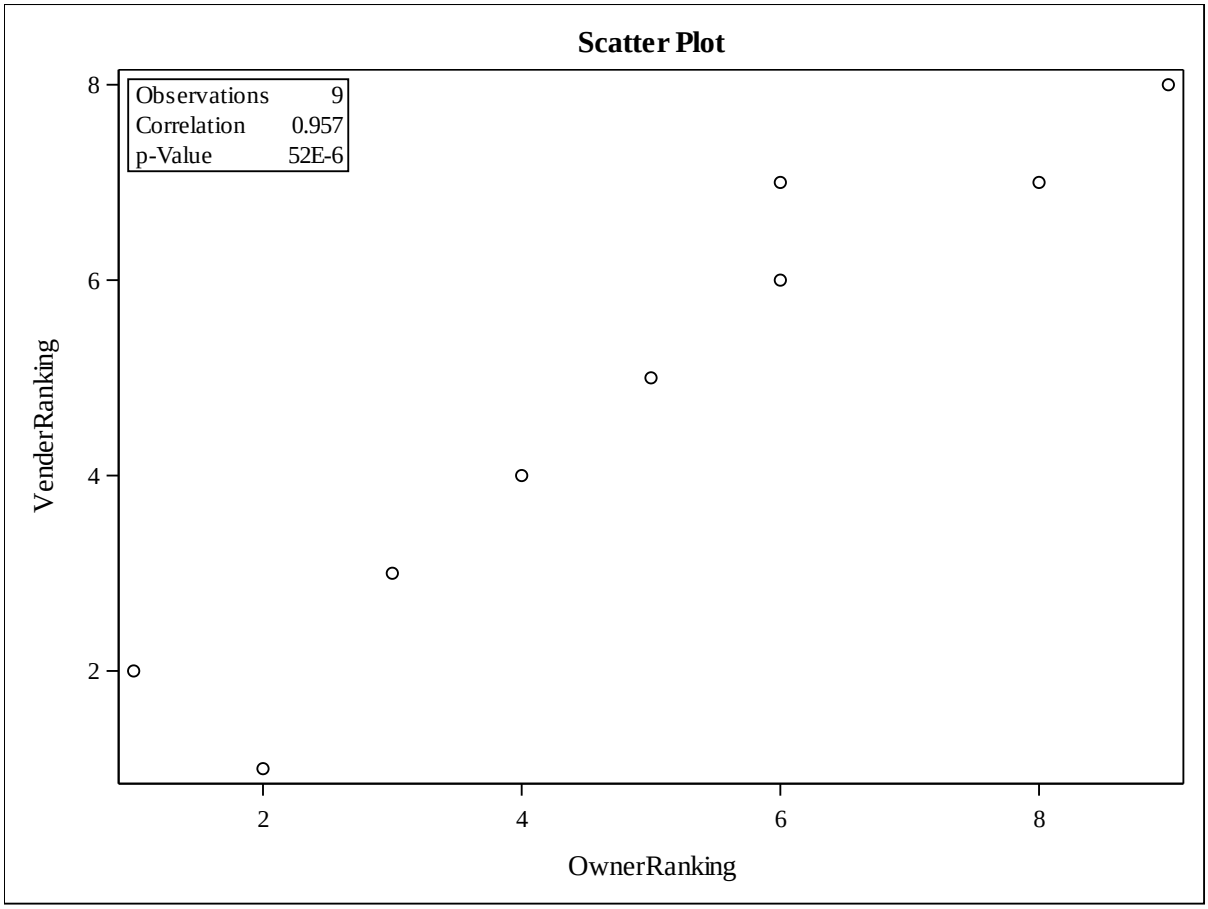
Table 4. 6: **Correlation test of the influencing success factors among owner and owner**

Spearman Correlation Coefficients, N = 9 Prob > |r| under H0: Rho=0		
	Owner Ranking	**Vender Ranking**
Owner Ranking	1.00000	0.97059 <.0001
Vender Ranking	0.97059 <.0001	1.00000

The table 4.6 above show that P value 0.0001 which is less than the significant level 0.05; it means that there is strong agreement in ranking success factor between owner group respondent and vender group respondent. Since the correlation coefficient p=0.0001 is less than 0.05 % of significant level automatically the null hypothesis is accepted.

Therefore we can conclude that HA hypothesis is rejected that means there is almost perfect relationship is existed in ranking of factor affecting the success of EthERNet project between owner group and vender group respondents.

Figure 4. 2: **the graphical presentation influencing success factors**



The above figure 4.1 shows both owner group respondent and vender group respondent success factor ranking increases almost in similarly way.

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

In this final chapter, a conclusion of the research findings that has been discussed and analyzed indetail in chapter four is drawn shortly. Furthermore, possible recommendations based on the findings have been provided and also future research gaps are indicated hereunder.

5.1. Conclusions

From the results of the analysis of secondary data and respondents' responses the following conclusions are drawn.

- The study concluded that project success factors such as: Top management support, user involvement, Experienced project manager, Clear business objectives, project scope, standard infrastructure ,firm basic requirements, formal methodology and reliable cost estimation are found to be critical success factors contributing to the EthERNet project success. That means all the variables tested are critical factors which strongly influence the success of the project.
- The spearman correlational analysis concluded that there is a strong correlation on the responses of owner and vender respondents.
- The researcher found one more factor from respondent which affect the success of project was stakeholder management, it was one factor to mismanage project implementation process.
- The respondents from two group of project participants they have disclosed their view for the importance of project risk identifications. Based on their view the researcher identified that there was a serious problem of project risk identification and documentation, this is mainly a problem of the vender.

5.2 Recommendations

Based on the above finding and conclusion the researcher forwarded the following recommendations.

- Stakeholder management should be given prime attention in order to strengthen the project implement capacity to achieve the project objectives timely.As the project initiator ministry communication and information technology(MCIT) and as project owner ministry of education(MOE) has to participate relevant stakeholders such as: The selected universities to implement this project and Ethotelecom. MCIT should give emphasis on improving contract

administration by developing skilled manpower and project lesson development activities. Success factors that have significant effect on the overall success of the project should be managed selectively according to their effects.

- Especially project implementer (vender) should clearly identify project risk and discuss with the project owner and accept if any additional risk is identified by them.
- The three top factors such as top management support, user involvement and experienced project manager are very much important for the success of a project so especially the project owner should give serious attention in order to maximize project performance.
- Contract administration constraints such as implementing strong monitoring and control practices, technology transfer and keeping quality according to agreements must be solved in phase II of the same project.
- **Recommendation to Further studies:**

➢ This study was limited to project success at operational level (implementation aspects) only. Therefore, further studies are recommended to study the EthERNet project success at tactical perspectives i.e. project Effectiveness, overall Impacts and relevance of the project to test whether the project contributes to easy data sharing and big data storage and above all reliable and fast data communication between universities and research institutes.

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APPENDICES

APPENDIX A

ST. MARY'S UNIVERSITY

SCHOOL OF GRADUATE STUDIES

This questionnaire is prepared to conduct a study in the partial fulfillment of a Master of Arts in Project Management (MA) program entitled with "Assessment on challenges of EtERNet project implementation: the case of ministry of education " you are kindly requested to give the necessary information for the research questions.

There is no need to write your name and address and the information that you provide will be kept confidential. The accuracy, honesty, and fairness of your response will have a great impact on the outcome of the research.

Should you have any enquiry, please be free to contact the researcher at the following addresses:

E-mail: **darik2006@yahoo.com**

Telephone: **0911208696**

Thank you for your cooperation!

SECTION ONE: BACKGROUND OF RESPONDENTS

Instruction: Please provide your response for the questions related to your personal background by putting 'X' sign in the circles.

1. Educational status ☐ Diploma ☐ 1st Degree ☐ 2nd Degree and above

2. Please specify your educational profession

☐ Network administrator ☐ Database Administrator ☐ system Administrator

☐ Software programmer ☐ computer engineer ☐IT manager

☐project Manager

Specify if any other _____

3. Service Life Time (Experience) in the project management work

☐Under3 year ☐4-10 years ☐11-20year ☐21- 30 years ☐ above 30

SECTION TWO: **PROJECT SUCCESS FACTORS**

Instruction: Read the statements in the table and show to what extent you agree with them by marking (X) sign. The numbers represent: 1 =strongly disagree, 2= disagree, 3= neutral, 4=agree, and 5= strongly agree.

PROJECT SUCCESS FACTORS

No.	FACTORS	SCALES				
		I SD	2 D	3 N	4 A	5 SA
1. Top Management Support						
I.I	Top management team was supportive to project managers and teams					
I.2	Top management was readily available for decision making and guidance to the Project Manager and team					
I.3	Top management keeps a close eye on the project and is quick to intervene supporting the project manager when things start going wrong.					
I.4	Top management has consistently provided all the tools and resources required to successfully deliver the project					
I.5	There was a stirring committee to manage EthERNet project					
I.6	The stirring committee was organized from different discipline & different stakeholder					
I.7	The stirring committee evaluate and monitor the EthERNet project continuously					

1.8	The stirring committee get progress report every time					
2	**Experienced project manager**					
2.1	The Project Manager was adequately trained to successfully deliver EthERNet project.					
2.2	The success of an EthERNet project was highly dependent on the specific Project Manager assigned to the project and not the established project management policy and methodologies.					
2.3	The project manager validated for consistency with change of user requirements against the initially signed off requirements/ objectives					
2.4	The project manager had ability to make effective leadership and decision making					
2.5	The Project manager had Commitment to project goals and objectives					
2.6	The project manager had communication skills in all its forms					
2.7	The project manager had Project team Motivation and team building skill					
3	**User Involvement**					
3.1	EthERNet project end users were involved at all stages of the project.					
3.2	User Requirements are documented and signed off by the Senior User (Department that will utilise the end product)					
3.3	Acceptance testing was confirmed by End user					
3.4	The necessary training was arranged for all End user					
4	**Clear Business Objectives**					
4.1	The project had clear goals but only at the senior level					
4.2	The goals are set in accordance with the requirements of the customer					
4.3	Project Executive Sponsors are clear on Business Objectives					
4.4	Business Objectives are documented and signed off by the Executive Sponsor					

5	**Project Scope**					
5.1	The EthERNet project was implemented phase by phase approach					
5.2	When project scope was changed accordingly there was replanning and documentation					
5.3	What major activities need to be done and to what end result expected is clearly defined.					
6	**Firm Basic Requirements**					
6.1	All key stakeholders are identified and included in the requirement definition					
6.2	Project Risks are identified and documented					
6.3	A plan is formulated for the identified risks					
7	**Standard Infrastructure**					
7.1	The EthERNet project works over the stable infrastructure					
7.2	The Infrastructure is scalable and robust					
7.3	Stable Internet is available to run EthERNet project					
8	**Reliable Cost Estimates**					
8.1	The project planning team has applied a realistic cost estimates					
8.2	Changes in specifications and designs are adequately taken into account					
8.3	Enough time has been given for proper cost estimation.					
9	**Formal Methodology**					
9.1	The approprate tools and techniques has applied for this project					
9.2	The project followed traditional Project Management methodology which is Initiation/planning /execution/monitoring & evaluation/closing					
9.3	The project applied the modern project methodology which are PMBOK(project management body of knowledge) and					

	CPM(critical path method)					

10. If any other factor different from the above nine factors are please specify below

_____

_____

_____

_____

N.B

The **Steering Committee is** a committee who typically provides support, guidance and oversight of progress.These committee members do not usually work on the project themselves. Generally, the Project Manager, and other members of the Project Team, actually do the work implementing the project.

PMBOK stands for **Project Management Body of Knowledge** and it is the entire collection of processes, best practices, terminologies, and guidelines that are accepted as standards within the project management industry.

Critical path method (CPM): The **critical path method** is a step-by-step project management technique for process planning that identifies **critical** and noncritical tasks, preventing timeframe problems and process bottlenecks.

APPENDIX B

Guiding interview questions

1. How do you evaluate the planning, scheduling and controlling process of the EthERNet project?
2. How do you see risk management of this project?
3. How was the project management process taking place?
4. How do you evaluate stakeholder management?
5. Do you think all documentation of this project properly managed?
6. What was the project approved cost, paid cost, scheduled date and completed date?

APPENDEX C

Detail ranking of factors contributing for the success of EthERNet project Owner views

		Significance/frequency					Total Value	RII	Rank
	Factors	1	2	3	4	5			
1	**Top Management Support**								2
1.1	Top management team was supportive to project managers and teams	0	0	0	20	4	116	0.96	
1.2	Top management was readily available for decision making and guidance to the Project Manager and team	0	0	0	19	5	101	0.84	
1.3	Top management keeps a close eye on the project and is quick to intervene supporting the project manager when things start going wrong	0	0	1	16	7	102	0.85	
1.4	Top management has consistently provided all the tools and resources required to successfully deliver the project	0	0	0	20	4	100	0.83	
1.5	There was a stirring committee to manage EthERNet project	0	0	0	22	2	98	0.81	
1.6	The stirring committee was organized from different discipline & different stakeholder	1	15	8	0	0	55	0.45	
1.7	**The stirring committee evaluate and monitor the EthERNet project continuously**	0	0	0	20	4	100	0.83	
1.8	The stirring committee get progress report every time	0	0	0	14	10	106	0.88	
	AVERAGE							**0.80**	
	User Involvement								1
2.1	EthERNet project end users were involved at all stages of the project.	0	0	0	18	6	102	0.85	
2.20	User Requirements are documented and signed off by the Senior User (Department that will utilise the end product)	0	0	0	14	10	106	0.88	
2.3	Acceptance testing was confirmed by End user	0	0	0	10	14	110	0.91	
2.40	The necessary training was arranged for all End user	0	0	0	11	13	109	0.90	

	AVERAGE							**0.88**	
3	**Experienced project manager**								
3.1	The Project Manager was adequately trained to successfully deliver EthERNet project.	0	0	5	17	2	93	0.77	3
3.2	The success of an EthERNet project was highly dependent on the specific Project Manager assigned to the project and not the established project management policy and methodologies	0	0	0	19	5	101	0.84	
3.3	The project manager validated for consistency with change of user requirements against the initially signed off requirements/ objectives	0	5	10	8	1	77	0.64	
3.4	The project manager had ability to make effective leadership and decision making	0	0	4	10	10	102	0.85	
3.5	The Project manager had Commitment to project goals and objectives	0	0	4	12	8	100	0.83	
3.6	The project manager had communication skills in all its forms	0	0	14	9	1	83	0.69	
3.7	The project manager had Project team Motivation and team building skill	0	0	10	13	1	87	0.72	
	AVERAGE							**0.76**	
4	**Clear Business Objectives**								4
4.1	The project had clear goals but only at the senior level	0	0	0	19	5	101	0.84	
4.2	The goals are set in accordance with the requirements of the customer	0	0	4	19	1	93	0.77	
4.3	Project Executive Sponsors are clear on Business Objectives	0	4	5	14	1	84	0.7	
4.4	Business Objectives are documented and signed off by the Executive Sponsor	0	0	10	13	1	87	0.72	
	AVERAGE							**0.75**	
5	**Project Scope**								5
5.1	The EthERNet project was implemented phase by phase approach	0	0	0	23	1	97	0.8	
5.2	When project scope was changed accordingly there was replanning and documentation	0	0	10	12	2	88	0.73	
5.3	What major activities need to be done and to what	0	5	3	14	2	85	0.7	
	end result expected is clearly defined								

	AVERAGE							**0.74**	
6	**Standard Infrastructure**								6
6.1	The EthERNet project works over the stable infrastructure	0	10	3	9	2	75	0.65	
6.2	The Infrastructure is scalable and robust	0	5	0	10	9	95	0.79	
6.3	Stable Internet is available to run EthERNet project	0	10	5	8	1	72	0.6	
	AVERAGE							0.68	
7	**Firm Basic Requirements**								7
7.1	All key stakeholders are identified and included in the requirement definition	0	1	0	9	14	108	0.9	
7.2	Project Risks are identified and documented	5	10	0	9	1	66	0.55	
7.3	A plan is formulated for the identified risks	1	11	0	9	3	74	0.61	
	AVERAGE							**0.68**	
8	**Formal Methodology**								8
8.1	The approprate tools and techniques has applied for this project	0	0	4	14	6	88	0.73	
8.2	The project followed traditional Project Management methodology which is Initiation/planning /execution/monitoring & evaluation/closing	0	4	5	10	9	100	0.83	
8.3	The project applied the modern project methodology which are PMBOK(project management body of knowledge) and CPM(critical path method)	14	4	5	0	1	42	0.35	
	AVERAGE							**0.63**	
9	**Reliable Estimates**								9
9.1	The project planning team has applied a realistic cost estimates	5	8	5	4	2	62	0.51	
9.2	Changes in specifications and designs are adequately taken into account	4	5	6	8	1	69	0.57	
9.3	Enough time has been given for proper cost estimation	0	5	5	10	4	85	0.79	
	AVERAGE							**0.62**	

Detail Ranking of factors contributing for the success of EthERNet project vender views.

		Significance/frequency					Total Value	RII	Rank
	Factors	1	2	3	4	5			
1	**Top Management Support**								1
1.1	Top management team was supportive to project managers and teams	0	0	0	10	5	65	0.86	
1.2	Top management was readily available for decision making and guidance to the Project Manager and team	0	1	0	9	5	63	0.84	
1.3	Top management keeps a close eye on the project and is quick to intervene supporting the project manager when things start going wrong	0	0	4	9	2	58	0.77	
1.4	Top management has consistently provided all the tools and resources required to successfully deliver the project	1	3	4	5	2	49	0.65	
1.5	There was a stirring committee to manage EthERNet project	0	0	1	10	4	63	0.84	
1.6	The stirring committee was organized from different discipline & different stakeholder	10	4	1	0	0	21	0.46	
1.7	The stirring committee evaluate and monitor the EthERNet project continuously	0	4	0	10	1	53	0.7	
1.8	The stirring committee get progress report every time	0	0	0	11	4	64	0.85	
	AVERAGE							**0.746**	

2	**User Involvement**								2
2.1	EthERNet project end users were involved at all stages of the project.	0	5	2	7	1	49	0.65	
2.2	User Requirements are documented and signed off by the Senior User (Department that will utilise the end product)	0	6	0	9	0	48	0.64	
2.3	Acceptance testing was confirmed by End user	0	0	2	10	3	61	0.81	
2.4	The necessary training was arranged for all End user	0	0	0	13	2	62	0.82	
	AVERAGE							**0.73**	
3	**Experienced project manager**								
3.1	The Project Manager was adequately trained to successfully deliver EthERNet project.	0	1	3	9	1	52	0.69	3
3.2	The success of an EthERNet project was highly dependent on the specific Project Manager assigned to the project and not the established project management policy and methodologies	0	0	2	12	1	59	0.7	
3.3	**The project manager validated for consistency with change of user requirements against the initially signed off requirements/ objectives**	0	3	2	9	1	53	0.78	
3.4	The project manager had ability to make effective leadership and decision making	0	1	3	10	1	56	0.74	
3.5	The Project manager had Commitment to project goals and objectives	0	2	4	7	2	54	0.72	
3.6	The project manager had communication skills in all its forms	0	5	3	7	0	47	0.62	
3.7	The project manager had Project team Motivation and team building skill	0	3	5	6	1	50	0.66	
	AVERAGE							**0.70**	

4	**Clear Business Objectives**								4
4.1	The project had clear goals but only at the senior level	0	2	0	10	2	54	0.72	
4.2	The goals are set in accordance with the requirements of the customer	0	7	2	5	1	45	0.6	
4.3	Project Executive Sponsors are clear on Business Objectives	0	2	3	9	1	54	0.72	
4.4	Business Objectives are documented and signed off by the Executive Sponsor	0	2	5	6	2	57	0.7	
	AVERAGE							**0.685**	
5	**Project Scope**								5
5.1	The EthERNet project was implemented phase by phase approach	0	2	0	10	3		0.78	
5.2	When project scope was changed accordingly there was replanning and documentation	0	10	0	3	2	42	0.56	
5.3	What major activities need to be done and to what	0	5	3	5	2	49	0.65	
	end result expected is clearly defined								
	AVERAGE							**0.66**	
6	**Standard Infrastructure**								6
6.1	The EthERNet project works over the stable infrastructure	0	8	3	2	2	43	0.57	
6.2	The Infrastructure is scalable and robust	0	0	1	10	4	0.84	0.79	
6.3	Stable Internet is available to run EthERNet project	0	10	2	2	1	39	0.52	
	AVERAGE							**0.62**	
7	**Firm Basic Requirements**								7
7.1	All key stakeholders are identified and included in the requirement definition	0	0	5	8	2	57	0.76	

7.2	Project Risks are identified and documented	2	8	0	4	1	39	0.52	
7.3	A plan is formulated for the identified risks	0	12	0	2	1	74	0.49	
	AVERAGE							**0.59**	
8	**Formal Methodology**								8
8.1	The approprate tools and techniques has applied for this project	0	4	6	4	1	47	0.62	
8.2	The project followed traditional Project Management methodology which is Initiation/planning /execution/monitoring & evaluation/closing	0	0	5	7	3	58	0.73	
8.3	The project applied the modern project methodology which are PMBOK(project management body of knowledge) and CPM(critical path method)	8	2	4	1	0	34	0.43	
	AVERAGE							**0.59**	
9	**Reliable Estimates**								9
9.1	The project planning team has applied a realistic cost estimates	2	2	5	4	2	47	0.62	
9.2	Changes in specifications and designs are adequately taken into account	2	7	2	2	2	40	0.53	
9.3	Enough time has been given for proper cost estimation	0	5	5	4	1	46	0.61	
	AVERAGE							**0.586**	

DECLARATION

I, the undersigned, declare that this MA thesis entitled: Assessment on challenges of EtERNet project implementation: the case of ministry of education is my original work, prepared under the guidance of Simon Tarekeg(Ass.Profeesor). All sources of materials used for the 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.

Name	Signature
St. Mary's University, Addis Ababa	JUNE ,2018

ENDORSEMENT

This MA thesis entitled: "Assessment on challenges of EtERNet project implementation: the case of ministry of education" conducted by Tiruwork Terefe has been submitted to St. Mary"s University, School of Graduate Studies for examination with my approval as a university advisor.

_____	_____
Name	Signature
St. Mary's University, Addis Ababa	JUNE, 2018