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Assessment of the Practice and Challenges of Information Technology Project Management: A Case in Ministry of Communication and Information Technology E-Procurement Software Project

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Assessment of the Practice and Challenges of Information Technology Project Management: A Case in Ministry of Communication and Information Technology E-Procurement Software Project

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A Research Project in partial fulfillment of the requirements for the award of the degree of
Masters of Project Management

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Statement of Declaration

I, Addiskidan Missker, have carried out independently a research work on the topic entitled — **Assessment of the Practice and Challenges of Information Technology Project Management: A Case in Ministry of Communication and Information Technology E-Procurement Software Project** in Addis Ababa in partial fulfillment of the requirement for the Degree of Masters of art in Project Management with the guidance and support of the research advisor Abdurazak Mohammed (PHD.)

This study is my own work that has not been submitted for any degree or Master program in this or any other institutions.

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Statement of Certification

This is to certify that Addiskidan Missker has carried out this research work on the topic entitled **— Assessment of the Practice and Challenges of Information Technology Project Management:A Case in Ministry of Communication and Information Technology E-Procurement Software Project** under my supervision.

This work is original in nature and it is sufficient for submission for the partial fulfillment for the award of Degree of Masters of Art in Project and Management.

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ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE
GRADUATE PROGRAM

Thesis for MA in Project Management

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Abstract

The purpose of this study is to assess the practice and challenges of Information Technology Project management of Ministry of Communication and Information Technology E-Procurement Software Project. The research purposefully takes the whole population of project management team, both from MCIT and Perago, who are involved in the management process including the two project managers. The researcher used both primary and secondary data to achieve the intended research objectives. The primary data collected through self developed Likert scale structured questionnaire for the project process groups and an adapted Likert scale structured questionnaire for the major challenges of IT projects were distributed among six team members of the project management team including the project manager from MCIT and fifteen project management team members from Perago, the outsourced company including the project manager. The questionnaires were distributed online by using Google Form and the respondents were asked for their agreement/disagreement on existence and extent of the challenges in the project. Secondary data collected from compiled Terms of Reference and Status report Documents and had interviewed the two project managers. Data were analyzed using Google Form and Microsoft Excel and interpreted for percentage, mean and standard deviation. The findings of this study revealed that the project management practices were properly implemented as of the project management process groups except it missed proper feasibility study at initial stage and identified these major challenges insufficient skills within the team , delay in document approval ,older legacy systems issues ,too much project status reporting issues and insufficient technical knowledge within team. The feasibility study should be conducted in order to establish the validity of the benefits of the project locally by MCIT, different government organizations should prepare a suitable environment for the development of projects so as to understand and design the best solution for the existing unstructured system, prepare a project management team members meeting after each deliverables in order that the can go through the document with the reviewer and make amendments at the same time, have a IT training plan for team members to keep them updated with the latest technologies and project management training to help them to improve their ability of managing project, solving and analyzing a problem. ,and use tools like softwares to generate the report easily and also delegate a person who deals with status report preparation to the team.

***Keywords**: Information Technology project Management, E-procurement Software, Ministry of Communication and Information Technology. Perago*

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ABBREVIATIONS AND ACRONYMS

DR: Disaster Recovery

ICT:Information Communication Technology

IS: Information System

IT: Information Technology

ITPM: Information Technology Project Management

MCIT: Ministry of Communication and Information Technology

PM: Project Management

PMBOK: Project Management Body of Knowledge

PMO: Project Management Office

SOA: Service oriented architecture

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Chapter One
Introduction

This chapter presents the background to the research problem, describes information about the case company, situates and articulates the research problem, and highlights the research objectives and questions. It also defines the scope, and significance of the study.

1.1 Background of the study

ICT is a force that has changed many aspects of the way we live. If one was to compare such fields as medicine, tourism, travel business, law, banking, engineering and architecture, the impact of ICT across the past two or three decades has been enormous. The way these fields operate today is vastly different from the ways they operated in the past. But when one looks at education, there seems to have been an uncanny lack of influence and far less change than other fields have experienced. A number of people have attempted to explore this lack of activity and influence (Soloway and Prior, 1996).

The amount of information in organizations is heavily increasing and it has become vitally important to efficiently manage and share information inside the organization. Companies have to be swift in adopting new technology in order to remain competitive in a continuously developing business environment. This is where Information System come into play. Companies and other organizations are investing great sums in introducing information systems in the organization hoping to be able to make business more efficient and information sharing smooth.

The impact of Information Technology and its influence on organizational processes is an essential aspect of any growth strategy. It is hard to find any development or procedural change that does not have an IT aspect and in many cases it is actually the changes in available technology that drive the need to change organizational processes and economic development. To facilitate the rapid change in their organizational process and ensure economic development, in Ethiopia many governmental and private organizations apply and make use of different IT projects.

IT projects support every possible industry and business function.Therefore managing projects requires not only skills in information technology but also understanding of customers' area of business (Schwalbe, 2010). Managing complex IT projects is a difficult task because of constantly changing conditions, technology, resources, project requirements, and schedules (Murch 2001, Meredith and Mantel 2006).

Information Technology Project Management (ITPM) is a strategy to manage IT projects efficiently and effectively to achieve the success of IT projects (Demir & Kocabas, 2010). Understanding of ITPM is fundamental to the efficient use of resources and contributes to increased productivity (Jo & Barry, 2008).ITPM is managing any project dealing with IT infrastructure, information systems, or computer technology.

ITPM plays a key role in administration of IT projects in organization today. It also help to ensure that projects are being conducted accordingly and services are delivered respectively in line with the progress of information technology. Since IT is a growing industry ,it faces various challenges Doraiswamy & Shiv (2012).

The subsequent sub sections expound on the statement of the problem, the objective of the research and the profile of the case company (MCIT) as well the project (E-procurement Software).

1.2 Background of the Organization

The ministry was first established by the name *Ethiopian Information and Communication Technology Development Agency (ICTDA)* in 2003 with the Proclamation No. 360/2003.Then the Ethiopian government established the MCIT in 2010 recognizing the critical role of ICT in the national development .Its main vision is that every aspect of Ethiopian life is ICT assisted in the missions to develop, deploy and use information and Communication Technology, to improve the livelihood of every Ethiopian, and Optimize its contribution to the development of the country with the objective of improving Information and communications technology sector to become a political, economic and social activities in which contribute to increase the country's rapid development and progress.

The Vision 2020 proposes the setting up of a dedicated Project/Program Management Office (PMO) to oversee the various e-government initiatives across the country and ensure adherence to budget and timelines.

The Ministry is divided into five core directorates: E-Government Directorate, Standard and Regulatory Directorate, Capacity Building Directorate, Private Sector ICT Development Directorate and Coordination Office of Telecommunication & Postal Service Development. The point of focus of this project is Information Technology Project Management, E- Government Directorate will be the center of the play in which the Project Management team is part of.

To organize the project management team, different experts were selected to act as supporting team and a project manager appointed among them based on the complexity and budget of project. The same project manager may manage different projects at the same. When the work is completed, the technical personnel assigned, they will go back to their operational work. This project team had a monitoring, controlling and evaluation role and integrates the management of the technical testing (which will be done by MCIT itself) and the business aspect was forwarded to the business owners to be tested. Also, the team facilitated trainings to be given. And also it supported the E-Government Strategy implementation through outsourcing, monitoring project delivery, controlling the relationships with vendors, managing the procurement process, ensuring compliance with policies and standards, auditing projects at hand over, knowledge management and sharing in areas related to project management.

1.3 Project Profile of E-Procurement System

MCIT with the mandate of leading, coordinating, monitoring and controlling all government ICT activities including the E-Government for more effective and responsive services delivery realization, is supporting government organs for undertaking electronic service to citizens and businesses and also implementing common applications which will horizontally cut across all ministries and government agencies.

E-Procurement system is the direct copy of government procurement policy. MCIT has taken international experience (India) in order to identify the initial requirement. It is also one of the common applications that provide businesses and ministries/agencies with common platform to

transact with features such as demand aggregation, catalogue based procurement, dynamic pricing engine, etc. Given the high percentage of government procurement as a percentage of total procurement in the economy, the development and implementation of a comprehensive e-Procurement solution will substantially improve efficiency and cost effectiveness of government procurement.

As Kamel (2009) study, the internet is an enabling factor to many online applications that provides organizational processes more effective and more efficient (as cited in Pani & Agrahari, 2007). One of these applications is the procurement process that has traditionally involved slow and manual procedures for handling procurement transactions (as cited in Hawking et al, 2004). E-Procurement refers to the electronic acquisition of goods and services in a firm (as cited in Turban et al, 2006). E-Procurement has had an increasingly important role in business2business (B2B) commerce (as cited in Philips & Piotrowicz, 2006). Moreover, with the continuous improvement in ICT and especially Internet-related technologies, opportunities emerge to make procurement for goods and services more transparent and efficient (as cited in Carayannis & Popescu, 2005). E-Procurement has been advocated as a tool that can improve competencies and performance.

Benefits of adoption of E-Procurement system are Cost Saving, Process efficiency, better information flow between a firm and suppliers, reduced maverick spending, streamlined process, better inventory level, better services to customers, and improved speed of services to customers. Risks Associated with adoption of E-Procurement system are Internal business risks, External business risks, Technology risks, and E-procurement process risks (B. Kalaskar, 2016).

The primary objective of the project is to develop, implement and support a web based electronic public procurement system to automate the various stages of purchasing in MCIT from the initial identification of a requirement, through the tendering process, to the contract management in a common technological platform.

The system is used to create end-to-end procurement process of MCIT, including: Vendor management, Catalogue management. Bid process management, Auctions, Payment management accountability and Contract management which is used to improve the transparency and in procurements; reduce cost of procurement for government due to increased competition and demand aggregation; reduce cost of bidding; and improve turnaround time for payments.

Generally the system is required to support multiple delivery channels such as e-Procurement portal (that put all informational services related to Public Private Partnerships and Government Tenders), mobile devices/apps, Short Message Service (SMS), Integrated Voice Response (IVR), and Call Centers. The system should also integrate with the Ethiopian government e-Service and mobile platforms that serve as front-end applications to transact with citizens and businesses. The e-procurement system should as well have standardized interfaces to integrate with back-end/legacy systems i.e. manual system, various government portals, and should provide secured access to suppliers and external service providers. The system should be designed based on Service Oriented Architecture (SOA) that helps to seamlessly integrate the E-Procurement system with Enterprise services bus, national data sets, national payment gateway, national identity system, and other national development initiatives that MCIT currently undertaking.

In the case of E-procurement, it is the implementation of the law and the experience from the international organizations. Once the E-procurement software project fully completed, the ownership will be transferred to public procurement Agency (PPA) and hosted in national data center .In PPA, there are two committees for managing the E-Procurement software: Technical (project manager from E-procurement from MCIT is member) and Steering. MCIT used the newly developed online E-procurement system in parallel with the manual system, bid process are conducted online and bidder registered online (the MCIT used the system almost for a year).In order to make the software fully implemented, there are some comments from the donors ,in which they are guided ,to be included.

1.4 Perago Information Systems PLC

MCIT outsourced the E- Procurement Software development to Perago Information Systems PLC. Perago Information Systems PLC is a cutting edge and innovative technology based solution providing company with a focus on designing and developing Multi-channel based software solutions using different tools; Value-added banking solutions, custom software development and quality assurance services; E-services consulting, development, and implementation; design innovative public service delivery initiatives using technology solutions; E-governance enablement; ICT consulting; and capacity building, in Ethiopia and beyond. Perago is established by highly qualified and experienced professionals in management, economics, business administration, software engineering, and information systems management; and it also hosts professionals who are internationally certified in

leading edge information and communication technologies. Perago developed the E-Procurement Software by local capacity.

Perago also provides strong technical support and knowledge transfer to sustain the competitive advantages gained by customers from their investments for Perago's services. Beside the technical capacity, Perago's management has commendable entrepreneurial flair with strong ethical and professional standards.

Perago has to undertake the following activities in the outsource process when it is awarded the bid from MCIT.

1. **System Study**

   Conduct a detailed system study to understand the public procurement legislations, policies, directives, and business processes currently practices by MCIT, identify the complete workflow of all processes that has to be automated and as the result of the above study, the bidder has to develop and submit a Functional Requirements Specification (FRS) will be accepted by the project management team of MCIT. Based on the FRS, Perago will conduct system analysis and design the solution to meet the requirements.

2. **Develop / Customize application software**

   Supply, install, and fully implement the system with all the business requirements. E-procurement software has to have user friendly interface, reporting tools, including browsing, and drill down capabilities, it should have an ability to implement new workflows using graphical interface with minimal scripting and should provide response times, back-up, recovery, security, history, archive, help, audit trails, etc. in accordance with the best of contemporary standards.

3. **Preparation and Set up of Testing and Production environment**

   Install and setup the platform for the proposed solution - application and database on the Testing and Production server(s) and configuration of all system parameters and setup-screens and use the Testing environment to conduct user trainings.

4. **Testing**

   Perform all requisite testing at various phases of the development life cycle namely – unit, module, integration and system testing in order to ensure that the system meets the defined

business requirements. MCIT might carry out its own tests and / or use 3rd party testing tools or hire vendor to verify the quality of the developed application or services.`

5. **Support User Acceptance Testing**

   Assist the designated users to perform user acceptance testing of the complete solution. Once the users complete their testing, the complete solution will be tested by the Quality Assurance (QA) team of MCIT or third party assigned by MCIT. This testing shall also include security testing and also compliance to the ISO 27001 standards. All the observations identified during the above testing by designated users, QA, etc should be rectified by the bidder before moving the solution to the production environment.

6. **Software Source Codes**

   Deliver the source code for the software and MCIT will be the owner of the source code.

7. **User Training –Application**

   Train the designated end users in using the developed application and train the designated technical users on the administration and maintenance of the solution.

1.5 *Statement of* the *problem*

The impact of IT and its influence on organizational processes is an essential aspect of any growth strategy. It is hard to find any development or procedural change that does not have an IT aspect and in many cases it is actually the changes in available technology that drive the need to change organizational processes and economic development. To facilitate the rapid change in their organizational process and ensure economic development, many governmental and private organizations apply and make use of different IT projects (Pirhonen, 2013).

Pulse of the Profession conducted a research to measure performance metrics of IT projects as of 2011 till 2017 the result shows that average of 70% of them met original goals/business intent , 55% completed within original budget , 50% completed on time ,50% experienced scope creep ,30% failed projects' budget lost , and 15% deemed failures (Pulse of Professions ,2017.p.5).

From the above report, this research project understands that most IT projects had challenged in meeting their original goal or business intent, in completing with the original budget and time. Also most IT projects experienced scope creep and end up failed. Various reasons can be listed for the above listed poor performance of IT Projects. Since IT Projects are means for rapid change and

economic development assurance, the poor performance of most IT projects which has resulted from different challenges, will lead to economic loss and public dissatisfaction. As a result, it is essential to assess the practice and examine the challenges in ITPM in order to understand the process, examine challenges to so as minimize the delays and their corresponding costs and time. Successful completion of IT projects leads to economic growth.

The reason to conduct this study largely depends on personal experience and also different sources shows that IT projects are challenged. Therefore, there is a need to assess the practice of the ITPM and examine associated challenges in IT. So the researcher selected one of the public IT Projects: E-Procurement Software Project of Ministry of Information Technology in order to assess the practice of Information Technology Project Management and examine different challenges affecting the Information Technology Project Management.

1.6 Research questions

Accordingly, the researcher raises the following basic research questions for addressing the problems to the study:

1. What are the practices of ITPM in case of MCIT E-Procurement Software Project?
2. What are the major challenges affecting ITPM process of MCIT E-Procurement Software Project?
3. What is extent of these challenges affect the effective implementation of MCIT E-Procurement Software Project?

1.7 Objective of the study

1.7.1 General objective

The overall objective of the study was to assess and examine the challenges and practices of ITPM in case of MCIT E-Procurement Software Project.

1.7.2 Specific objectives

To achieve the general objective, the study had the following specific objectives the case of E-Procurement Software Project Management of MCIT

1. To review the practice of ITPM.
2. To assess the main challenges of ITPM.
3. To examine the extent of major challenges of the IT Project.

4. To propose suitable and important suggestions for the challenges indicated in the study.

1.8 Significance of the study

The findings of the project will be provided to MCIT and Perago Information Systems PLC to understand their practice and challenges of ITPM of E-Procurement Software project also the recommended solutions assist them to design interventions to overcome the encountered challenges by utilizing the suitable and important suggestions for the problems indicated in the study. The findings is also helpful to regulatory government organizations such as the Public Procurement Agency and it is helpful for the different federal offices who are going to use the online E-procurement software so that they can visualize the problems and design solutions for the challenges they faced.

1.9 Organization of the Paper

The study is organized and presented in five chapters. Chapters one, two and three consist of Introduction, Review of Literature and Research Methodology respectively. The Presentation and analysis of the data will be presented in Chapter four while the last chapter (chapter five) will contain the Summary, Conclusions and Recommendations.

1.10 Scope of the study

This study focuses on assessing the practices and main challenges of Information Technology Project Management of E-Procurement software project of MCIT which was conducted from year 2016 to 2018 in Addis Ababa, Ethiopia. The population of the study comprises the project management team members of MCIT such as project manager, programmers and testers also project management and software development team members from Perago such as project managers, team leaders, testers, analysts, and application developers who were involved in the development and management of the software.

Chapter Two
Literature Review

This literature review part is to provide a summary of previous related studies on the research problem areas. The available literature is aimed at reviewed to identify the major concepts and research problem related with this research topic. That is to answer the research questions and contribute to the emergent knowledge base of project management practice in IT industry. The literature review is more concentrating on the status of ITPM practice.

2.1 IT, IS and ICT definitions

In the field of information systems, various authors and researchers use different terms for projects Murch (2001) uses the term "IT (information technology) project", whereas Schwalbe (2010) uses the term "information technology project" or "software development project". Schmidt et al (2001) use the concept "IS (information systems) project". Several articles Boehm and Ross (1989), Keil et al. (1998), Wallace and Keil (2004) and also Cotterell and Hughes (1995) focus on the term "software project". Dekkers and Forselius (2007) article discusses "ICT (information and communication technology) projects".

The definitions of IS, IT and ICT are closely related to each other; however, they are different in their functions.

Torero and Braun (2006) offer a definition of ICT which incorporates equipment and services. For them, ICT "includes the computing industry(hardware, software, networks, the Internet, and related services); electronic data processing and display (such as photocopiers, cash registers, calculators, and scanners, as well as a myriad of less well known machines specifically tailored to production and manufacturing);telecommunications and related services (such as fixed and cellular telephones, facsimile machines, instant messaging, teleconferencing, and so on.); and audiovisual equipment and services (including television, radio, video, DVDs, digital cameras, compact discs, MP3 players, and so on" . Increasingly ICT is becoming a more and more powerful tool for education and economic development.

IT relates to the products, methods, inventions, and standards that are used for the purpose of producing information. It can also be defined as "the preparation, collection, transport, retrieval, storage, access, presentation, and transformation of information in all its forms (voice, graphic, text, video, and image).

DifferenceBetween.com (2018) tries to portray the distinction between ICT and IT. IT refers to an whole industry that employs Computers, networking, software and equipment to manage information, whereas ICT can be seen as an incorporation of IT with media broadcasting technologies, audio, video processing, and transmission and telephony. Therefore, ICT can be considered as a comprehensive acronym for IT. The term ICT is extensively used in the educational environment, where as IT is a term widely used in the industry. In addition, recently, ICT is also used to refer to the integration of telephone and audio visual networks with computer networks. In simplest terms, ICT can be seen as the incorporation of information technology with communication. IT refers to the products, methods, inventions, and standards that are used for the purpose of producing information (Kroenke, 2007).

An IS is defined to be a set of information resources utilized to collect, store, process, maintain, use, share, disseminate, dispose, display, or transmit information (Committee on National Security Systems 2006). And similarly Wognum et al (2004) note that ISs purpose is to support companies in their information needs. IS is a set of components which interact to produce information, which include hardware, software, data, procedures, and people, whereas these components can be found in every information system (Kroenke, 2007).Information technology (IT; i.e. hardware and software) is one significant component in an information system (IS).

In this thesis Project, the concept of *information Technology project (IT project)* refers to all the above-mentioned subtexts.

2.2 What is Project?

A project is a typical work form in the field of information systems and can be defined as a group of people and other resources that are temporarily together to accomplish a specific objective to be completed within certain specifications, defined schedule, and a budget (Liu and Horowitz 1989,

Schwalbe 2010). In addition, Schwalbe (2010) underlines that projects are always unique and often customized, which can cause uncertainty in their planning and implementation.
Project is a unique process, consist of a set of coordinated and controlled activities with start and finish dates, undertaken to achieve an objective confirming to specific requirements, including the constraints of time cost and resource and having its own assigned Project Manager. Projects result in the creation of one or more deliverables.

All organizations have projects. Projects can be managed using a common set of project management processes. In fact, a similar set of project management processes can be utilized regardless of the type of project. For instance, all projects should be defined and planned and all projects should have processes to manage scope, risk, quality, status, etc.

ICT projects are usually thought as merely a set of activities requiring only hardware, networking systems, software and applications with the end goal of introducing technological changes (Schwable, 2014).
Actually, managing ICT projects are quite challenging which need proper project management practices until the closure of the project Basically, such endeavor primarily is attempted by giving a due attention the strategically context; larger goals of the organization.

IT projects are getting great interest in the computer industry because they touch almost everyone's lives. Accurate computerized information is needed to make good decision in less time for any kind of IT projects either for business, financial, educational, government, military, or nonprofit organization. However, this computerized information is only as good as the design and management of the IT project systems. The successful IT project produces the highest quality products with the fewest number of defects in the shortest, most cost−effective manner that satisfies customer needs by following s reliable project management approach.

2.3 What is Project Management?

Project management is an application of knowledge, skills, tools and techniques to project activities to meet project requirements. This is accomplished through the application and integration of the project management processes of initiation, planning, executing, monitoring and controlling and closing

(PMI, 2013).In which, one has to know exactly what knowledge, skills, tools, and techniques needed to successfully manage a project. Project managers strive to meet the triple constraint by balancing project scope, time, and cost goals.

It is helpful to look at project management from three distinct views. First, to what degree the project fits into the organization to both the project and the individuals who will be associated in it, including how their tasks are defined and how they work together with each other. Second, how the project will develop over time refers to as the project life cycle and is the chronological order of activities that are necessary to convey the project and last the skills required to successfully manage the project.
The purpose of project management is to use the resources on hand effectively to realize a set goal with a certain standards and within a schedule and budget, utilizing the existing resources efficiently (Liu and Horowitz 1989).The main responsibilities of project management include defining the requirements; creating the amount of work, assigning the resources required, planning the execution of the work, monitoring the progress, and adjusting deviations from the plan (Munns and Bjeirmi, 1996). It also defines project management as "the process of controlling achievement of the project objectives. Project Management consists of nine knowledge areas: integration management, scope management, time management, cost management, quality management, human resource management, project communications management, project risk management, and project procurement management (PMBOK 2008). Furthermore, one significant part of project management is to manage project knowledge so that learning between individuals and between projects is managed (Reich, Gemino and Sauer 2008).

Project management effectiveness is a measure of quality of attainment in meeting objectives. It is the extent to which the goals of a project are attained, or the degree to which a system can be expected to achieve a set of specific requirements (Wideman 2002).

Project Management has been found as one of the most important aspects of the entire development process of IT in the sector. The main objective of project management is to make sure the projects finish in time, in the specified budget limit, with in defined scope and desired quality for achieving other project objectives.

2.4 Characteristics of IT Projects

ICT project management includes overseeing projects for software development, hardware installations, network upgrades; cloud computing and virtualization rollouts, business analytics and data management projects and implementing IT services. The aim of implementing ICT project is not the technology itself, but achievement of certain business goals such as improved customer service or increased profitability (Dutta, Geiger and Lanvin, 2015).

As the focus of this thesis project is assessing the Project Management of Software development projects, it is good to know the classifications and characteristics of them.

Software development projects are one element of IT projects. Many IT projects involve researching, analyzing, and then purchasing and installing new hardware and software with little or no actual software development required. However, some projects involve minor software modifications to enhance existing software or to integrate one application with another. Other projects involve a major amount of software development. Many argue that developing software requires project managers to modify traditional project management methods, depending on a particular product s life cycle (Schwable, 2011).

In order to be beneficial from the investment of IT Projects in an organization, the characteristics and unique features of the IT Projects (unlike other) should be well acknowledged. Though many of the principles of project management can be applied to just about any project, but IT projects are unique in several ways.

(Peffers, Gengler and Tuunanen, 2003)summarized the main characteristics of IT projects into seven categories abstract constraints, difficulty of visualization, excessive perception of flexibility, hidden complexity, uncertainty tendency to software failure, and goal to change existing business processes.

(Jurison 1999, Schwable 2010, Rodriguez-Repiso, Setchiand Salmeron, 2007), IT projects are distressed by a number of alterations, including technology, project requirements, as well as staff and the external environment. IS projects are different from other projects that they are very diverse. IS

projects are characterized by high complexity, conformity, changeability, invisibility, and high chances of failure.

2.5 Classification of IT Projects

(Cadle &Yeates, 2008) grouped IT Projects into nine broad types: Software development, Package implementation, System enhancement, Consultancy and business analysis assignments, Systems migration, and Infrastructure implementation and Outsourcing (and in-sourcing), Disaster recovery and Smaller IS projects. For either type of projects, the general principles of managing any project are essentially the same; there are some differences in the dynamics of each type that the project manager needs to keep in mind.

1. **Software development**

   It can be defined as a process to make new software to replace the old software or to fix the existing software.

   Eight characteristics of successful Software development projects identified by (Venema,2018) are clear and realistic goal, Powerful team-leadership ,Sense of ownership, Commitment to quality, getting things done, Psychological safety, incorporate the right skills in your team and ability to take over if either one of your teammates decides to move on to other projects.

2. **Package Implementation**

   It is a quicker and cheaper way of meeting customers' system requirements by obtaining a pre-existing software package and installing it as an substitute .It is simple that the package is bought, installed, switched on and used.

3. **System enhancement**

   This occurs when users want to improve the systems they are using to provide new features or functions or perhaps to meet some external demands. In doing so, a continuous testing should be done to ensure that the new enhancement do not damage parts of the existing system which was working well.

4. **Consultancy and business analysis assignments**

   These are kinds of IT Projects examine a business issue and recommend solutions to business organizations.

5. **Systems Migration**

   The existing working system must be moved to a new operating environment when it is no longer supported in the existing setting. Some software development may be done because the new platform doesn't work exactly like the old one in order to create interfaces with other systems.

6. **Infrastructure Implementation**

   This type of IT project includes ones to introduce or replace hardware, servers or PCs, for example, to put in place communications infrastructures and also sometimes the physical construction of things like computer suites or the fitting out and equipment of a new office building.

7. **Outsourcing (and in-sourcing) outsource**

   This type of IT project subcontracts the business processing to another organ such as to introduce or replace hardware, servers or PCs.Sometimes, it is not just the IT systems themselves that are outsourced but whole areas of business processing, including the systems that support these processes.

8. **Disaster Recovery**

   Disaster Recovery projects is used in order to get the organization back on its feet as soon as possible and, as far as is practical, to ensure the continuity of the business after any disaster.

9. **Smaller IS projects**

   Some well-established principles and techniques for managing most forms of IT project are not really necessary for a small project. If someone is working on a small project , the project management approach selected should deliver the best value for money in terms of getting the job done and ensuring adequate control. So clearly, with a small project, it is both practical and sensible to adjust the project management approach to the size of the project. In that,

typical project management deliverables, such as plans and reports, should be abbreviated so that they are proportional to the size of the project being undertaken.

2.6 IT Project Management (ITPM)

Many IT projects are cancelled before completion, many run over budget and over time, and many that are completed are not able to satisfy customers´ needs (Standish Group 2009, Cerpa and Verner 2009).IT projects support every possible industry and business function therefore managing projects requires not only skills in information technology but also understanding of customers' area of business (Schwalbe 2010). Managing complex IT projects is a difficult task because of constantly changing conditions, technology, resources, project requirements, and schedules (Murch 2001, Meredith and Mantel 2006).

ITPM is a strategy to manage IT projects efficiently and effectively to achieve the success of IT projects (Demir&Kocabas, 2010). Understanding of ITPM is fundamental to the efficient use of resources and contributes to increased productivity (Jo & Barry, 2008).ITPM is managing any project dealing with IT infrastructure, information systems, or computer technology.

ITPM plays a key role in administration of IT projects in organization today. Various studies have been conducted on the ITPM to ensure that projects are being conducted accordingly and services are delivered respectively in line with the progress of information technology. Number of failures in IT projects internationally and locally is tremendous. ITPM most used standard project management methodology such as PMBOK or PRINCE2. Currently most organizations will use a business process management (BPM) approach which is a new discipline in project management, to help increase the success of IT projects. This approach combines the methods of management and information technology and it is believed that can improve the management of IT projects to meet the needs of consumers (Kamaliyah and Yazrina, 2015).

ITPM employs project management principles and tools that should be part of a methodology, which consists of step-by-step activities, processes, tools, controls and deliverables defined for the entire project. Thus, IT projects failures are avoided. (Marchewka, 2015)

Actually, managing ICT projects are quite challenging which need proper project management practices until the closure of the project Basically, such endeavor primarily is attempted by giving a due attention the strategically context; larger goals of the organization(Schwable, 2014).

By its nature, IT projects are full of risks as a result risk management should be an integral part of IT project management. Risk has three fundamental elements: nature of the possible disruptive event; the probability that an event will occur; and the impact should the event occur (Cooke, 2005). Risk is assessed in terms of business continuity and institutional impact, as well as influence on the strategic mission of the entities involved in the project. In rare cases, risk is too great to initiate a project, but typically strategies of risk avoidance, acceptance, mitigation, and transfer are adopted.

2.7 ITPM Process

Projects that exist within an organization do not function as a secluded system. They require input data from the organization and beyond, and deliver capabilities back to the organization. The project processes may generate information to improve the management of future projects and organizational process assets.

PMBOK (2013) describes the nature of project management processes in terms of the integration between the processes, their interactions, and the purposes they serve. Project management processes are grouped into five categories known as Project Management Process Groups (or Process Groups). The five process groups that the project undergoes from initiation to closing.

As clearly depicted on PMBOK (2013), the five process groups are describes as follows:

1. **Initiation** – the project goal, need or problem is identified. The project manager is assigned to the project, the project charter is created, and feasibility study is conducted, terms of reference organized, and teams are appointed.
   It defines and authorizes the project or a project phase
2. **Planning** – scope of the project is defined, refine the objectives, and define the course of action required to attain the objectives that the project was undertaken to achieve. Also the project manager and the project team work together to plan all of the needed steps to reach a successful project conclusion. The project planning processes

are iterative in nature and it's expected that planning will happen often throughout the project.

3. **Execution** – once the project plan has been created, the project team goes about executing the project plan to create the deliverables of the project. The project can shift to project planning as needed throughout project execution.

   It integrates people and other resources to carry out the project management plan for the project

4. **Monitoring and controlling** – as the project is being executed by the project team, the project manager monitors and controls the work for time, cost, scope, quality, risk, and other factors of the project. Monitoring and controlling is also an ongoing process to ensure that the project addresses its targets for each project objective.

   It regularly measures and monitors progress to identify variances from the project management plan so that corrective action can be taken, when necessary, to meet project objectives

5. **Closing** – at the end of each phase and at the end of the entire project, project closure happens to ensure that all of the work has been completed, is approved, and ultimately transferred ownership from the project team to operations.

   It formalizes acceptance of the product, service, or result and brings the project or a project phase to an orderly end.

2.8 Project Management Life Cycles

P***roject Management Life Cycle*** which is universal to all projects is defined as collection of activities necessary to fulfill a project's objectives .The specific phases within a project, however, are unique to each project and represent the project life cycle (Cadle&Yeates, 2008).One may have one phase, others may have many. Phases can be sequential(back-to-back),iterative(cyclic) or overlap(simultaneous at points).With wrong lifecycle approach, you run the risk of cost overruns, long delivery delays, and potentially a failed projects(Lipton,2017).

As Lipton (2017 cited from PMBOK Guide-Sixth Edition (2017)) calls out two life cycle approaches: Predictive and Adaptive. Then it subdivided the Adaptive lifecycle approach into multiple phases that will call development lifecycles:

- **Predictive Lifecycle** is fully plan driven like waterfall where the three main project constraint (time, scope , cost) are all determined at a detailed level at the start of the project. One need to know your requirements going on, and the scope is fixed at the onset. Each phase is then laid out sequentially and managed carefully. Over time, to allow for more precise planning, the approach has allowed for "progressive elaboration" or "rolling wave planning". Progressive elaboration doesn't change the scope. It allows you to roll out the schedule into shorter passes.
- **Iterative Life Cycle** – As timeframes for delivery got shorter, and requirements got less clear, we needed additional lifecycle approaches that could handle the changes faster and less expensively. We found that when you broke large and complex projects down into smaller phases (cycles), it gave us more control (decreased risk and cost of rework). As the name implies, you execute the project in small iterations, giving you the ability to better define requirements at the start of each cycle. The *PMBOK® Guide* recommends that you still define scope early in the project, but that you modify time and costs after each iteration since you will understand them better.
- **Incremental Life Cycle** – Many times you will see the incremental approach grouped with the iterative. They are similar but also different. The incremental lifecycle approach develops a product through the implementation of incremental steps which have **predetermined timeframes**. Each increment delivers additional functionality for the product and is repeated until the final deliverable is produced. Like with the iterative approach, customers sign off at each exit point. This approach is great when you want to do prototyping and reduce change risk along the way.
- **Adaptive Life Cycle** (change-driven, also known as Agile) **–** Everyone wants rapid development these days, so when you need to execute a project fast, Agile is the way to go. This approach was built to handle changes and reduce inherent risk. Teams deliver software updates in weeks instead of months.

  Adaptive projects are quick and time bound with two critical success factors: the customer must be closely involved in the process and one must be able to define incremental requirements at the start of each iteration. If requirements are not well

known, like when you are developing a first of its kind application, the adaptive approach works nicely.

- **Hybrid Life Cycle** – As it implies, the Hybrid takes the best of all approaches. You can use a predictive approach for the elements of the project that are known and an adaptive approach for the elements that will become apparent over time.

2.9 Project Management Methodologies for IT Projects

Information Technology Services Management group (ITS Project Management Group, 2012) defined a project management methodology as ,it is a conceptual framework for program and project management, which gives a set of guidelines, standards and processes. There are a number of project management methodologies in existence that have been created and adopted by project managers. Each of these methodologies, though intend to lead to the same successful results, presents slightly different approaches to management of projects.

Unlike other types of projects, IT projects are distinct and therefore must possess a unique set of project management tools and techniques to carry out them. However, project management techniques and tools can used to any project in any industry, regardless of whether it involves software, hardware, construction, engineering, or services. It is not the tools that are different, but rather the projects. What make IT projects different are their unique risks, the rapid development requirements to meet rush-to-market demands, the short life of technology, and multiple dependencies with other projects. The tools are the same, but they must be applied differently depending upon the project type and complexity

As project managers, there are many different ways to deliver projects. Broadly speaking, these ways are our methodologies – applying different principles, themes, frameworks, processes and standards to help provide structure to the way we deliver projects.

PMI has developed *The Guide to the Project Management Body of Knowledge* (PMBOK), now in its fourth edition, a leading guide of PMI standards for project managers worldwide. The PMBOK guide is not a methodology itself, but promotes several key components that good methodologies must contain. The use of a specific methodology, or procedure, gives managers a directive on undertaking their projects that can help achieve the goals they desire to ultimately accomplish.

IT projects are different and therefore must have a unique set of project management tools and techniques to accomplish them. However, project management techniques and tools can apply to any project in any industry, regardless of whether it involves software, hardware, construction, engineering, or services. It is not the tools that are different, but rather the projects. What make IT projects different are their unique risks, the rapid development requirements to meet rush-to-market demands, the short life of technology, and multiple dependencies with other projects. The tools are the same, but they must be applied differently depending upon the project type and complexity.
Some (or all) of these factors should be taken into account when selecting methodologies like size of the project, duration, complexity, organizational factors, such as clients or stakeholders, external and internal(Haworth, 2017).

A review of the five major project management methodologies will be discussed as follows. These methodologies include: Agile, Prince2, Six Sigma, System Development Life Cycle (SDLC), and Waterfall.

2.9.1 Agile

The software industry faced significant challenges with the rise of computer processing and the Internet Age. Software developers were unable to create a sustainable software application product because of the number of glitches that a software application faced in different microcomputer environments or with upgrades to computer operating systems. This prompted several information technology engineers to come together at the turn of the twenty- first century to create the Agile Alliance (Mellor, 2005). In the Alliance's well-known *Agile Manifesto,* the proponents of a more lightweight method of software development share a project management methodology that has become recognized as an Agile Project Management.

Agile methodologies take an iterative approach to software development. Unlike a straightforward linear waterfall model, agile projects consist of a number of smaller cycles - sprints. Each one of them is a project in miniature: it has a backlog and consists of design, implementation, testing and deployment stages within the pre-defined scope of work.

Agile projects are suited to Projects where your organization is responsible for the whole process, with scope for changing requirements, larger, undefined, complex projects and Projects with an involved client(Haworth, 2017)..

2.9.2 Prince2

The Prince2 project management methodology stands for Projects IN Controlled Environments (Skogmar, 2015) and was developed in 1989. It is the project management standard for the UK government's information technology projects, though it is now used extensively in both the public and private sectors. It is one of waterfall methodologies that are used on IT Projects. Prince2 is described as a structured project management approach and centers on eight characteristic techniques for the successful administration and control of a project (Ibid).

The PRINCE2 methodology is a tailored process approach to plan management. It offers a framework encompassing all facets of a task. PRINCE2 is a best-practice approach for the management of all types of projects. The PRINCE2 Methodology provides defined inputs and outputs for each process. This includes specific objectives or actives that are to be carried out. PRINCE2 has become progressively more popular and is now the recognized, established standard for project management in the UK and elsewhere.

2.9.3 Systems Development Life Cycle (SDLC)

With the arrival of computer information systems, organizations discovered the need to manage the systems that created, stored, or utilized the information for their businesses. While information systems were in place before microcomputers, the vast amount of information that could be housed within databases and servers introduced a new frontier for project management professionals.

Systems Development Life Cycle, sometimes referred to as Software Development Life Cycle or SDLC, is the "process that is followed to define needs, design a solution and then build the solution" **(**Whitten and Bentley, 2007). Explains that while there is a slight difference in a systems development lifecycle and a software

development lifecycle, both have borrowed concepts from each other and include the development of a structural framework of stages to improve an application or system and guide it through these stages to implementation in the field(ibid). The systems development life cycle has been reported to be one of the more prominent concepts that have come from the field of information systems because it has had a significant bearing on programs, study, and practice of information systems (Hedman and Lind, 2009). Most systems development life cycle follows five clear-cut phases: "planning and problem identification, analysis, design, realization, and use and maintenance" which is most often referred to as the Waterfall method (Ibid).

Waterfall, often referred to as is a SDLC (Software Development Life Cycle) project management methodology theme with a very simple approach that values solid planning, doing it once and doing it right, rather than the agile approach of incremental and iterative delivery. It's simple to understand because you simply make a good plan, and execute on it (Aston ,2017).

The project manager tends to be large and in charge, and work is planned extensively up front and then executed, in strict sequence, adhering to requirements, to deliver the project in a single, and usually very long cycle.

Requirements are defined in full at the beginning, at the top of the waterfall, before any work starts. Work then cascades, like water down a waterfall through phases of the project. In a waterfall model, each phase must be completed before the next phase can begin and there is no overlapping in the phases. Typically, in a Waterfall approach, the outcome of one phase acts as the input for the next phase sequentially. Once you're in the testing stage, it is very difficult to go back and change something that was not well designed in the concept stage. There's also nothing to show and tell the client as you go along. You complete the project with a big fanfare and pray the client likes it. That's potentially very risky.

Waterfall is generally regarded with some disregard within agencies as an inefficient and passé traditional project management approach. But Waterfall can be a useful and predictable approach if requirements are fixed, well documented and clear, the technology is understood and mature, the project is short, and there's no additional value gained from 'going agile'. A waterfall approach can actually provide more predictable end result for budget, timeline and scope.

Waterfall projects are suited for projects where you're working with other organizations or remote workers, a fixed scope, time and budget, smaller, well-defined and simpler projects and with an absent client (Haworth, 2017).

2.10 Project Management Tools

Project management is a difficult activity with numerous complex responsibilities. Fortunately, there are many tools available to assist with accomplishing the tasks and executing the responsibilities. Some require a computer with supporting software, while others can be used manually. Project managers should choose a project management tool that best suits their management style. No one tool addresses all project management needs. Program Evaluation Review Technique (PERT) and Gantt Charts are two of the most commonly used project management tools.

- **PERT**

A technique for estimating that applies a weighted average of optimistic, pessimistic, and most likely estimates when there is uncertainty with the individual activity estimates (PMBOK, 2013).

PERT provides the following information: expected project completion time, probability of the project completion before specified date, the critical path activities that directly impact the completion time, the activities that have slack time and that can lead to critical path activities and activity start and end dates.

- **Gantt Chart**

  A bar chart of schedule information where activities are listed on the vertical axis, dates are shown on the horizontal axis, and activity durations are shown as horizontal bars placed according to start and finish dates .It is used for two critical stages of Project life cycle: planning and tracking. (PMBOK,2013).

  The most common project management actions performed using Gantt chart are visualize schedule, assign due dates to tasks, assign staffs to tasks, identify the critical path and track progression of work items.

2.11 IT Project Management challenges

In the process of ITPM, IT project manager faces some unique challenges in whatever cases, excellent project management skills are essential to successfully dealing with the unexpected challenges that come with every project.

Rosberg (2008) summarized ten IT challenges as Globalization**,** Excess Workload, Talent, Change,On-time Performance and Quality, Outsourcing and Off Shoring, Project Management (Quality of Fact),Meeting Customer Expectation (Quality of Perception) and Planning**.**

Managing projects of all sizes and levels of complexities is part of the business, regardless of what vertical industry one manages. Managing software development projects might be tougher task because the constantly changing software development technologies and many more.

Doraiswamy & Shiv (2012) identified 50 challenges facing today's IT project manager and the major challenges are summarized as follows: unclear and missed requirements, poor planning, undefined roles and responsibilities, insufficient skills within the team, scope creep**,** unclear risks management issues, poor communication between teams, not using project management software, delay in document approval ,older legacy systems issues, unclear quality criteria ,lack of project management practices ,lack of suitable project management methodology ,too much project status reporting and meeting issues, insufficient technical knowledge within team and unclear change management process. According to the Ethiopian Information Technology professionals Association report on the growth of information technology, most of the IT projects in Ethiopia highly affected by the skills of the IT

professionals which is resulted from lack of academic institutions, weak education infrastructure and lack of trainings (EITPA,2015).

Chapter Three

Research Methodology

The primary objective of the E-Procurement Software development project is to develop, implement and support a web based electronic public procurement system to automate the various stages of purchasing in MCIT from the initial identification of a requirement, through the tendering process, to the contract management in a common technological platform. In order to assess the practice and challenges of ITPM in the case of E-Procuremenent software project of MCIT, I used the following methodologies.

3.1 Study Design

A research design is simply the framework or plan for a study that is used as a guide in collecting and analyzing the data as well it is a blueprint that is followed in completing a study. This project which regarded as a general survey is descriptive in nature, which includes findings from questionnaires and in-depth interview questions. It is concerned in assessing the practices and challenges in Information Technology Project Management of MCIT in case of E-Procurement software project.

Qualitative and Quantitative researches are not alternatives. Rather than thinking of qualitative and quantitative strategies as incompatible, they should be seen as complementary (Mahamoud, 2004). According to Saunders (2009), mixed methods approach is important when both quantitative and qualitative data collection techniques and analysis procedures are used in a research design. Therefore the researcher employed mixed method approach with a high emphasis on the qualitative approach. Both qualitative and quantitative data are collected and analyzed.

3.2. Data source

Responses of questionnaire and interview result served as data source of this study. Since this study focuses on the ITPM practices of MCIT in the e-procurement software project which is outsourced to Perago, the data obtained from published and unpublished sources related to the topic of this study

such as books and other related publications and literature which used as secondary sources. The primary data gathered through questionnaire and interview questions.

3.3. Population

This research is centered on the E-procurement software development team (from Perago i.e 15 in number) , the project management team (from MCIT i.e 6 in number) and considered the practice and the challenges of E-procurement software project experienced.

Online questionnaire were distributed among all MCIT and Perago project management team members and interview were conducted for both project managers of MCIT and Perago .Hence, the above listed were our population of this project.

3.4. Sample size and Sampling Techniques

For this thesis project, purposive sampling is used to pick the sample from Project managers, consultants and team members who are involved directly in E- Procurement Software Project both from MCIT and Perago. Purposive sampling is a widely used sampling method which allows a researcher to get information from a sample of the population that one thinks knows most about the subject matter. In this type of sampling, the choice of the sample items depends exclusively on the judgment of the investigator. Purposive sampling techniques include hand picking of the subject cases that the researcher thinks that possesses rich information to accomplish the researchers' objective. In order to get detailed and brief information about the issue, the research project has used six members of the project management team including the project manager from MCIT and fifteen project management team members from the outsourced company in addition to the project manager from Perago.

3.5. Data collection instrument

In this study the data collected from both primary and secondary data. The primary data collected through self developed structured questionnaire Likert scale for the project process groups and an adapted structured questionnaire in Likert scale for the major challenges of IT projects (Doraiswamy & Shiv 2012) were distributed among six team members of the project management team including

the project manager from MCIT and fifteen project management team members from Perago, the outsourced company including the project manager. Also interview conducted for two project managers of MCIT and Perago. Secondary data collected from Terms of Reference and Status report Documents. Also, both qualitative and quantitative approaches were employed in order to collect the data. The validity of the items in the questionnaire is reviewed by two project managers in IT sector. Then the researcher incorporates the views of those experts and made the necessary improvements.

3.6. Data analysis and interpretation

The data collected from the respondents both from questionnaire and interview were listed, grouped, and analyzed and finally interpreted. The data collected from the questionnaire interpreted by deploying statistical methods and techniques through Google form and Microsoft Excel. In addition, the consistency and accuracy of the data were checked before it was tabulated. **Google forms** are widely used to create surveys easily and quickly since they allow you to plan events, ask questions to your employees or clients and collect diverse type of information in a simple and efficient way. **Google forms** allow us to include different types of questions such as short answers, paragraphs, multiple selection, verification boxes, pull-down, linear scale, grid of several options, among others (Guay,2018). Advantages of using Google forms are it is a free online tool that allows us to collect information efficiently, help us create surveys in few minutes, the interface is easy to use, stores the feedback received so that it can be easily analyzed, integrated with Google spreadsheets so that the collected data be accessed in spreadsheet view and can be attached via email (advantages and disadvantages of Google forms|Datascope,2018).

The researcher chose this tool because of its ease of design and accessibility, it can easily be distributed and collected the data and analyze the responses. In addition, the researcher urged to use this tool because there was a high time limitations factor in which the respondents were busy in another duty.

3.7. Ethical Consideration

The goal of moral philosophy in research is to ensure that no one is harmed or suffers on the adverse consequences of the research activities. Thus, the ethical issues need to be studied in a scientific research were also weighed in this survey. The study results depend on the data supplied by the

respondents so the researcher asked for the consent of the interviewees and pledged to maintain the confidentiality of the data collected to guide this work, as well, the researcher will be liable for any consequences to respondents due to their participation in this research.

Chapter Four

Analysis and Presentation of data

4.1 Analysis Discussion and Results

The collected data from the questionnaire respondents are used to assess the Project Management Practice and Challenges of MCIT in case of E-Procurement software project and was analyzed using Google Form and Microsoft Excel. The Likert Scale used in the questionnaire and the percentage of the responses is analyzed by using Google form and Ms Excel.

The questionnaire was divided into two sections. In the first section, it is concerned with the project management practice based on project management process group. The second section is concerned with and challenges and the extent of those challenges affecting the project.

The respondents were all project management team members of MCIT and fifteen members from project implementing organizations which includes the project managers, Analysts and team members. The completed answers were collected online. Twenty one questionnaires (six to MCIT team members including the project manager and fifteen to the project management teams of the outsourced PLC ,Perago with the project manager) were sent for the MCIT Project management team members and all are responded. Furthermore, an interview was conducted with a project manager of MCIT and Perago. A sample of the Questionnaire and the semi structured interview questions both MCIT and Perago are attached at Appendix 1 ,2 and 3 respectively.

4.2 Assessing the ITPM Practice in terms of Project Management Process Groups

4.2.1 ITPM Practice in Project Initiation Process Group

According to PMI, the initial scope is defined, the initial financial resource is committed and the internal , external stakeholders who will interact and influence the overall outcome of the project are identified and the project manager is assigned to the project.

4.1 ITPM Practice in Project Initiation Process Group

No	Project Initiation Process Group	Interpretation	Percent	Mean	SD
1.	**Initial Scope (Time ,Budget and Quality) are developed**	Strongly Agree	57%	4.28	1.07
		Agree	28%		
		Neither	5%		
		Disagree	5%		
		Strongly Disagree	5%		
2.	**Basic Requirements are identified**	Strongly Agree	86%	4.86	0.35
		Agree	14%		
		Neither	-		
		Disagree	-		
		Strongly Disagree	-		
3.	**Key Stakeholders identified**	Strongly Agree	71%	4.7	0.45
		Agree	29%		
		Neither	-		
		Disagree	-		
		Strongly Disagree	-		
4.	**Competent Project manager is Assigned.**	Strongly Agree	57%	4.57	0.49
		Agree	43%		
		Neither	-		
		Disagree	-		
		Strongly Disagree	-		
5.	**Feasibility Study was conducted**	Strongly Agree	48%	3.14	1.81
		Agree			
		Neither	-		
		Disagree	24%		
		Strongly Disagree	28%		

Source: Own Survey, 2018

Questions under table 4.1 sought to determine that almost all the activities of the initiation process group are performed. From the above table, the mean score and standard deviation for almost all activities under initiation process group indicates that they are completely achieved whereas the mean score and standard deviation for the study of feasibility 3.14 and 1.81 respectively revealed that feasibility study were not done fully at first MCIT.

From the interview results revealed that the following activities were performed in the project initiation process group. Those activities were the initial scope with respect to time ,budget and quality were developed ,a detailed project requirements were identified by MCIT, key stakeholders were identified and a project manager was assigned. The project management team went to India to have international experience and at least to prepare the basic requirement and initial scope. But the feasibility study conducted by the software development company: Perago after it has awarded the bid.

In other hand, the Perago project manager replied in the interview that after they have awarded the bid, they conducted project kick off meeting which covered high level overview of the statement of work, review project stages/methodologies (describe how to run the project), defined the project team (not all), discuss risk, issues and change management (brief description) and high level project plan review.

4.2.2 ITPM Practice Project Planning Process Group

The Planning Process group consists of those processes performed to establish the total scope of the effort, defined and refined objectives and developed the course of action required to obtain those objectives. The planning process develops the project management Plan and the project Documents that will be used to carry out the project.

Table 4.2 ITPM Practice in Project Planning Process Group

No	Project Planning Process Group	Interpretation	Percent	Mean	SD
1.	**Project Time Management Plan is prepared**	Strongly Agree	86%	4.86	0.35
		Agree	14%		
		Neither	-		
		Disagree	-		
		Strongly Disagree	-		
2.	**Project Cost Management Plan is prepared**	Strongly Agree	76%	4.76	0.43
		Agree	24%		
		Neither	-		
		Disagree	-		
		Strongly Disagree	-		
3.	**Project Quality Management Plan is prepared**	Strongly Agree	48%	4.48	0.5
		Agree	52%		
		Neither	-		
		Disagree	-		
		Strongly Disagree	-		
4.	**Project Communication Management Plan is prepared**	Strongly Agree	16 76%	4.76	0.43
		Agree	5 24%		
		Neither	-		
		Disagree	-		
		Strongly Disagree	-		
5.	**Project Risk management Plan is prepared**	Strongly Agree	14%	4.14	0.35
		Agree	86%		
		Neither	-		
		Disagree	-		
		Strongly Disagree	-		

6.	**Scope Management Plan is prepared**.	Strongly Agree	71%	4.71	0.45
		Agree	29%		
		Neither	-		
		Disagree	-		
		Strongly Disagree	-		

Source: Own Survey, 2018

From the above table, almost all of the respondents believed that Project Time Management Plan ,Project Cost Management Plan, Project Quality Management Plan, Project Communication Management Plan , Project Risk management Plan and Scope management Plan are prepared. The Mean score and standard deviation also support the above summarization.

The MCIT project manager replied in the interview that the project team of the MCIT had prepared an initial plan on the budget, schedule, communication, risk and quality. But their plan was used to develop a TOR for the bid. MCIT employed PERT in order to identify expected project completion time, probability of the project completion before specified date, the critical path activities that directly impact the completion time, the activities that have slack time and that can lead to critical path activities and activity start and end dates.

In other hand, the Perago project manager replied in the interview that after they have awarded the bid, they prepared an inception report which includes a detailed plan of the project budget; timelines for all tasks identified and by sequencing the various activities according to milestones and deadlines, allocation of resources to all tasks and also the project schedule includes the work breakdown structure for the all the phases / activities of the project; prepared the overall logistics requirements in terms of hardware and software; the anticipated risks, the source of the risk, impact on the project, categorization of risk and how to avoid or mitigate these risks, responsible person to take action for mitigation; the communication plan prepared which include how the project progress and issues will be communicated, how often, and by which means, the project progress status to MCIT or a technical committee assigned to over look the progress of the project on a periodic basis. Perago used Gantt charts as project management tool in order to visualize schedule, assign due dates to tasks, assign staffs to tasks, identify the critical path and track progression of work items.

4.2.3 ITPM Practice Project Execution Process Group

The Executing Process Group consists of those processes performed to complete the work defined in the project management plan to satisfy the project specifications. This Process Group involves coordinating people and resources, managing stakeholder expectations, as well as integrating and performing the activities of the project in accordance with the project management plan.

Table 4.3 ITPM Practice in Project Execution Process Group

No	Project Execution Process Group	Interpretation	Percent	Mean	SD
1.	**The development team brings the deliverables as stated in the requirement plan**	Strongly Agree	48%	4.48	0.5
		Agree	52%		
		Neither	-		
		Disagree	-		
		Strongly Disagree	-		
2.	**Deliverables are presented based on the their Milestones**	Strongly Agree	57%	4.57	0.5
		Agree	43%		
		Neither	-		
		Disagree	-		
		Strongly Disagree	-		
3.	**The development team delivered the status report as planned.**	Strongly Agree	52%	4.52	0.5
		Agree	48%		
		Neither	-		
		Disagree	-		
		Strongly Disagree	-		

Source: Own Survey, 2018

Table 4.3 Summarized the ITPM practice in execution project process group. The mean value and standard deviation revealed that the development team brings the deliverables as stated in the

requirement plan, deliverables are presented based on the Milestones, the development team delivered the status report as planned **,**and the development team delivered the status report as planned**.**

As the MCIT project manager replied, there was no problem regarding to the product to be delivered. The development team delivered the deliverables which includes inception report, System requirement Specification Document(SRS), System Analysis and Design Document, Software package with source code, Hardware, status report, Software & Database Installation Procedures, Test Cases and Reports, User manuals , and Project Closure Report were delivered as identified and described in the planning phase. Even though the estimated duration on giving a comment for each deliverables and give a feedback for the development team was ten days but the project management team sometimes took 20 to 30 days which in turn have an effect on the deviation of the schedule. After all the feedbacks are given on the deliverables ,the development company will do all the improvements and forward it back to the project management team of MCIT, if they agree they will all sign on it. Then the Perago will take the signed document to inquire payment for the deliverable. Again all the beaurcratic nature of the checking process will have an effect an effect on deviation of the schedule. Both the project managers assured that they have used the same project management methodology i.e. traditional waterfall method. Since *Waterfall* is a linear approach to software development, each of the deliverables represents a distinct stage of software development, and each stage generally finishes before the next one can begin.

4.2.4 ITPM Practice in Project Monitoring and Evaluation Process Group

The monitoring and evaluation process group consists of those processes required to track, review and arrange the progress and performance of the project; identify any areas in which changes to the plan are required; and initiate the corresponding changes. The key benefit of this process group is that project performance is measured and analyzed at regular intervals, appropriate events, or exception conditions to identify variances from the project management plan.

Table 4.4 ITPM Practice in Project Monitoring and Evaluation Process Group

No	Project Monitoring and Evaluation Process Group	Interpretation	Percent	Mean	SD
1.	Change Requests are reviewed approved.	Strongly Agree	38%	3.8	1.22
		Agree	33%		
		Neither	-		
		Disagree	29%		
		Strongly Disagree	-		
2.	Completed project deliverables acceptance is formalized.	Strongly Agree	67%	4.33	1.17
		Agree	19%		
		Neither	-		
		Disagree	9%		
		Strongly Disagree	5%		
3.	Project Scope is monitored/ updated and changes to scope baselines are managed.	Strongly Agree	48%	4.19	1.01
		Agree	38%		
		Neither	-		
		Disagree	14%		
		Strongly Disagree	-		
4.	Project Progress is monitored/ updated and changes to schedule baselines are managed.	Strongly Agree	38%	3.80	1.22
		Agree	33%		
		Neither	-		
		Disagree	29%		
		Strongly Disagree	-		
5.	Project budget is monitored/ updated and changes to cost baselines are managed.	Strongly Agree	62%	4.62	0.49
		Agree	38%		
		Neither	-		
		Disagree	-		
		Strongly Disagree	-		
6.	Quality activities are monitored and results are recorded to assess	Strongly Agree	76%	4.76	0.43
		Agree	24%		
		Neither	-		

	performance and to recommend necessary changes.	Disagree	-		
		Strongly Disagree	-		
7.	**Performance Information like status reports, progress measurements and forecasts are collected and distributed.**	Strongly Agree	52%	4.19	1.01
		Agree	29%		
		Neither	9%		
		Disagree	5%		
		Strongly Disagree	5%		

Source: Own Survey, 2018

Table 4.3 summarized the ITPM Practice in Monitoring and Evaluation process group .In this project process group ,the Mean score and standard deviation depicted that Completed Project deliverables acceptance is formatted, Project Scope is monitored/ updated and changes to scope baselines are managed, Project budget is monitored/updated and changes to cost baselines are managed, quality activities are monitored and results are recorded to assess performance and to recommend necessary changes, and performance information like status reports, progress measurements and forecasts are collected and distributed.

Whereas the Mean score for approval/renewal of Change Requests activity and monitoring/updating of the project progress and management of changes to schedule baselines Project Progress are less than the above activities. This is because most government Projects have fixed budget any major changes which will result in an additional cost is unacceptable.

From both interview results, it has grasped that the deliverables were fully accepted (only some minor change are entertained), the quality attributes were measured properly as regarding to usability, testability, security, availability, maintainability, scalability, modularity, supportability and dependency. The project progress report were presenting on those weekly meetings which are held

between the MCIT and Perago .The meetings that are held within the project management team whenever any deliverables delivered and there are any aspects that can be discussed and solved by the team, If not ,it will be forwarded back to Perago. Since the MCIT team didn't use any online tracking software rather they use email, phone, and meetings with in the management team and the development team in order to monitor and control the project status. When there is a necessary issue, the board management will be called for the meeting. And the communication style with the Perago, is once in a week for the Progress report (status report), they will conduct a meeting for each deliverables and on urgent cases, they will conduct a meeting even twice or three days a week. The Perago project manager explained that, the management control over the project by MCIT project team helped them (Perago) to manage the triple constraints - scope, schedule and cost effectively. And MCIT side, the different kinds of reports used as evaluation tools to track the project.

4.2.5 Project Closing Process Groups Practice

The Closing Process Group consists of those processes performed to conclude all activities across all Project Management Process Groups to formally complete the project, phase, or contractual obligations. This Process Group, when completed, verifies that the defined processes are completed within all of the Process Groups to close the project or a project phase, as appropriate, and formally establishes that the project or project phase is complete.

Table 4.5 ITPM Practice in Project Closing Process Group

No	Project Closing Process Group	Interpretation	Percent	Mean	SD
1.	**Lesson Learnt was properly documented.**	Strongly Agree	76%	4.76	0.43
		Agree	24%		
		Neither	-		
		Disagree	-		
		Strongly Disagree	-		
2.	**Training Manual both for**	Strongly Agree	90%	4.9	0.29
		Agree	10%		

	technical and operational were properly prepared.	Neither	-		
		Disagree	-		
		Strongly Disagree	-		

Source: Own Survey, 2018

Table 4.5 summarized the ITPM Practice in terms of project closing process group. In this process group, lesson learnt was properly documented and training manual both for technical and operational were properly prepared.

From both the interview results, the closure had conducted properly all the lessons learnt throughout the project life cycle had been identified and documented by the development team. The training manuals for both technical and operational were prepared and addressed. The mitigation plan for the risks encountered during the project were identified and documented. Perago prepared original project plan and the revised project Plan, work breakdown structure, minutes of each meeting, any project changes / all change requests and users acceptance form are documented.

4.3 Challenges of E-procurement Software Project Management

The interview results on the challenges affected the E-procurement analyzed as follows. Those challenges are occurred during the E-procurement software project life cycle of the MCIT.

As of the project managers of MCIT and Perago explanations on the main challenge that had occurred was the knowledge and skill gap among the project management team regarding as a result of high staff turnover the project and the project itself. That is, the skills among the newly appointed team member won't have equal skills with the already presented team members. Besides the skill gap was also observed in not knowing the business aspect of the software environment and the not having project management knowledge.

Another challenge for the implementation of the project was the resistance to the new system. The different federal ministry organization workers were very challenging in adaptation of the deploying system.

Due to the unstructured manual procurement process of the organization, the project was challenged while deploying. Also, the delay in checking and evaluating of deliverable in MCIT are also another challenging in completion of the project.

Results related to challenges from questionnaire also analyzed using means and standard deviation. The respondents were inquired questions related to the challenges under which they carried out the ITPM in the E-Procurement software project on a questionnaire. Different challenges were highlighted and for the purpose of analyzing the issues the researcher decided to categorized challenges under five groups such as: challenges associated with Planning Process, challenges associated with project management issues, challenges associated with the project management team, challenges related to Reporting and challenges related to the old legacy system and infrastructure.

4.3.1 Interpretations of findings

This section presents the descriptive statistics of challenges associated with ITPM of E-Procuremenent Software Project of MCIT. The main problem areas in ITPM were identified by comparing their mean and standard deviation between the respondents' agreement and disagreement on the issues associated with ITPM. The lower the mean score indicates the strength of respondents' disagreement over the issue. The higher the mean score indicates the strength of respondents' agreement over the issue. The higher the standard deviation implied that the wider the variation in responses and vice versa. The result of the analysis is presented in different tables below.

4.3.2 Challenges associated with the Planning Process

Table 4.6 Challenges associated with planning Process

No.	Challenges	Interpretation	Percent	Mean	SD
1.	Unclear and missed Requirements	Completely	5%	2.05	0.9
		Considerably	-		
		Moderately	14%		
		Slightly	57%		
		Not at all	24%		
2.	Undefined Roles and Responsibilities	Completely	29%	2.76	1.44
		Considerably	-		
		Moderately	-		
		Slightly	62%		
		Not at all	9%		
3.	Unclear risks management issues	Completely	-	1.86	0.89
		Considerably	5%		
		Moderately	19%		
		Slightly	33%		
		Not at all	43%		
4.	Unclear Quality Criteria	Completely	14%	2.33	1.49
		Considerably	10%		
		Moderately	19%		
		Slightly	10%		
		Not at all	47%		
5.	Unclear change management process	Completely	10%	2.43	1.29
		Considerably	10%		
		Moderately	28%		
		Slightly	19%		
		Not at all	33%		

Source: Own Survey, 2018

From the above table, as complete detail requirement identification has done prior the project execution began; we can see that only 5% of the respondents reported that the project was completely challenged by the unclear and missed requirements. Starting with unclear and missed requirements is like dealing with the unknown. And based on the criticality of unclear and missed requirement, there could be a significant loss to the project in terms of business benefits. 29% of the respondents replied that the project is completely affected by undefined roles and responsibilities of the team members this shows that the project was slightly affected by it. Also, the mean score for unclear risk management is 1.86 which the project was 57% affected by it . Keeping your project issues risks log up to date, along with actions, assumptions and dependencies is important in case of any project failure occurs.14% of the respondents were reported that unclear quality criteria has affected them completely. The mean score of unclear change management process is 2.43 demonstrates that it has a slight effect on the project.

Table 4.7 Challenges associated with overall Planning

No.	Challenges	Interpretation	Percent	Mean	SD
1.	Poor Planning	Completely	14%	2.52	1.33
		Considerably	14%		
		Moderately	-		
		Slightly	54%		
		Not at all	18%		

Source: Own Survey, 2018

From the above table, the responses of the questionnaires indicate that only 14% of the respondents replied that the project is completely affected by overall poor planning. The reason why the project has slightly affected by the above challenges related to planning because the project time management, Project cost management, Project risk management plan and Scope management plan has properly prepared in the planning process group of the project.

4.3.3 Challenges associated with project management issues

Table 4.8 Challenges in Project Management

No	Challenges	Interpretation	Percent	Mean	SD
1.	Scope creep	Completely	-	2.24	0.81
		Considerably	-		
		Moderately	47%		
		Slightly	29%		
		Not at all	24%		
2.	Not using project management software	Completely	24%	2.1	1.66
		Considerably	-		
		Moderately	-		
		Slightly	14%		
		Not at all	62%		
3.	Lack of suitable Project Management Methodology	Completely	23%	2.62	1.62
		Considerably	10%		
		Moderately	10%		
		Slightly	19%		
		Not at all	38%		
4.	Lack of project management practices	Completely	23%	2.24	1.66
		Considerably	-		
		Moderately	10%		
		Slightly	10%		
		Not at all	57%		

Source: Own Survey, 2018

The respondents were asked their opinion towards the challenges related to project management process. The respondents reported that the project wasn't highly affected by Scope creep which is observe from the mean score of 2.24 and standard deviation of 0.81.Scope creep occurs when project management allows the project's scope to extend beyond its original objectives. Scope creep is one of the top five reasons why a project can fail (Doraiswamy & Shiv ,2012). It causes increased cost, effort and time. The questionnaire result shows that the project was slightly affected by lack of using project management software, lack of suitable project management methodology and lack of project management practices. Project management methodology should be properly chosen and strictly followed in order to accomplish the project as per the specification, on time, to avoid failure, and also to reduce risks. The lack of processes, not having an inflection to revisit the project status of every activity with the stakeholders, or the lack of open lines of communication to break down silos are challenges to put IT project management in practice in too many organizations.

Both MCIT and Perago used waterfall as project management methodology but MCIT had not used any project management software at all both in managing and also in tracking of the project. But, Perago had used MS project software.

4.3.4 Challenges associated with project management teams

Table 4.9 Challenges related with Project Management Teams

No	Challenges	Interpretation	Percent	Mean	SD
1.	Insufficient Project Management skills within the team	Completely	29%	3.33	1.52
		Considerably	33%		
		Moderately	-		
		Slightly	19%		
		Not at all	19%		
2.	Poor communication between teams	Completely	10%	2.38	1.32
		Considerably	19%		

		Moderately	-		
		Slightly	42%%		
		Not at all	29%		
3.	Insufficient Technical Knowledge within team	Completely	33%	3.43	1.47
		Considerably	24%		
		Moderately	10%		
		Slightly	19%		
		Not at all	14%		

Source: Own Survey, 2018

Table 4.9 depicts the challenges that are related to the project management team members. 62% of the respondents reported that the insufficient skills within the team affected the project. These skills are related to project management, problem solving and problem analytical ability. Only 29% of them believed that poor communication between teams affect of the proper execution of the project. According to Project Management Institute's Pulse of the Profession survey (2017,p23), almost a third of all project failures were due to poor communication. One of the biggest challenges as an IT project manager is trying to collaborate with different teams. All this can make the whole process very ineffective. Project managers provide direction at every step of the project, so each team leader knows what's expected. Involvement of every member in the project is very advantageous in order to accomplish the project as planned. 57% of the respondents said that there was insufficient technical knowledge within the team. The major difficulties that occurred due to insufficient Technical Knowledge are inability of the person to validate the estimates provided, they get left out on the technical discussions, and they are not able to provide any further value-add to the team, other than the basic discussions. This, in turn, leads to a lack of respect amongst peers and subordinates. Proper communication can help increase morale by establishing clear expectations among the team members. From the mean and standard deviation of the above challenges that are related to the project management team both in MCIT and Perago can conclude that these challenges were highly affect the project.

4.3.5 Challenges associated with Reporting

Table 4.10 Challenges associated with Reporting

No	Challenges	Interpretation	Percent	Mean	SD
1.	Delay in Document approval	Completely	47%	3.85	1.46
		Considerably	24%		
		Moderately			
		Slightly	19%		
		Not at all	10%		
2.	Too much Project Status Reporting Issues	Completely	24%	3.05	1.33
		Considerably	10%		
		Moderately	24%		
		Slightly	32%		
		Not at all	10%		

Source: Own Survey, 2018

From the above table, delay in document approval is highly affecting the project with the mean score of 3.85 and almost 71% of the respondents' agreed. In the project, there was higher degree of document approval delay from the side of MCIT. From the responses, we can see that Project managers spent most of their time in meetings and preparing status reports. Number of deliverables/documents created during the project lifetime. It was a huge challenge to get all these deliverables organized, shared with reviewers, reworked based on review comments, approved by clients, and baselined in the document repository. The problem associated with this issue is that especially project team members from MCIT failed to deliver their review comments on the due date so in order to accommodate them the project work will be delayed. Almost 90% of the respondents (though the extent differs) reported that. too much project status reporting issues challenged the project with high point.

4.3.6 Challenges associated with old legacy Systems issues

Table 4.11 Challenges associated with old legacy Systems issues

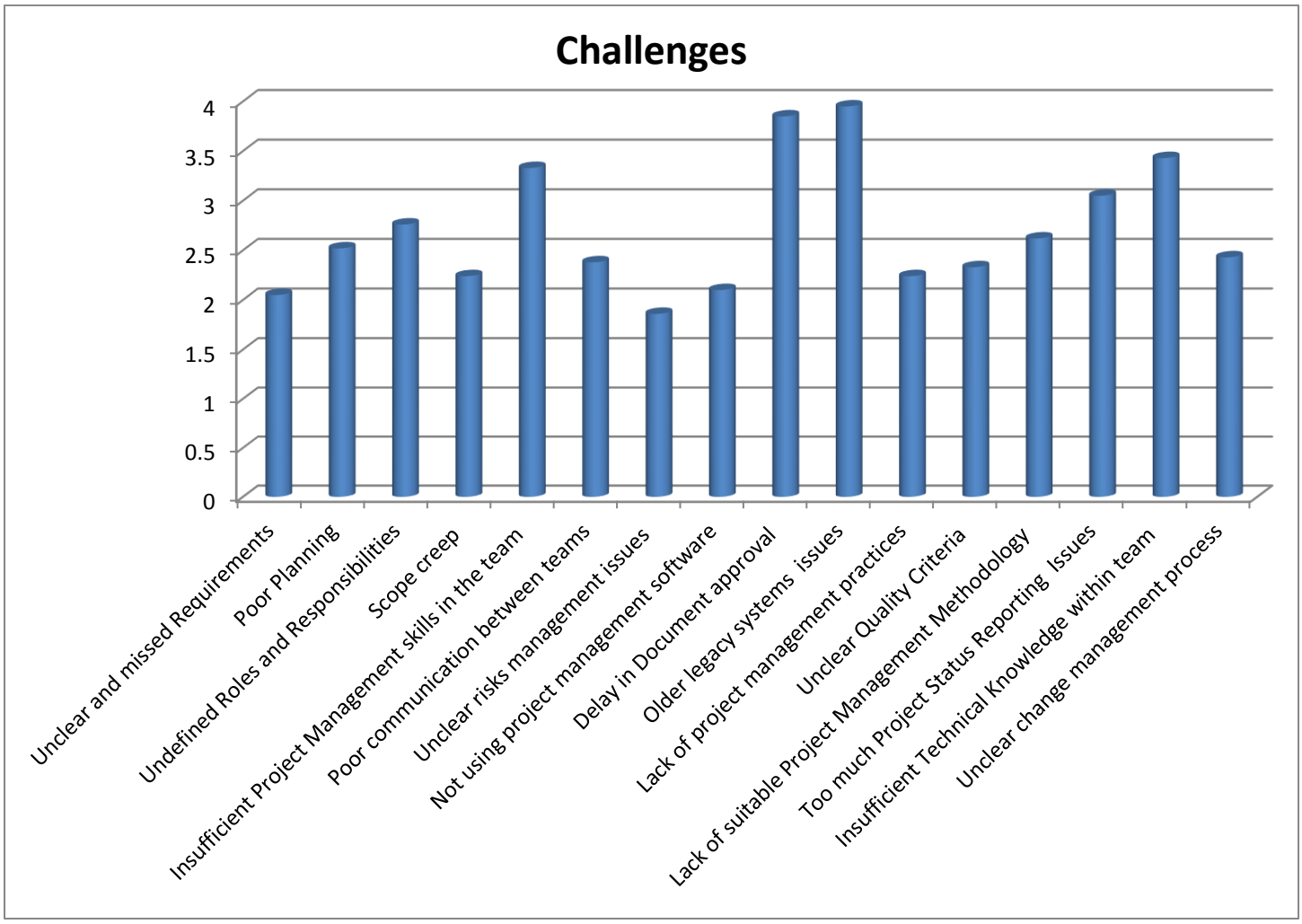
No	Challenges	Interpretation	Percent	Mean	SD
1.	Older legacy systems	Completely	38%	3.95	0.99
		Considerably	29%		
		Moderately	23%		
		Slightly	10%		
		Not at all	-		

Source: Own Survey, 2018

From the above listed challenges, older legacy systems took the lion share with mean score of 3.95. Almost all of the respondents gave their agreement on it. From the responses of both the project management team members and also the outsourced company, Perago were highly challenged by the unstructured manual system of Procurement in government organizations.

4.4 Extent that the challenges affect the effective project management process

Figure 1: Major Challenges of ITPM of E-Procurement Software Project of MCIT



Source :Own Survey (2018)

As presented from Figure 1, the extent of the effect of each challenge on the project are clearly depicted .In order to measure the extent, the mean score of each challenges are used. The highest the mean , the higher the extent of the challenge.

The results of the questions on the challenges has presented in the above figure. Also the extents of major challenges of the E-procurement project of MCIT are shown in the figure by the mean results. Based on the above figure there are five challenges that majorly affect the execution of the E-procurement project are the older legacy systems of the government organizations, delay in Document

approval, insufficient Technical Knowledge within team members, insufficient team skills, and too much Project Status Reporting Issues.

4.5 Limitation of the study

Because of shortage of time and resources, this study unable to cover all government and private projects. It focused only on E-Procurement Project of MCIT. The most pressing problem that encountered the researcher in the course of conducting this research work is that the respondents have taken too much time to fill the questionnaires because they were involved in different activities.

Chapter Five

Conclusions and recommendations

5.1 Introduction

As outlined in chapter one, the primary aim of this Research project is to assess practices and challenges of ITPM E-Procurement Software Project of MCIT. This chapter pursues to situate the findings from chapter four in to the context of the aim and objectives, which represent the original motivation of the study.

The next sub section presents summary of findings, concluding statements and then recommendations.

5.2 Summary of Findings

5.2.1 ITPM Practice Findings Summary

Concerning the practice of Information Technology Project Management practices of the project with respect to initiation, planning, execution, monitoring/control, and closing process groups and summarized as follow:

- Some activities were conducted during the initial stage of the project. The initial Scope (Time, Budget and Quality) of the project had developed, the basic requirements of the project were identified, the key stakeholders were identified and also the project manager was assigned during the first phase of the project by the ministry organization, MCIT. Whereas, the feasibility study was conducted by the development team. Also the Software development company conducts a kick-off meeting.
- The ITPM practice in planning process group: the MCIT prepared Project Time Management Plan, Cost Management Plan, Project Quality Management Plan, Communication Management Plan and Project Risk management Plan. But all these plans are used as an initial to prepare TOR. Also Perago prepared an inception report with detail planning and also they conducted the feasibility study.

- The ITPM practice in Project Execution Process Group: the development team of Perago brought the deliverables as stated in the requirement plan and the development team delivered the status report as planned. But deliverables were not presented based on their Milestones. Also project management methodology used was traditional waterfall method.
- ITPM Practice in Project Monitoring and Evaluation Process Group: Completed project deliverables acceptance is formalized, Project Scope was monitored/ updated and changes to scope baselines were managed, and Project Progress was monitored/ updated quality activities are monitored and results are recorded to assess performance and to recommend necessary changes ,and Performance Information like status reports, progress measurements and forecasts are collected and distributed. Where as, Change Requests were not reviewed and approved because there were no major changes and Project budget were not monitored/ updated since project budget was fixed.
- ITPM Practice in Project Closing Process Groups Practice: Lesson Learnt was properly documented. And, both technical and operational training manuals were properly prepared.

5.2.2 Challenges Findings Summary

- Unclear and missed requirements,
- Poor Planning,
- Undefined Roles and Responsibilities,
- Insufficient skills within the team,
- Scope Creep**,**
- Unclear Risks Management Issues,
- Poor Communication between teams,
- Lack of using **P**roject Management Software,
- Delay in document approval ,
- Older Legacy Systems Issues,
- Unclear Quality Criteria,
- Lack of Project Management Practices,
- Lack of suitable project management methodology,
- Too much Project Status Reporting and meeting issues,

- Insufficient technical knowledge within team, and
- Unclear change management process.

Generally, the above listed points affected the execution of the E-procurement project of MCIT. But, the project was mainly affected by the five of the listed challenges. Those are the older legacy systems of the government organizations, delay in Document approval, insufficient Technical Knowledge within team members, insufficient team skills, and too much Project Status Reporting Issues.

5.3 Conclusion

The aim of this research project is to assess the practice and challenges of the E-procurement project of the MCIT that is outsourced to a software development Organization, Perago. And, also recommending the remedial mechanisms to challenges they face is the researcher ultimate objective. Conclusion of the research findings discussed next.

MCIT played the project management role in the way of monitoring, controlling and evaluation. They gathered an international experience to initiate and formalize the project and also they prepared detailed requirement in order to prepare the TOR. The project management practice of the E-procurement project that has been almost fully performed in each process group. But, some limitations had observed: feasibility study hadn't been conducted by MCIT at the initial stage, and also delaying in document approval.

As the result of this research project, the E-procurement project faced with the following challenges: unclear and missed requirements, poor planning, undefined roles and responsibilities, insufficient skills within the team, scope creep**, u**nclear risks management issues, poor communication between teams, using **p**roject management software, delay in document approval, older legacy systems issues, unclear quality criteria, lack of project management practices, lack of suitable project management methodology, too much Project Status Reporting and meeting issues, insufficient technical knowledge within team, and unclear change management process.

The project execution process of the MCIT E-procurement project had majorly affected by the older legacy systems of the government organizations, delay in document approval, insufficient technical knowledge within team members, insufficient team skills, and too much project status reporting issues, chronologically. The chronological order illustrates the extent of the challenges in sequential order.

5.4 Recommendations

The following recommendations are proposed for the challenges that highly affecting the E-Procurement Software Project:

- The feasibility study should be conducted in order to establish the validity of the benefits of the project locally by MCIT.
- Projects are temporary endeavor that are developed or originated in order to solve problems or support the existing system. So, the different government organizations should prepare a suitable environment for the development of projects. This will help the development team to understand and to design the best solution for the existing unstructured system.
- In order to minimize the time wasted on the approval for each deliverables, the project team members better to prepare a project management team members meeting after each deliverables. In these meetings, the team can walk through the document with the reviewer and make amendments at the same time. At the end of the workshop, make sure the approver signs on the dotted line.
- So as to deal with insufficient Technical Knowledge within team members and insufficient team skills, have a training plan for team members and frequently keep them updated with the latest technologies. Also project management training can help project team members to improve their ability of managing project, solving and analyzing a problem.
- To overcome the challenge of too much project status reporting issues use tools like softwares to generate the report easily and also delegate a person who deals with status report preparation to the team.

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Annexes

APPEDIX I

IT project management practices and challenges in case of ministry of information and Technology, E-procurement software project.

This questionnaire was prepared by Addiskidan Missker for conducting survey on IT project management practices and challenges in case of ministry of information and Technology, E-procurement software project. This research is used as an impartial fulfillment of Masters in project Management at Addis Ababa University, College of Business and Economics, School of Commerce under the supervision and advice of Dr. Abdurazak Mohammed. The information gathered is anonymous and will remain strictly confidential. It will be used only to advance knowledge and for the dissemination of the overall results at academic or professional forums. Only the researchers will have access to the data collected. Completing this questionnaire will be considered as your consent to participate in our research project and permission to use the data collected from this questionnaire in future research. The online web server confidentiality policies stipulate that all information collected will be kept confidential.

I. Demographic Information

1. Your Age

   19-25 ☐ 25-36 ☐ 36-42 ☐ 42-50 ☐ >50 ☐

2. Gender

   Male ☐ female ☐ prefer not to say ☐

3. Please specify your Educational Qualifications

   Undergraduate ☐ College Diploma ☐ Bachelor Degree ☐ Post Graduate: Masters ☐ Post Graduate: PhD or more ☐

II. Project management Process groups

No	Project Initiation Process Group	Responses				
		Strongly	Agree	Neither	Disagree	Strongly

		Agree				Disagree
1.	Initial Scope (Time ,Budget and Quality) are developed					
2.	Basic Requirements are identified					
3.	Key Stakeholders identified					
4.	Competent Project manager is Assigned.					
5.	Feasibility Study was conducted					
Project Planning Process group						
1.	Project Time Management Plan is prepared					
2.	Project Cost Management Plan is prepared					
3.	Project Quality Management Plan is prepared					
4.	Project Communication Management Plan is prepared.					
5.	Project Risk management Plan is prepared					
6.	Scope Management Plan is prepared.					

Project Execution Process Group						
1.	The development team brings the deliverables as stated in the requirement plan					
2.	Deliverables are presented based on the their Milestones					
3.	The development team delivered the status report as planned.					
Project Monitoring and Evaluation Process Group						
1.	Change Requests are reviewed approved.					
2.	Completed project deliverables acceptance is formalized.					
3.	Project Scope is monitored/ updated and changes to scope baselines are managed.					
4.	Project Progress is monitored/ updated and changes to schedule baselines are managed.					
5.	Project budget is monitored/ updated and changes to cost baselines					

	are managed.					
6.	Quality activities are monitored and results are recorded to assess performance and to recommend necessary changes.					
7.	Performance Information like status reports, progress measurements and forecasts are collected and distributed.					
Project Closing Process Groups Practice						
1.	Lesson Learnt was properly documented.					
2.	Training Manual both for technical and operational were properly prepared.					

III. Major Challenges of the Project

No	Challenges	Responses			
		Significantly	**Moderately**	**Slightly**	**Not at all**
1.	Unclear and missed Requirements				
2.	Poor Planning				
3.	Undefined Roles and Responsibilities				

4.	Scope creep				
5.	Insufficient skills within the team				
6.	Poor communication between teams				
7.	Unclear risks management issues				
8.	Lack of using project management software				
9.	Delay in Document approval				
10.	Older legacy systems				
11.	Lack of project management practices				
12.	Unclear Quality Criteria				
13.	Lack of suitable Project Management Methodology				
14.	Too much Project Status Reporting and meeting issues				
15.	Insufficient Technical Knowledge within team				
16.	Unclear change management process				

Adopted from Doraiswamy & Shiv (2012).

THANK YOU FOR YOUR COOPERATION

APPENDIX II

INTERVIEW QUESTIOS FOR PROJECT MANAGER OF MCIT

1. How do you describe the project generally?
2. What are the project's major milestones, deliverable and the target dates for delivery?
3. How project status reporting information will be used to monitor and control the project, and what are corrective actions identified as part of the reporting process?.
4. What are the final approval processes for each project deliverable?
5. What is your communication style with your team and challenges?
6. How do you track the project? Have you used a project management tracking software?
7. What do you think are the main challenges affecting your project management practice?
8. To what extent these challenges affect your project management practice?
9. How management controls over the project affect this project management?
10. What are the overall quality objectives established for the project? And how do you control quality?
11. Describe areas in your current project where there is a high level of uncertainty. How do you tackle these uncertainties?
12. How do you control changes to your project?

APPENDIX III

INTERVIEW QUESTIOS FOR PROJECT MANAGER OF Perago Information System

1. What is your current role within your organization?
2. How do you describe this project?
3. What is the nature of this Project?
4. How many end-users (including the organization's clients or customers) will directly interact with the system delivered by THIS PROJECT?
5. What is the software development approach adopted for THIS PROJECT?
6. What is the estimated duration of THIS PROJECT?
7. What is the project scope? (The scope in these case defines project limits and identifies the products and/or services delivered by the project.)
8. How management controls (external oversight) over the project affect your project management?
9. What are the administrative and managerial liaisons between the project team and the primary Owner with which it interacts?
10. What are the overall quality objectives established for the project. (These quality objectives will be used to identify the quality standards by stating the desired end result. If quality objectives have been established at the organization or agency level for all projects, refer to the agency and/or organizational quality objectives. Include project specific quality objectives as needed.
11. What do you think are the main challenges affecting your project management practice ?
12. To what extent these challenges affect your project management practice?