



ADDIS ABABA UNIVERSITY

School of Commerce Distance Graduate Program

Project Management /MAPM/Unit

**Assessment of Management Roles Effectiveness for
Enterprise Resource Planning (ERP) System
Implementation Success: The Case of Ethiopian
Electric Utility (EEU) ERP Project.**

By: YohannesMulushoaGirma

August, 2019

Addis Ababa, Ethiopia



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By: Yohannes Mulushoa Girma
(GSD/1940/09)

Advisor: Abdurezak Mohammed (PHD)

**A Research Project Work Submitted to the School of Graduate Studies of
Addis Ababa University in Partial Fulfillment of the Requirement for Award
of Master of Arts in Project Management (MAPM)**

August, 2019

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By: YohannesMulushoaGirma

Approved by:

Abdurezak Mohammed (PHD)

Advisor

Signature and Date

MengistuBogale (PHD)

Internal Examiner

Signature and Date

Abdu M. (PHD)

External Examiner

Signature and Date

DECLARATION

I, Yohannes Mulushoa Girma, declare that the study entitled “Assessment of Management Roles Effectiveness for Enterprise Resource Planning (ERP) System Implementation Project Success: The Case of Ethiopian Electric Utility (EEU) ERP Project” is the result of my own effort and study that all sources of materials used for the study have been acknowledged. I have conducted the study independently with the guidance and comments of the research advisor. This study has not been submitted for any degree in any university. It is conducted for the partial fulfillment of the Master of Arts Degree in Project Management.

Yohannes Mulushoa Girma

Date

LETTER OF CERTIFICATION

This is to certify that Yohannes Mulushoa Girma has conducted this project work entitled “Assessment of Management Roles Effectiveness for Enterprise Resource Planning (ERP) System Implementation Project Success: The Case of Ethiopian Electric Utility (EEU) ERP Project” is under my supervision.

This project work is original and suitable for the submission in partial fulfillment of the requirement for the award of Master of Arts Degree in Project Management.

Abdurezak Mohammed (PhD) _____

Signature and Date

ACKNOWLEDGEMENT

First of all, I would like to thank the Almighty God who gave me strength and encouragement to complete the courses of this study. I am grateful to my family who had given a lot of encouragement and motivation to complete my study. I would also like to express my sincere appreciation to my advisor Dr. Abdurezak Mohammed for the guidance, assistance and constant support throughout this study. I also want to acknowledge all organizations and individuals of the Ethiopian Electric Utility who gave me data and materials. Last but not least, to those who had contributed assistance, either directly or indirectly, yet their names are not cited here, they deserve my greatest gratitude.

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Lists of Acronyms

CSFs	Critical Success Factors
DSS	Decision Support System
EEP	Ethiopian Electric Power
EEU	Ethiopian Electric Utility
ERP	Enterprise Resource Planning
IT	Information Technology
ICT	Information Communication Technology
SPSS	Statistical Package for Social Sciences

Abstract

This case study is conducted in Ethiopian Electric Utility (EEU) to assess Enterprise Resource Planning (ERP) implementation success based on Management Roles effectiveness. Thus the study; by adapting previous research work that tried to group related Critical Success Factors (CSFs) into five Management Roles, developed a research framework that associate the management role effectiveness with the ERP implementation success; and also by using various data collection methods (qualitative and quantitative) in combination with purposive sampling technique to select 167 samples and using the opinions of the project managers, core team members, end users and consultants/implementation partners assessed the implementation success, test the relationship and draw explanation.

The result of the study shows that; with the established criteria EEU's ERP implementation performance is under average; found that the Top Management, Technology Management, Process Management, Change Management and Project Management Roles have a strong and positive relationship with ERP implementation success; and all the management roles have a respectable amount of variance to explain the ERP Implementation Success. Additionally, in order to exploit the full potential from ERP, more efforts to be practiced to improve the effectiveness of the five management roles and further research in the five management roles areas are recommended for the case of EEU.

Keywords: Critical Success Factors; ERP Implementation Assessment; Enterprise Resource Planning; Ethiopian Electric Utility; Management Roles.

Chapter One: Introduction

1.1. Background of the Study

Enterprise Resource Planning (ERP) is an integrated software package consisting of a set of standard functional modules (production, sales, human resources, finance, etc.) developed or integrated by the vendor that can be adapted to the specific needs of each customer (Frimpon, 2012). ERP systems are computer applications with two important characteristics: data integration and support for best practice processes (Sneller, 2014). According to Sneller, organizations that implement ERP expect that the data integration characteristic will improve the quality of their decision making as well as increase their efficiency. By using the best practice processes that support by ERP, organizations want to speed up their processes, and improve the quality of those processes.

These days ERP has become one of the most important developments in the corporate use of information technology as a strategic tool, which equips the enterprise with the necessary capabilities to integrate and synchronize the isolated functions into streamlined business processes (Kanhaiya, 2006). Although ERP implementation is growing very fast and many companies taking initiatives to implement ERP, it is expensive and not a magic tool which will transform everything overnight. ERP systems, when implemented successfully, bring significant benefits. However, successful implementation is a long journey towards enterprise excellence that many issues need to be addressed to achieve the expected results from the implementation. Additionally, the successful implementation rate is low and many firms that have gained some benefits from ERP have yet to exploit the full potential of ERP in their organizations (Zhang et al., 2003).

1.2. Background of the EEU's ERP Implementation Project

The Ethiopian Electric Utility (EEU) has initiated to create a robust IT infrastructure to implement ERP, as part of revitalize the country's electricity sector and provide reliable and affordable power to the citizens of Ethiopia and implementation of the second pillars of the overall transformation. The major objectives of implementing the ERP system are: Provide an ICT-Enabled work environment; Support the business strategy of EEU; and Using ICT as a strategic monitoring tool (Ethiopian Electric Power [EEP], 2015).

The main reasons for implementing the ERP system in EEU were to facilitate customer service; to increase efficiency, effectiveness, performance and productivity; to integrate information in business processes and practices; to decrease burdens for managers and employees; to reduce cost; to use better technology; and timely problem solving. Because, the legacy system was facing many challenges and pains resulted from not having ERP system. The draw backs in the legacy system were: Using lots of different software for different processes, so that, easily access to information about the business was difficult; Accounting takes longer than sales and the customers experience are suffering; Business operation are not smoothly facilitated due to complex and time-consuming ICT; and Organizational resources not managed efficiently and effectively.

The project will cover all business units and locations of EEU all over the country and the implementation of the ERP system is divided into two go live and roll out phases (EEP, 2015). The first phase covers EEU's all business areas located at Addis Ababa; that is, Head quarter, 7 different locations and 75 customer service centers. In the second phase, the go live and rollout will cover all regional business locations outside Addis Ababa.

1.3. Statement of the Problem

The ERP system success or failure could be influenced by how the companies handle the implementation process. As many factors affecting ERP implementation, these factors could have a positive impact on the outcome of the ERP project or lack of them could influence the outcome negatively. Thus, many researchers have attempted to identify the critical success factors (CSFs) for successful ERP implementation. For example, (Shatat, 2017; Al-Fawaz et al., 2008; Zhang et al., 2003; Dezdar and Ainin, 2011; Al Qashami and Mohammad; 2015, Afaneh et al., 2015; Azad et al.; 2013; Frimpon, 2012) agreed that identifying the CSFs as early as possible and to analyze ERP implementation in case studies could provide an implementation framework which maximizes efficiencies and provide valuable clues to help project managers improve their chances of success.

However, most of the studies carried on CSFs areas lack theoretical basis that successfully link the CSFs to implementation outcomes of any kind (Otieno, 2010). Besides, there is no consensus on CSFs owing to difference in context between implementing organizations (Leopoldo & Otieno, 2005). Thus, Frimpon (2012) recommended that, it is better to bring some structure into

the process by placing the possibly conflicting CSFs into separate groups, i.e., top management, technology management, process management, change management, and project management role groups where they may together help achieve the sub-objectives of the main ERP objective of a successful implementation.

Although the first phase of EEU's ERP implementation project is going on, the system is not stabilized as expected. It is essential to identify the CSFs, develop criteria and assess the effectiveness of the implementation process of the project as researchers recommended above. The author of this paper, as a team member of the ERP implementation project of EEU, has been motivated to undertake this research. Therefore, this research tried to answer the following questions.

1. Has the ERP implementation in EEU been successful? and
2. How can the effectiveness of the five management roles related with ERP implementation success be explained for the case of EEU?

1.4. Objectives of the Study

This case study is tried to assess and draw explanations ERP implementation success based on management roles effectiveness. Thus, the specific objectives of the study are;

1. To describe the extent to which the overall ERP implementation have been successful.
2. To determine the relationship between ERP implementation success and the five management roles effectiveness.
3. To draw explanation based on the relationship between the management roles effectiveness and ERP implementation success for the case of EEU.

1.5. Significance of the Study

EEU is implementing ERP to improve its business. Thus, this research will have a contribution to successful ERP implementation by identifying the gaps in the critical issues that affect the implementation process and know how to address them effectively to ensure that the promised benefits can be realized and potential failures can be avoided in future EEU endeavors.

Recently most of the organizations in Ethiopia have started to implement ERP technologies to improve their organization business management. Thus, to practitioners who are interested in

implementing ERP systems, it will provide valuable insights how best they can utilize their limited resources.

It may also help as a reference material in future academic researches by filling the literature gap on ERP implementation in Ethiopian context. Thus, it will provide valuable insights for the researchers to pay adequate attention to those factors that are most likely to have an impact upon the implementation of the ERP system.

1.6. Scope of the Study

The scope of this research is to investigate the success of ERP system implementation in EEU. The study is focused to the assessment of the first phase of ERP implementation success from the initial preparation to the go live stage. Therefore, the assessments are carried out in EEU's business locations found in Addis Ababa.

1.7. Limitations of the Study

Like any other research, this study has encountered some limitations and constraints. It was conducted by a staff member of the organization and the responses of respondents might be influenced by bias, fear and change resistance factors. There was inaccessibility of some interviewees and survey respondents due to location, busy office works and the overall time constraint of the research program. Additionally, limited or few literature and research on ERP in Ethiopian context for reference was also another constraint.

1.8. Organization of the Paper

This paper is organized into five chapters. The first chapter deals with introductory part, which consists of background of the study, statement of the problem, objectives of the study, significance of the study, scope and limitations of the study. The second chapter deals with review of related literature. It deals the ERP system implementation and benefits, ERP implementations challenges and critical success factors, ERP implementation evaluation models, the conceptual framework and hypotheses of the study. In the third chapter, the methodologies that are used to gather the data required to support the development and analysis of the study are discussed in detail. The fourth chapter presents, analyzes and discusses the findings of the study. Based on the finding of the study, the fifth chapter presents conclusion and recommendation of

the study. All the reference materials used in this case study are listed under the reference part. Additionally, the questionnaires and some statistical results are annexed with this paper.

Chapter Two: Review of Related Literatures

2.1. ERP Implementation

ERP implementation is a stage on ERP system life cycle which helps to install, design, configure, test and prepare software to use (Afaneh et al., 2015). Sneller (2014) discussed the parties involved in the ERP market place, the logical architecture of an ERP system, and the life cycle phases of ERP implementation.

Organizations that intend to implement ERP will meet three parties in the ERP market place (Sneller, 2014). Firstly they have to select an ERP supplier that a license agreement as well as maintenance agreement is agreed with. Secondly, most organizations also use implementation partners, consultancy firms that are specialized in ERP. Implementation partners offer a variety of ERP-related service including advice on the use of best practices; model the ERP system, train future users and support the migration, import or export of data from other information systems. Finally, an ERP system can be kept up and running by application service provider, which guarantees the availability and reliability of the ERP system for a predetermined group of users. The application services can be outsourced or provided by the internal IT department.

The logical architecture of an ERP system, according to Sneller (2014), has three elements: ERP interaction, ERP database, and ERP business logic. The ERP interaction element takes care of the exchange of information between the ERP system and its environment. The ERP database carries out the storage and retrieval of all data that are required for the correct functioning of the ERP system. The ERP business logic consists of a large number of best practices that are either programmed in the system or can be configured. The logical ERP system has to be installed on a physical IT architecture: the main, the client-server, and the browser architectures.

Once an organization has implemented an ERP system it will use the system for several years. In this long ERP life cycle a number of phases can be distinguished: the ex-ante evaluation, the configuration and roll out, the go live, and the onward and upward phase (Sneller, 2014). The ex-ante is the pre-selection of ERP suppliers, implementation partners and application service

providers. The configuration and roll out principle is the sourcing basis between the implementation partner's consultants and the organization's employees that can vary from turn-key to do-it-yourself. The go live principle is the model-building strategy that the choices are big bang or some form of phasing. The onward and upward is the longest phase that the benefits of the ERP implementation will only be realized.

2.2. ERP Implementation Benefits

ERP systems are among the most popular Information Technology (IT) software being adopted in organizations globally to offer strategic and operational improvements to firms. The system is an enterprise-wide information system designed to coordinate all the resources, information, and activities needed to complete business processes. It supports the business system that maintains a single database for a variety of business functions such as Manufacturing, Supply Chain Management, Financials, Projects, Human Resources and Customer Relationship Management. Now a day's ERP systems are being adopted by various organizations as part of their business growth strategies and play an important role for small scale and large scale industries to run all their major functional and process operations (Singh & Singh, 2013; Batada & Rahman, 2012). ERP systems are being implemented by different industries across the world both in production and service domains.

Recently, service organizations have invested considerable resources in the implementation of ERP systems to improve efficiency, cost effectiveness and quality of service operations of the various service industries. The benefits of the ERP, as per Harris (2017), can be classified into operational, managerial, strategic, IT infrastructure, organizational, and intangible dimensions.

Regarding operational benefits, cost, performance, quality and cycle time can all be benefitted through ERP. The interaction between different business functions and information can be improved (Alsalem, 2008). The quality of information increases and the time taken to complete tasks are reduced by a large extent. According to Harris (2017), managerial benefits include planning and decision making of managers and these can be improved by ERP systems; businesses can grow and have innovations with the help of ERP to gain strategic benefits; through IT infrastructure, the ERP system can provide flexibility to balance them if any changes are to occur in the current scenario or in the future; and organizational benefit of the ERP system is bringing a common vision and idea to empower the employees effectively. Johansson

(2012) identified intangible benefits due to ERP implementation such as increased flexibility, better customer satisfaction, improved resource utility, and improvement in accuracy and better decision making ability.

2.3. ERP Implementation Challenges and Critical Success Factors

According to Panorama Consulting Solutions (2019), there is no easy way to implement an ERP system because the implementation process is a disruptive undertaking for any organization. It requires steady leadership, significant resource investment, the right system integrator as well as a detail project plan and communication strategy. Ultimately, ERP success requires a thorough analysis and integration of people, processes and technology.

Despite the intended benefits, many researchers have concluded that many organizations have been unable to make use of the ERP systems successfully (Harris 2017; Chao & Baptista, 2009). Most ERP systems tend to be large, complicated, and expensive (Al-Fawaz et al., 2008). Moreover, ERP implementation requires an enormous time commitment from an organization's information technology department or outside professionals.

In addition, because ERP systems affected most major departments in a company, they tended to create changes in many business processes. According to Al-Fawaz et al. (2008); Shang & Seddon (2002), putting ERP in place requires new procedures, employee training, and both managerial and technical support.

According to Kanhaiya (2006), to get the most from the software, organizations have to get people inside company to adopt the work methods outlined in the software. If the people in the different departments don't agree that the work methods embedded in the software are better than the ones they currently use, they resist using the software or want IT to change the software to match the ways they currently do things. IT gets bogged down in long, expensive customization efforts to modify the ERP software to fit with existing business practices. Customizations make the software more unstable and harder to maintain. Because ERP covers so much of what a business does, failure in the software can prove costly. This is where ERP projects breakdown.

Kanhaiya (2006) argued that the migration from legacy system to ERP is a very serious business and requires high level of involvement from top management. The shift should be taken as a strategic decision rather than cosmetic change. Risk, reward and costs involved are high and

expectations from the shift should be rationally optimal rather than what the consultants say. Change management and training aspects need special attention and should be taken up before, during and after the project implementation.

In order to obtain the benefits organizations have to plan ERP implementation carefully (Dezar & Ainin, 2011). Many ERP projects have been delayed, reported as being over budget and have required additional funding (Zhang et al., 2005). In addition, the ERP system is perhaps the single largest IT investment an organization can make (Teltumbde, 2000). Therefore, according to Dezar and Ainin, it is important to understand which factors contribute to the occurrence of problems and identify ways to overcome them.

A major problem with ERP case studies is that very few implementation challenges resulting in these failures have been reported in the literature, and thus the reasons for implementation failure is not known to practitioners or researchers (Otieno, 2010). According to Otieno, this is a motivation for researchers towards conducting empirical studies to explore challenges that affect ERP systems implementation; because, identifying challenges relevant to local companies is one way to increase the chances of a successful local ERP implementation.

Implementation success deals with the issues of how to succeed through an ERP implementation and it covers aspects such as ERP project success and failure definitions, problems and outcomes, critical success factors and risk management (Esteves & Pastor, 2001). Critical Success Factors (CSFs) are elements related to the adoption and installation of ERP that are thought to lead to successful implementation (Afanehet al., 2015).

The concept of CSFs was developed in the early 1960s. According to AlQashami & Mohammad (2015), Ronald Daniel first discussed the idea of CSFs in the management literature, stating that information analysis must focus on “success factors” when as a new approach to help achieve organizational goals. The process of identifying CSFs helps to ensure that these factors receive the necessary attention and are carefully managed by an organization. CSFs are the few key areas where things must go right for the business to flourish and for the manager’s goals to be attained. CSFs, if addressed, significantly improve project implementation chances. Therefore, in the ERP context, CSFs can be defined as a set of activities that need special considerations and continual attention for planning and implementing an ERP system. They can also be defined as factors

needed to ensure a successful ERP project. Thus, CSFs are particularly useful, as they provide clear insight and guidance on where to focus special consideration and resources and continual attention in planning for successful ERP project implementation.

An ERP process involves an overabundance of factors that impact the implementation to varying degrees (Frimpon, 2012). Thus, many researchers tried to outline and discuss the key factors that contribute to ERP success. Most of the studies carried on CSFs areas lack theoretical basis that successfully link the critical success factors to implementation outcomes of any kind (Otieno, 2010). Besides, there is no consensus on CSFs owing to difference in context between implementing organizations (Leopoldo & Otieno, 2005).

According to Esteves & Pastor (2001), adequate ERP implementation methodologies were pointed out as a critical success factor. However, there is a lack of studies about the definition, usage and adequacy of these methodologies and their value in ERP projects. There is the need to develop approaches to put in practice and manage the CSFs identified in some studies. The development of techniques and approaches for the control and monitoring of ERP implementation projects is an area to be improved. It is also important to relate CSFs with implementation methodologies.

2.4. Models to Evaluate ERP Implementation

ERP projects are complex purposes which influence main internal and external operations of companies. There are different research approaches which try to develop models for IS/ERP success measurement or IT-success measurement in general (Kronbichler et al., 2010). Although success is complex and difficult to measure, researchers are making efforts in doing so. For example, A Framework Proposal for Monitoring and Evaluating Training in ERP Implementation Projects (Esteves et al., 2002); A Systematic Framework for Assessing the Implementation Phase of ERP systems (Akiki et al., 2012); Evaluation of ERP Systems Quality Model Using Analytic Hierarchy Process (AHP) Technique (Al-Rawashdeh et al., 2014); Evaluating ERP Projects with multi-attribute decision support systems (Bokovec et al., 2015); A Framework for Evaluating ERP Implementation Choices (Luo & Strong, 2004); Designing ERP Software Evaluation Procedure for a Government Organization (Goztepe et al., 2015); A framework for evaluating ERP projects (Teltumbde, 2000); A new evaluation model of ERP system success (Zouine & Fenies, 2015).

According to Kronbichler et al. (2010), a recommendation which model should be used or which one is the best is not possible. Each model has its own area of application and sometimes a specific measurement approach based, for instance, on different systems or different stakeholders involved. Their research paper shows some of the most important models developed in the literature and an overview of the different approaches of the models to analyze the strengths, weaknesses and the cases in which the specific model could be used is made.

An ERP implementation process is a complex programming initiative with an overabundance of influencing factors that can shape its success (Frimpon, 2012). His paper has two objectives: to use simple project management tools and techniques to restructure the implementation process in order to reduce the complexity and to build a stable model that will be largely insensitive to minor perturbations. Thus, the 28 CSFs used in his model are partitioned into 5 special groups called roles. The restriction of the interactions to within roles resulted in a reduction of pair-wise comparisons between CSFs from 378 in the unstructured process to 79 in the model. Pair-wise comparisons are a measure of complexity. In addition, the rate of change of pair-wise comparisons reduced from 29 in the unstructured process to a maximum of 9 and as low as 5 in the model.

2.5. The conceptual framework of the study

The conceptual framework of this study tries to link the research question with the empirical study by selecting five management roles effectiveness based on their critical success factors criteria. In order to undertake the study, relevant theoretical and empirical data in electronic sources of materials related to ERP implementation have been searched, using words like "ERP implementation evaluation models", "ERP in Africa", "ERP in Ethiopia", and "Critical Success Factors of ERP".

A process that has many positive attributes but carries with it the risks of cost and schedule overruns as well as dreadfully low-success rate figures is necessarily a complex one. The main reason for the complexity of an ERP implementation process is the vast array of variables encountered in the planning, execution and monitoring process. The complexity is further magnified by the overwhelming number of interactions and relationships between the variables.

This complex exercise can only be managed using tried and tested project management principles (Frimpon, 2012).

Thus, by using a compiled list of CSFs from other research work, Frimpon (2012) identified 28 unique CSFs by his paper. According to him, this number is very large for any software process that with such a large number there is the likelihood that many may have conflicting objectives. Therefore, it is helpful to bring some structure into the process by placing the possibly conflicting CSFs into separate groups where they may together help achieve a sub-objective of the main ERP objective of a successful implementation. Grouping criteria can help the process of checking whether the set of criteria selected is appropriate to the problem, ease the process of calculating criteria weights in some methods, and can facilitate the emergence of higher level views of the issues.

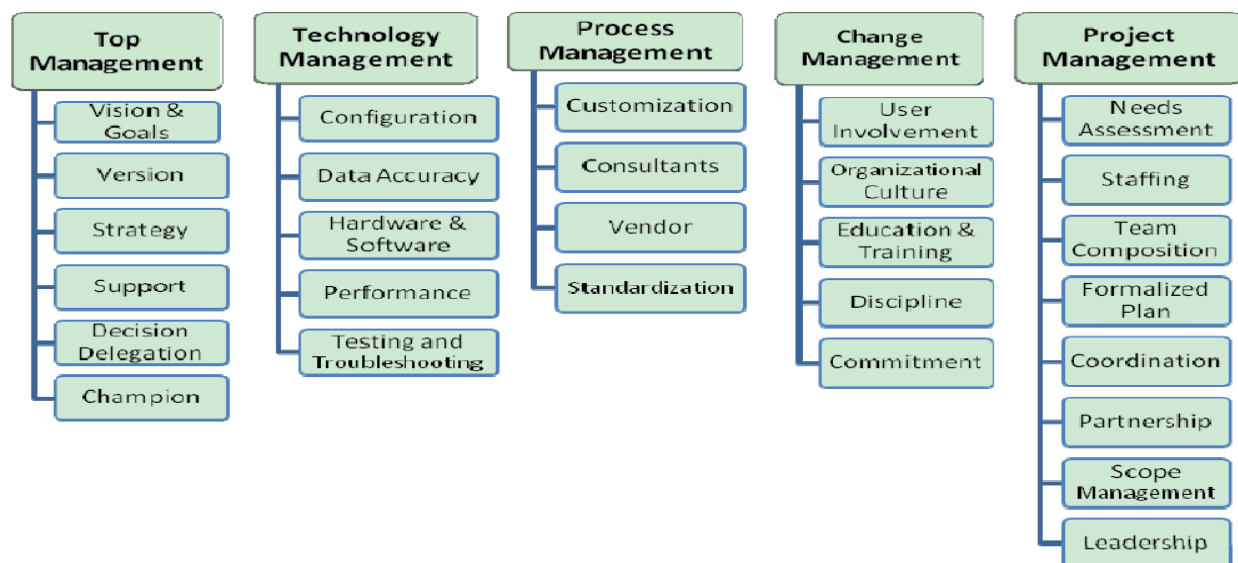


Figure 1. Roles with their associated CSFs. Source: Frimpon (2012).

As shown in Figure 1, the criteria are the CSFs. A role is defined as a group of CSFs identified and put together for the purpose of achieving a sub-objective. Thus, roles are sets created to hold specific CSFs that help the attainment of the main objective. In this structuring exercise, the CSFs are placed in roles according to the following criteria: 1) Function: Identify the CSFs necessary to achieve the goals and objectives; and 2) Best measure: Many other CSFs can be measures of the role but this CSF is the best or among the best.

2.5.1. The Top Management Role

The top management role includes goals and vision, version, strategy, support, delegate the decisions, and champion (Frimpon, 2012).

Goals and vision: Goals should be clearly defined and well-understood (Shanks et al., 2000). A good business vision is also helpful because it reduces the effort of capturing the functionality of the ERP business model and therefore minimizes the customization effort (Esteves & Pastor, 2000). Visioning and planning requires articulating a business vision to the organization, identifying clear goals and objectives, and providing a clear link between business goals and IS strategy (Finney & Corbett, 2007).

Version: The choice of the correct ERP version has to be decided upon. An older version may result in frequent updating (Esteves & Pastor, 2000). This is especially true in Africa where the tendency is for officials to purchase the most outmoded software and other products from China and the West.

Strategy: This includes management decisions concerning how the software package is to be implemented. There are different approaches to ERP implementation strategy ranging from 'phased' to 'big-bang' implementations (Panorama Consulting Solutions 2019), centralized versus decentralized (Siriginidi, 2000). Also there is the benefit of introducing a new system and completely forgetting about the legacy system (Finney & Corbett, 2007).

Support: Management support is important for accomplishing project goals and objectives and aligning these with strategic business goals in terms of their own involvement and the willingness to allocate valuable organizational resources. It has been empirically proven that strong and committed leadership at the top management level is essential to the success of an ERP implementation (Finney & Corbett, 2007).

Decisions delegation: Project team members must be empowered to make quick decisions to reduce delays in implementation related with slow decision-making. Organizations should attempt to make decisions as rapidly as possible, as even small delays can have an impact on such a long-term project.

Champion: The role of the project champion is very important for marketing the project throughout the organization. The champion is really an ERP project advocate. The individual should possess strong leadership skills, as well as business, technical and personal managerial competencies (Finney & Corbett, 2007).

H1. Effective top management role has a strong and positive relationship with ERP implementation success.

2.5.2. The Technology Management Role

The technology management roles include hardware and software, data accuracy, configuration, monitor system performance, and test/troubleshoot system (Frimpon, 2012).

Hardware and software: Management must make a careful choice of an ERP package that best matches the legacy systems, e.g. the hardware platform, databases and operating systems. The suitability of software and hardware refers to the fit between the selected ERP system and the hardware. Lack of data software quality and reliability and the hardware, software difficulties lead to ERP failure (Singhal et al., 2011).

Data accuracy: Data loaded from existing legacy systems must be of high quality. Data must be cleansed and transferred to the ERP system to ensure no disruption to performance, high quality data is very important in the integrated environment of an ERP system (Shanks et al., 2000).

Configuration: Configuring the software and making it actually useful to the business is an aspect of ERP implementation that no business manager is ever willing to face. Serious attention should be given to the conference room pilot (CRP), which provides a demonstration of the ERP system that users can test drive before the system configuration is locked down. The system should not be under configured. It can become a nightmare to spend many months designing and building a system, just to have it perform slowly out of the gate (Swartz & Orgill, 2001).

Monitor system performance: Milestones and targets need to be actively monitored to track the progress of an ERP project indicated that project management-based criteria should be used to measure against completion dates, costs, and quality and operational criteria should be used to measure against the production system (Nahet et al., 2003). The monitoring of performance are very critical factors in ensuring the success of any organization (Yingjie, 2005).

Testing and troubleshooting: Troubleshooting errors is critical. Rigorous and sophisticated software testing eases implementation. Development and testing perspectives unique to ERP projects must be well-thought-out and managed (Nah et al., 2003).

H2. Effective technology management role has a strong and positive relationship with ERP implementation success.

2.5.3. The Process Management Role

The process management roles include consultant support, vendor support, standardization, customization (Frimpon, 2012).

Consultant support: Considering the staff, an advantage could be obtained by the quick and substantial transfer of knowledge from consultants to qualified staff, creating the possibility for them to participate to the tasks of external consultants or even to take them over. In fact, it is imperative to arrange for knowledge transfer from the consultant to the company so as to decrease the dependency on the vendor/consultant (Finney & Corbett, 2007).

Vendor support: Companies purchase ERP packages from foreign ERP vendors and ERP represent the best-practice processes that is different from organizational business process, thus, it's important to get the vendor's support. Software vendors should be carefully selected since they play a crucial part in shaping the ultimate outcome of the implementation (Panorama Consulting Solutions, 2019).

Standardization: Organizations should be willing to change their businesses to fit the software in order to minimize the degree of customizations needed (Shanks et al., 2000). Wherever and as far as possible, the ERP-hosting organization should try to adopt the processes and options built into the ERP, rather than seek to modify the ERP to fit the particular business practices. Organizations should be committed to the idea of implementing the unadulterated or basic version with no or minimal customization (Finney & Corbett, 2007). That is the ultimate in standardization.

Customization: Even the most robust out-of-the-box ERP functionality might need to be customized to fit the business. The possibilities of such customizations should be addressed upfront versus during mid-deployment, in order to have better control over the costs. The

management of the tradeoffs between customization and standardization is a key to a successful implementation (Finney & Corbett, 2007).

H3. Effective process management role has a strong and positive relationship with ERP implementation success.

2.5.4. The Change Management Role

The change management role includes user involvement, organizational culture, education and training, discipline, and commitment (Frimpon, 2012).

User involvement: A major cause of ERP failure is lack of employee involvement (Barker & Frolick, 2003). User involvement and participation will result in a better fit of user requirements achieving better system quality, use and acceptance. Statistical results show that lack of end user involvement can cause the ERP process to have difficulties (Lee & Lee, 2001).

Organizational culture: Culture has a substantial and definite influence on organizations, organizational behavior, and the management of organizations. Many difficulties have been faced when implementing and using western technologies, management processes, information systems methods, and information systems techniques in developing countries (Shanks et al., 2000). Enterprise-wide culture and structure change should be managed, which includes people, organization, and culture change. A culture with shared values and a strong corporate identity that is conducive to change is critical. In the local context, the mentality change from using reams of paper to electronic media should be encouraged, and ERP facilitates that (Nah et al., 2003).

Education and training: The most measured subset of costs is the initial software development efforts while the most uncertain and often the largest cost is long-term maintenance and training (Hubbard, 2007). Users can only gain an appreciation of the utility of the system only if they are well trained to use it. Insufficient training causes significant negative impact on ERP systems implementation (Lee & Lee, 2001).

Discipline: Ensuring that a complex change like that associated with a transcendental information system that gets the right results, in the right timeframe, at the right costs, requires a paradigm change in an attitude as basic as discipline. This can be improved through indoctrination at meetings to address attitudinal changes. Lack of discipline, resistance,

and lack of broad-based company commitment are the major factors that slow down the process of implementation (Zhanget al., 2003).

Commitment: Sustained management commitment, both at top and middle levels during the implementation, in terms of their own involvement and the willingness to allocate valuable organizational resources. The need for organizational commitment should be stressed during strategy sessions because a lax in that can scupper the project (Zhang et al., 2003).

H4. Effective change management role has a strong and positive relationship with ERP implementation success.

2.5.5. The Project Management Role

The project management role includes needs assessment, competent team, heterogeneous team, formalize plan, coordination, partnership, scope management, leadership (Frimpon, 2012).

Needs assessment: One of the first steps involves evaluating the needs and requirements that will drive the implementation of an ERP system. A needs assessment with a definition of requirements is essential not only to guide the start of the project, but also to gauge the success of the project after completion. The basic description of needs should be refined to a set of specific institutional acceptance criteria at an early phase of the project. This statement will be used at a later date to help evaluate the success of the project in meeting these goals (Swartz & Orgill, 2001).

Competent team: A dedicated and competent staff is a must. Esteves & Pastor (2000) lists this factor as one of the critical success facts. Furthermore, researches examined the relationship between CSFs and ERP system performance, among the CSFs identified was maintaining excellent staffing (Wen et al., 2003).

Heterogeneous team: ERP projects typically require some combination of business, information technology, vendor, and consulting support. The structure of the project team has a strong impact in the implementation process. Two important factors are the integration of third-party consultants within the team and the retention within the organization of the relevant ERP knowledge (Esteves & Pastor, 2000).

Formalize plan: A single integrated project plan, not a collection of independent plans, can't be rolled into a summary report to management (Swartz & Orgill, 2001). This means to have a well-defined plan/schedule for all the activities involved in the ERP implementation, with an appropriate allocation of budget and resources for these activities. Evidence shows that the majority of projects fail to finish the activities on time and within budget (Esteves & Pastor, 2000).

Coordination: Good coordination and communication between implementation partners are essential (Nah et al., 2003). According to researches, project management has evolved in order to plan, coordinate and control the complex and diverse activities of modern industrial and commercial projects (Zhang et al., 2003). A faulty communication between these parts is a major failure cause in implementing information systems. Communication means not only sharing information between the project team but also communicating to the whole organization the results and the goals in each implementation stage. The communication effort should be done in a regular basis during the implementation phase (Esteves & Pastor, 2000). In order to successfully accomplish the decision to implement an ERP system, the effective project management comes into play to plan, coordinate and control such an intricate project (Yingjie, 2005).

Partnership: During the implementation phase there are different partners involved such as consultants and software and hardware vendors. An adequate partnership between them will ease achievement of the goals defined (Esteves & Pastor, 2000). The project leadership must engender trust and avoid attrition and unnecessary competition among members.

Scope management: This factor is related with concerns of project goals clarification and their congruence with the organizational mission and strategic goals. This includes both scope definition and subsequent scope control. Some components of this factor are: scope of business processes and business units involved, ERP functionality implemented, technology to be replaced/upgraded/integrated, and exchange of data (Esteves & Pastor, 2000). Avoid Scope creep, which is clearly delineating and effectively limiting the scope of the project. While new functionality shouldn't be rejected outright, hard decisions have to be made to keep the project from careening out of proportion (Swartz & Orgill, 2001). When there are unrealistic

expectations from the ERP, poor estimation of its scope and size, it creates a mess and the realistic goals are lost.

Leadership: Effective leadership is critical. This is an additional recommended CSF for a successful ERP implementation. The Project leader needs leadership skills and respect of project members and administration (Swartz & Orgill, 2001). The single most important attribute of this key individual is the ability to efficiently and effectively run a large project, not loyalty to the organization. Swartz and Orgill argued that broad-based, consensus decision-making doesn't generally work on ERP projects.

H5. Effective project management role has a strong and positive relationship with ERP implementation success.



Figure 2. The Conceptual Framework of the study.

2.6. Dependent and Independent Variables of the Study

This case study tried to assess the ERP implementation success of EEU against the five management roles by adapting the Frimpon's re-structured CSFs "role" model for ERP implementations (fig.2). As described above, the model grouped the CSFs into roles that can ease the calculation their weight in relation to the specific objectives and can ease the weight calculation of the roles in relation with the general objectives of this study. The author of this paper has also considered the model's roles and CSFs familiarity with the sample population in the study and would greatly enable assessment of the ERP implementation success in EEU.

The roles are the pillars that shoulder the burden of the implementation of the ERP process. A weakness in any of the pillars can result in a failure. On the other hand, all the pillars have to be managed well to result in a successful implementation (Frimpon, 2012).

2.6.1. Dependent Variable: ERP Implementation Success

Good project planning is a critical step in the ERP process and must be carried out diligently. Thorough planning not only provides a blueprint for the implementation, but also becomes a most important risk mitigation tool (Frimpon, 2012). A targeted process properly managed using tried and tested project management principles is what will allow a process to not become part of the statistics of failure that dot the ERP landscape. A sub-optimization in any of the pillars will result in a failure as has been chronicled in many papers. When the pillars are sturdy, then a successful implementation is assured.

2.6.2. Independent Variables: Pillars of Successful ERP Implementations (Roles)

As discussed above; the five Management roles are groups of CSFs and pillars of successful ERP implementation process that need to be effectively managed to assure success. Therefore, the independent variables are Top Management Role, Technology Management Role, Process Management Role, Change Management Role, and Project Management Role.

Chapter Three: Research Methodology

3.1. Research Strategy

As presented in the previous chapter, a review of the literatures on CSFs for ERP system implementation process regarding the management roles were conducted in order to develop research framework that associate the roles effectiveness with the ERP implementation success for the case of EEU. According to Yin (2003), case studies can be used to explain, describe or explore events, or phenomena in the everyday contexts in which they occur and in turn can help to understand and explain casual links and pathways resulting from a new policy initiative or service development. Thus, various data collection methods can be employed and used in combination. Therefore, this research followed a mixed approach methods (i.e. combination of quantitative and qualitative).

3.2. Research Design

According to Saunders et al. (2008), if a research project utilizes description it is likely to be a precursor to explanation, because, description in management and business research should be thought of as a means to an end rather than an end in itself. Thus, they recommended for descriptive research designs to be descripto-explanatory studies.

This case study is conducted in EEU to assess the opinions of different participants in the project of ERP system implementation, to describe the extent to which the overall ERP implementation success have been met related to management roles effectiveness and test the formulated hypotheses to draw explanation. Therefore to achieve the objectives the study, descriptive research design method used to describe and draw explanation.

3.3. Sampling Techniques and Sample Size

As shown in Table 1 below, the total population of this study consists of project managers, package leads, core team members, end users, and consultants/implementation partners of EEU's ERP implementation project. The overall scope of the project covers all business units and locations of EEU all over the country (EEP, 2015). However, the implementation of the ERP system is divided into two go live and roll out phases.

Since the scope of this research focuses in the first go live and roll out phase of the project, the target population is consist of members of the ERP program management office and end users

found in Addis Ababa. Thus, the total number of end users has to be counted from head quarter, 7 different locations and 75 customer service centers. So that, end users from 219 regional business locations outside Addis Ababa are not targeted.

Table 1. The targeted population of the study: Source (researcher's observation)

No.	Total population	Quantity
1	Project Managers level	3
2	Package leads level	3
3	Core team members level	15
4	End users level found in Addis Ababa	340
5	Consultants/Implementation partners level	3
	Total	364

To determine sample size using Yamane sample calculating technique, $n = N/(1+Ne^2)$, with 95% confidence level and 5% margin of error, a sample size for a population size for 364 will be approximately 190. However, due to inaccessibility of some interviewees and survey respondents due to location, busy office works and the overall time constraint of the research program, for this study a total of 167 purposively selected samples are used. In order to discuss the relationship between the dependent and independent variables, 3 samples (all the 1 project manager and 2 purposively selected consultants/implementing partners) are selected. Additionally, to describe the ERP implementation success, questionnaire is distributed to a sample of 3 package leads, 5 core process leads and 156 end users.

Package leads and core process leads, as they are deployment team members during the implementation, are selected purposely and are asked qualitative questions to share their experience of what worked well, what could have been done better and recommendation for future endeavors. The end users, as they are currently operating on the system on a daily basis around the dispersed geographical business locations found in Addis Ababa, are responded quantitative Likert scale questionnaires using nonrandom techniques. Thus, in order to address all business areas found in Addis Ababa almost equal quota is given module package level, that

is, 77ERP Enterprise Core Component (ECC) and 79Customer Centric Application (CCA) end users are selected.

3.4. Data Collection Methods and Approaches

Techniques that are used in data collection include semi-structured interview and questionnaire. The questionnaires are developed with questions based on the CSFs criteria for the effectiveness of the management roles to describe ERP implementation success and are seek to test the hypotheses that are developed in the literature review section. In this study, the primary data that are collected through questionnaires are prepared by adapting from various researches and modified by the researcher. Additionally, two sets of questionnaires which are close-ended and open-ended questions are used. The package leads and core process leads are asked open ended questions and end users are asked close ended questions. The project managers and consultants/implementing partners, are conducted semi-structured interviews to discuss on the relationship between the dependent and independent variables.

According to Saunders et al. (2008), the confidentiality of the data that would have to be provided and the anonymity of the organization or individual participants have to be assured. Therefore, clear assurances about these aspects need to be provided and promised. Thus, an introductory letter is given to guarantee at the time of making the request for access by writing not to share raw data with anyone and assurances about anonymity and confidentiality to participants.

3.5. Method of Data Analysis

In order to analyze and interpret the collected data, quantitative and qualitative analysis method are employed. To accomplish the task of data analysis for quantitative data, codes are assigned based on themes of the management roles and using the coding process to generate the description of the theme for the analysis. The data are interpreted by using tables, applying reliability test, and correlation analysis. Data analysis is used SPSS20 software. The qualitative data are also analyzed, summarized and presented under each management roles for triangulation.

Chapter Four: Data Presentation, Analysis and Interpretation

4.1. Demographic Information of End Users Respondents

The total number of end users respondents is 156. Their demographic data is shown in the following tables below. Data is gathered proportionally from all functional areas located in Addis Ababa. From the category of 156 respondents of end users, as presented in Table 2 below, 49.4% are Enterprise Core Component (ECC) and 50.6% are Customer Centric Applications (CCA) package users.

Table 2. Demographic data of the end user respondents. Source primary data 2019

Age					
	Frequency	Percent	Valid Percent	Cumulative Percent	
Valid	20-30	36	23.1	23.1	23.1
	30-40	63	40.4	40.4	63.5
	40-50	33	21.2	21.2	84.6
	50-60	24	15.4	15.4	100.0
	Total	156	100.0	100.0	

Gender					
	Frequency	Percent	Valid Percent	Cumulative Percent	
Valid	Female	70	44.9	44.9	44.9
	Male	86	55.1	55.1	100.0
	Total	156	100.0	100.0	

Year of experience					
	Frequency	Percent	Valid Percent	Cumulative Percent	
Valid	0-10	50	32.1	32.1	32.1
	10-20	80	51.3	51.3	83.3
	20-30	25	16.0	16.0	99.4
	30-40	1	.6	.6	100.0
	Total	156	100.0	100.0	

Highest level of education				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Diploma	22	14.1	14.1
	Degree	114	73.1	87.2
	Masters	20	12.8	100.0
	Total	156	100.0	

ERP Module				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ECC	77	49.4	49.4
	CCA	79	50.6	100.0
	Total	156	100.0	

4.2. Descriptive Statistics

The discussion in this part relates to the descriptive statistics results of the five independent variables in relation to ERP implementation success at EEU. Low numbers in the results shows higher effectiveness. Because, the collected data is calculated in the following manner:

1 = Strongly Agree, 2 = Agree, 3 = Neutral, 4 = Disagree, and 5 = Strongly Disagree

4.2.1. The Top Management Role

The Top Management Role is calculated in relation to six CSFs, as shown in the Table 3 below, to describe the role's effectiveness. Version has the least mean value (2.6154), Goals and Vision (2.8397), Strategy (3.0641), Support (3.1731), Champion (3.4551) and Decision Delegation (3.4744) has the higher mean value. This shows that Version is the most effectively practiced criteria among the rest CSFs.

The results in this category indicate the organization has to work more on Decision Delegation, Championing, Supporting and outlining Strategy.

Table 3. Total effectiveness of the Top Management Role. Source primary data 2019

	N	Minimum	Maximum	Mean	Std. Deviation
Goals and Vision	156	1.00	5.00	2.8397	.85381
Version	156	1.00	5.00	2.6154	.68591
Strategy	156	1.00	5.00	3.0641	.81660
Support	156	2.00	4.00	3.1731	.68310
Decision Delegation	156	2.00	5.00	3.4744	.65696
Champion	156	1.00	5.00	3.4551	.71250
Valid N (listwise)	156				

4.2.2.The Technology Management Role

The Technology Management Role is calculated in relation to five CSFs, as shown in the Table 4 below, to describe the role's effectiveness.

Table 4. Total effectiveness of the Technology Management Role. Source primary data 2019

	N	Minimum	Maximum	Mean	Std. Deviation
Hardware and Software	156	1.00	5.00	2.6923	.77556
Data Accuracy	156	1.00	5.00	3.3590	.66185
Configuration	156	2.00	5.00	3.2179	.67485
Monitoring System Performance	156	1.00	4.00	2.9359	.81660
Testing & Troubleshooting	156	2.00	5.00	3.2308	.72598
Valid N (listwise)	156				

As the overall result indicates, EEU needs improvement in giving serious attention for system configuration (3.2179) and managing tests unique to the ERP system (3.2308), mainly the organization has to work more on cleansing and loading the existing legacy data for data accuracy and quality.

4.2.3.The Process Management Role

As shown in Table 5, four CSFs are measured to calculate the effectiveness of the Process Management Role. The result shows Consultants Support scored (3.0769) and is the least

effective among the rest CSFs grouped in the category. The rest CSFs in this category get mean values of Customization (2.7564), Vendors Support (2.8269), and Standardization (2.9744).

Table 5. Total effectiveness of the Process Management Role. Source primary data 2019

	N	Minimum	Maximum	Mean	Std. Deviation
Consultants Support	156	1.00	5.00	3.0769	.83116
Vendors Support	156	1.00	5.00	2.8269	.84367
Customization	156	1.00	5.00	2.7564	.90427
Standardization	156	2.00	5.00	2.9744	.71796
Valid N (listwise)	156				

Therefore, the Consultant Support needs the most improvement in considering quick and substantial transfer of knowledge related to others CSFs of this category.

4.2.4.The Change Management Role

In order to measure the effectiveness of the Change Management Role, five CSFs are grouped in this category.

Table 6. Total effectiveness of the Change Management Role. Source primary data 2019

	N	Minimum	Maximum	Mean	Std. Deviation
Users Involvement	156	1.00	5.00	3.3333	1.02443
Organizational Culture	156	1.00	5.00	3.7628	1.07230
Education & Training	156	1.00	5.00	4.1410	.99967
Discipline	156	2.00	5.00	3.6154	.86853
Commitment	156	1.00	5.00	3.2949	.95861
Valid N (listwise)	156				

The result shows that User Involvement, Organizational Culture, Education and Training, Discipline, and Commitment are not effective. In this category, as shown in Table 6, Education and Training is the least effective among the grouped CSFs which scored the largest mean value (4.1410), and the rest get mean values of change in Organizational Culture (3.7628), Discipline improvement (3.6154), Users Involvement (3.3333), and Commitment sustainment (3.2949). This indicates, the overall change management practices are the most crucial role area that EEU needs the most attention and improvement related to the others roles.

4.2.5. The Project Management Role

This role has the greatest numbers of CSFs compare to the others management roles, that is, it is a group of eight CSFs. Their measurement is presented in the Table 7 below.

Table 7. Total effectiveness of the Project Management Role. Source primary data 2019

	N	Minimum	Maximum	Mean	Std. Deviation
Needs Assessment	156	1.00	4.00	2.8718	.90673
Competent Staff	156	2.00	4.00	2.7436	.69905
Team Composition	156	1.00	4.00	2.4744	.77417
Formalized Plan	156	1.00	4.00	2.5256	.70435
Coordination	156	1.00	4.00	2.5769	.72769
Partnership	156	1.00	4.00	3.0641	.63935
Scope Management	156	1.00	4.00	3.1154	.70903
Leadership	156	2.00	4.00	3.3013	.58387
Valid N (listwise)	156				

The result shows that Needs Assessment (2.8718), Competent Staff (2.7436), Coordination (2.5769), Formalized Plan (2.5256), Team Composition (2.4744) are scored the highest effectiveness. Team Composition is the best scored CSF among the group as it scored the least mean score. The result also shows Partnership (3.0641) and Scope Management (3.1154) are less effective, and Leadership (3.3013) needs the most attention.

4.2.6. ERP Implementation Success

As shown in the below Table 8, the mean value of ERP Implementation Success obtained by the respondents believe has a mean value of 3.0577.

Table 8. Total ERP Implementation Success. Source primary data 2019

	N	Minimum	Maximum	Mean	Std. Deviation
ERP Implementation Success	156	2.00	4.00	3.0577	.41333
Valid N (listwise)	156				

This result indicates that the ERP implementation is not adequately successful. Because, the mean indicates the overall ERP Implementation Success is above the adequate scale of 3.

4.3. Reliability Test

The questionnaires in this study contained six questions on Top Management Role, five on Technology Management Role, four on Process Management Role, five on Change Management Role, and eight on Project Management Role representing the independent variables and one question on the dependent variable overall ERP implementation success which makes a total of 29 questions. In terms of reliability the most important figure is the Alpha value. This is Cronbach's alpha coefficient, which in this case is .783. This value is above .7, so the scale can be considered reliable with our sample.

Table 9. Reliability Statistics. Source SPSS 2019

Reliability Statistics	
Cronbach's Alpha	N of Items
.783	6

The Corrected Item-Total Correlation result, Table 10, also shows all values of the scales reliability is .748 maximum and .564 minimum.

Table 10. Item-Total Statistics. Source SPSS 2019

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
ERP Implementation Success	86.5128	114.019	.748	.791
Total Top Management Role	70.9487	86.023	.628	.728
Total Technology Management Role	74.1346	88.156	.622	.731
Total Process Management Role	77.9359	93.454	.564	.747
Total Change Management Role	71.4231	72.104	.546	.764
Total Project Management Role	66.8974	71.422	.640	.724

This indicates the degree to which each item correlates with the total score. According to Pallant (2005), low values (less than .3) indicate that the item is measuring something different from the scale as a whole. Therefore the study's scale fulfills the reliability requirement.

4.4. Validity Test

The questions in the questionnaire are adapted from Frimpon's restructured "role" model. In the model, 28 CSFs were identified from various research works and complied to formulate the ERP implementation management 'Role' model. Thus, the criteria that the CSFs must fulfill are adapted from it and modified by the researcher of this study. In addition, the research questions are approved by the advisor of this research work.

4.5. Correlation Analysis

In order to explore the strength of the relationship between the dependent variable (ERP Implementation Success) and independent variables (the five Management Roles), Pearson correlation is used.

According to Pallant (2005), Pearson Correlation is used to explore the strength of the relationship between two continuous variables. This gives an indication of both the direction (positive or negative) and the strength of the relationship. A positive correlation indicates that as one variable increases, so does the other. A negative correlation indicates that as one variable increases the other decreases. A perfect correlation of 1 or -1 indicates that the value of one variable can be determined exactly by knowing the value on the other variable. On the other hand, a correlation of 0 indicates no relationship between the two variables. Pallant also suggested that:

- if the correlation value is between .10 and .29, it indicates small relationship,
- if the correlation value is between .30 and .49, it indicates medium relationship, and
- if the correlation value is between .50 and 1.0, it indicates large relationship.

The results indicate that the highest correlation between the Total ERP Implementation Success and the independent variables effectiveness; i.e., .541 with Top Management, .597 with Technology Management, .492 with Process Management, .549 with Change Management, and .627 with Project Management Role (see Table 11). All the results are between 0 and +1 and it

can be concluded that, there is a strong and positive relationship between the ERP Implementation Success and the effectiveness of the five Management Roles.

Table 11. Correlation Statistics. Source SPSS 2019

		Correlations					
		ERP Implement ation Success	Total Top Manageme nt Role	Total Technology Manageme nt Role	Total Process Manageme nt Role	Total Change Manageme nt Role	Total Project Manage ment Role
ERP Implementation Success	Pearson Correlation	1	.541**	.597**	.492**	.549**	.627**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	156	156	156	156	156	156
Total Top Management Role	Pearson Correlation	.541**	1	.687**	.389**	.357**	.534**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	156	156	156	156	156	156
Total Technology Management Role	Pearson Correlation	.597**	.687**	1	.448**	.335**	.495**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	156	156	156	156	156	156
Total Process Management Role	Pearson Correlation	.492**	.389**	.448**	1	.498**	.401**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	N	156	156	156	156	156	156
Total Change Management Role	Pearson Correlation	.549**	.357**	.335**	.498**	1	.493**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	156	156	156	156	156	156
Total Project Management Role	Pearson Correlation	.627**	.534**	.495**	.401**	.493**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	156	156	156	156	156	156

** . Correlation is significant at the 0.01 level (2-tailed).

This case study tries to examine the relationship between the ERP Implementation and the five Management Roles by formulating the following hypotheses;

H1. Effective top management role has a strong and positive relationship with ERP implementation success.

H2. Effective technology management role has a strong and positive relationship with ERP implementation success.

H3. Effective process management role has a strong and positive relationship with ERP implementation success.

H4. Effective change management role has a strong and positive relationship with ERP implementation success.

H5. Effective project management role has a strong and positive relationship with ERP implementation success.

As shown in the correlation statistics result, 156 cases are included and there is no missing information on all variables, the direction and strength of the relationship between the dependent variables and all independent variables is positive and strong, and correlation is significant at the 0.01 level (2-tailed).

To get an idea of how much variance the variables share by calculating the coefficient of determination, we can square their value (multiply it by itself) and convert this to 'percentage of variance' just multiply by 100 (Pallant, 2005). Therefore;

- Top Management Role has .541, thus, its coefficient of determination is 29.27%,
- Technology Management Role has .597, thus, its coefficient of determination is 35.64%,
- Process Management Role has .492, thus, its coefficient of determination is 24.21%,
- Change Management Role has .549, thus, its coefficient of determination is 30.14%, and
- Project Management Role has .627, thus, its coefficient of determination is 39.31%.

These results indicate all the independent variables have a respectable amount of variance to explain the ERP Implementation Success. Therefore, all the hypotheses of this case study are accepted.

4.6. Qualitative Analysis

This section presents the qualitative analysis of the open ended questions and the interview for the research's variables. The open ended questionnaires were distributed for eight core team members, and semi structured interviews were held with one application project manager and two implementation partners.

4.6.1.Top Management Role

Most of the results of the respondent's data show that there were limitations in all CSFs related to the Top Management Role. Goals and Vision have to be clear, strategies and action plans should be put clearly and communicated properly, the project team need to be empowered, the top management support and involvement needs improvement, and the top management members should develop their business, technical and personal managerial competencies to advocate the ERP project.

4.6.2.Technology Management Role

The result of this group of CSFs indicates Hardware and Software fitness to the legacy system has not problem, however, the company needs more efforts to improve on the rest to be effective. Data from existing legacy systems should be organized and properly cleansed, serious attention have to be given to the conference room pilot, operational criteria should be used to measure against the production system, and development and testing perspectives unique to ERP projects have to be well-thought-out and managed.

4.6.3.Process Management Role

The respondent's opinion shows the Process Management Role is not effective, but vendor selection and standardization is better than other CSFs. The main problem in this category is Consultant support, considering quick and substantial transfer of knowledge from consultants to qualified staff in creating the possibility for them to participate to the tasks of external consultants or even to take them over. The respondents recommended that the company should assign new consultant, because the previous consultancy contract agreement has been terminated. The management of the tradeoffs between customization and standardization have been addressed upfront versus during mid-deployment, in order to have better control over the costs.

4.6.4.Change Management Role

All the respondents are disagreed with the effectiveness of this management role. They recommended that users involvement have to be improved to achieve better system quality, use and acceptance; the mentality change from using reams of paper to electronic media have to be encouraged; education and training have to be sufficiently given to users; and the company should work hard in attitudinal changes and organizational commitment have to be sustain both at top and middle level management.

4.6.5.Project Management Role

The result from the respondent's data shows the selection of competent team and the composition of the project team is good. But there are more things to be improved. The recommendations given by the respondents indicate; needs assessment should have been refined to a set of specific institutional acceptance criteria at an early phase of the project; the project should have a well-defined plan/schedule for all the activities involved in the ERP implementation; coordination and communication have to be improved among the project team and the whole organization; scope management needs improvement; and more developmental efforts have to be taken to improve leadership skills.

4.6.6.ERP Implementation Success

All the respondents disagreed the effectiveness of the overall ERP implementation and recommended that the company should focus on more human resources development areas. The project, technology and process aspects also need careful attention.

4.6.7.Interview Responses

The result of the semi structured interviews also shows that the effectiveness of the five management roles is highly related to the success of ERP implementation and the five management roles can equally influence the success. According to their response, the day to day challenges faced when implementing ERP system need to be monitored, captured, analyzed and proper corrective actions should have to be taken. Otherwise, the result would severely harm the organization. They have also mentioned that the company needs more things to do regarding the five management roles, Top Management, Technology Management, Process Management, Change Management and Project Management roles areas.

4.7. Discussion on the Findings

ERP is an enterprise-wide information system designed to coordinate all the resources, information, and activities needed to complete business processes. It supports the business system that maintains a single database for a variety of business functions such as Manufacturing, Supply Chain Management, Financials, Projects, Human Resources, Enterprise Asset Management, Quality Management, Customer Relationship Management, and Decision Support Systems. Thus ERP system implementations are huge investments and consume an organization's financial resources and are in turn expected to bring about benefits in operational effectiveness, accountability, transparency, decision making and client satisfaction.

Many research works revealed that there is no easy way to implement an ERP system because the implementation process is a disruptive undertaking for any organization. It requires steady leadership, significant resource investment, the right system integrator as well as a detail project plan and communication strategy. Ultimately, ERP success requires a thorough analysis and integration of people, processes and technology.

Therefore, Top Management, Technology Management, Process Management, Change Management, and Project Management roles are the pillars that shoulder the burden of the implementation of the ERP process. A weakness in any of the pillars can result in a failure. The findings of this case study show that the performance of the organization on these management roles is below average.

EEU has more to do in order for the top management role to be effective. The top management requires articulating a business vision to the organization, identifying clear goals and objectives (Shanks et al., 2000), and providing a clear link between business goals and IS strategy (Finney & Corbett, 2007). The choice of the correct ERP version has to be decided upon. An older version may result in frequent updating (Esteves & Pastor, 2000). Clear strategies must be outlined to benefit from introducing a new system and completely forgetting about the legacy system (Finney & Corbett, 2007). Strong and committed leadership at the top management level is essential to the success of an ERP implementation (Finney & Corbett, 2007). Project team members must be empowered to make quick decisions to reduce delays in implementation related with slow decision-making. The individual should possess strong leadership skills, as well as

business, technical and personal managerial competencies to advocate the ERP project (Finney & Corbett, 2007).

Management must make a careful choice of an ERP package that best matches the legacy systems, e.g. the hardware platform, databases and operating systems (Singhalet al., 2011). Data must be cleansed and transferred to the ERP system to ensure no disruption to performance, high quality data is very important in the integrated environment of an ERP system (Shanks et al., 2000). Serious attention should be given to the conference room pilot, which provides a demonstration of the ERP system that users can test drive before the system configuration is locked down (Swartz & Orgill, 2001). Project management-based criteria should be used to measure against completion dates, costs, and quality and operational criteria should be used to measure against the production system (Nah et al., 2003). The monitoring of performance are very critical factors in ensuring the success of any organization (Yingjie, 2005). Development and testing perspectives unique to ERP projects must be well-thought-out and managed (Nah et al., 2003). When these criteria are fulfilled, the technology management roles become effective.

In order for the process management role to be effective; it is important to arrange for knowledge transfer from the consultant to the company so as to decrease the dependency on the vendor/consultant (Finney & Corbett, 2007). Software vendors should be carefully selected since they play a crucial part in shaping the ultimate outcome of the implementation (Panorama Consulting Solutions, 2019). Organizations should be willing to change their businesses to fit the software in order to minimize the degree of customizations needed (Shanks et al., 2000). Organizations should be committed to the idea of implementing the unadulterated or basic version with no or minimal customization (Finney & Corbett, 2007). The management of the tradeoffs between customization and standardization is a key to a successful implementation (Finney & Corbett, 2007).

This study indicates the change management role needs great attention. A major cause of ERP failure is lack of employee involvement (Barker & Frolick, 2003). Statistical results show that lack of end user involvement can cause the ERP process to have difficulties (Lee & Lee, 2001). A culture with shared values and a strong corporate identity that is conducive to change is critical. In the local context, the mentality change from using reams of paper to electronic media should

be encouraged, and ERP facilitates that (Nah et al., 2003). The most measured subset of costs is the initial software development efforts while the most uncertain and often the largest cost is long-term maintenance and training (Hubbard, 2007). Users can only gain an appreciation of the utility of the system only if they are well trained to use it. Insufficient training causes significant negative impact on ERP systems implementation (Lee & Lee, 2001). Lack of discipline, resistance, and lack of broad-based company commitment are the major factors that slow down the process of implementation (Zhang et al., 2003). The need for organizational commitment should be stressed during strategy sessions because a lax in that can scupper the project (Zhang et al., 2003).

The project management role is also the other area that needs more improvement as the result of this study. One of the first steps involves evaluating the needs and requirements that will drive the implementation of an ERP system. The basic description of needs should be refined to a set of specific institutional acceptance criteria at an early phase of the project. This statement will be used at a later date to help evaluate the success of the project in meeting these goals (Swartz & Orgill, 2001). A dedicated and competent staff is a must (Esteves & Pastor, 2000; Wen et al., 2003). ERP projects typically require some combination of business, information technology, vendor, and consulting support, which is the integration of third-party consultants within the team and the retention within the organization of the relevant ERP knowledge (Esteves & Pastor, 2000). A single integrated project plan, not a collection of independent plans, can't be rolled into a summary report to management (Swartz & Orgill, 2001). Evidence shows that the majority of projects fail to finish the activities on time and within budget (Esteves & Pastor, 2000). Good coordination and communication between implementation partners are essential (Nah et al., 2003). The communication effort should be done in a regular basis during the implementation phase (Esteves & Pastor, 2000). In order to successfully accomplish the decision to implement an ERP system, the effective project management comes into play to plan, coordinate and control such an intricate project (Yingjie, 2005). The project leadership must engender trust and avoid attrition and unnecessary competition among members (Esteves & Pastor, 2000). Scope management is related with concerns of project goals clarification and their congruence with the organizational mission and strategic goals. Avoid Scope creep, which is clearly delineating and effectively limiting the scope of the project (Swartz & Orgill, 2001). The Project leader needs leadership skills and respect of project members and administration (Swartz & Orgill, 2001).

Chapter Five: Conclusion and Recommendation

5.1. Conclusion

This case study tried to assess ERP implementation success based on five management roles and draw explanations based on those management roles; by using a review of related literatures on CSFs criteria for ERP system implementation in order to develop research framework that associate the management roles effectiveness with the ERP implementation success; and also by using various data collection methods (qualitative and quantitative) in combination with nonrandom sampling techniques to select 167 samples and using the opinions of the project managers, core team members, end users and consultants/implementation partners assessed the implementation success, test the relationship and draw explanation.

Thus the study's major findings are:

1. It describes the overall ERP implementation success based on those management roles is below average.
2. It examined the relationship of ERP implementation success with CSFs criteria (the five management roles) by exploring the correlation statistics using SPSS 20 software, thus, the result showed there is a strong and positive relationship between ERP implementation success and the effectiveness of each management roles.
3. All the five management roles have a respectable amount of variance to explain the ERP Implementation Success.

5.2. Recommendation

EEU can consider the five management roles effectiveness identified in this study as input to improve the second phase of the project. Specially;

- The Top Management should work hard in; outlining the best strategies by analyzing and choosing from the possible alternatives; supporting the project with strong and committed leadership; empowering the project team for timely decision making; and championing the project by developing the required transformational leadership skills.

- The company should give more attention for the of accuracy legacy data to test the system with proper knowledge to manage troubleshooting before configuration locked down.
- The company should consider the essence of knowledge transfer gained from the external consultants to decrease the dependency on them.
- Changes have to be well managed by involving and participating users of the system for shared values, attitudinal changes, sustained commitment, and sufficient training and education.
- The company should develop the competency of project management in building strong partnership with consultants and vendors, scope definition and control, and the ability to effectively and efficiently run such complex projects.

Each management roles can be a research topic for further research. Other Ethiopian organizations planning to implement ERPsystem can consider implementing all management roles identified in this study asinput for managing their ERP project.

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Annex 1 – Questionnaire for End Users
Addis Ababa University
School of Commerce

Dear Respondents

As a partial fulfillment of Master's Degree in Project Management at Addis Ababa University, School of Commerce, I, Yohannes Mulushoa am conducting a case study on "Assessment of Management Roles Effectiveness for Enterprise Resource Planning (ERP) System Implementation Project Success: The Case of Ethiopian Electric Utility (EEU) ERP Project". I kindly request your assistance to fill out the questionnaire. The information provided will only be used for this case study and your response is highly valued in the success of this research paper. The questionnaire is anonymous and please do not indicate your name.

The questionnaire is based on your experience and involvement in EEU's ERP implementation. The questionnaire is designed to evaluate the success of the ERP implementation by selected five management roles. The findings of the study will propose possible solutions to the challenges and setbacks encountered during the implementations and denote lessons learned for future endeavors.

In this questionnaire the following definitions are applied:

Effective Top Management Role: The top management role includes clearly articulating goals and vision, approving the correct ERP version, outlining implementation strategy, support in cash and kind, delegate the decisions, and champion/advocate the project.

Effective Technology Management Role: The technology management roles include hardware and software fitness, data accuracy, configuration, monitor system performance, and test/troubleshoot system.

Effective Process Management Role: The process management roles include consultant support, vendor support, standardization, and customization.

Effective Change Management Role: The change management role includes user involvement, organizational culture, education and training, discipline, and commitment.

Effective Project ManagementRole: The project management role includes needs assessment, competent team, heterogeneous team, formalizes plan, coordination, partnership, scope management, and leadership.

Age 1.20-30 2.30-40 3.40-50 4. 50-60

Gender 1.Female 2. Male

Year of Experience 1.0-10 years 2.10-20 years 3.20-30 years 4. 30-40 years

Indicate the highest level of education

1. High School 2. Diploma 3.BA Degree 4.Masters 5. PHD

In what ERP Module you are working

1. Enterprise Core Component (ECC) 2. Customer Centric Application (CCA)

No.	The Top Management Role	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	Goals and Vision have been clearly articulated by the top mangement, in order to reduce the effort of capturing the functionality of the ERP business model and therefore minimize the customization effort.					
2	The top management has chosen the correct ERP version in order to minimize frequent updating.					
3	The top management has outlined implementation strategy to benefit from introducing a new system and completely forgetting about the legacy system.					
4	The top management effectively support for accomplishing project goals and objectives and aligning these with strategic business goals in terms of their own involvement and the willingness to allocate valuable organizational resources.					
5	The top management has empowered the project team members to make quick decisions to reduce delays in implementation related with slow decision-making.					
6	The top management possess strong leadership skills, as well as business, technical and personal managerial competencies to advocate the ERP project.					

No.	The Technology Management Role	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	The selected ERP system and the hardware best matches the legacy systems.					
2	Data loaded from existing legacy systems is cleansed, that is, it is accurate and of high quality					
3	Serious attention have been given to the conference room pilot, which provides a demonstration of the ERP system that users can test drive before the system configuration is locked down.					
4	The progress of the ERP project have been monitored and tracked to measure against completion dates, costs, and quality and operational criteria should be used to measure against the production system.					
5	Development and testing perspectives unique to ERP projects have been well-thought-out and managed.					

No.	The Process Management Role	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	Consultat support have been effective, considering quick and substantial transfer of knowledge from consultants to qualified staff in creating the possibility for them to participate to the tasks of external consultants or even to take them over.					
2	Software vendors have been carefully selected since they play a crucial part in shaping the ultimate outcome of the implementation.					
3	The organization have been committed to the idea of implementing the unadulterated or basic version with no or minimal customization.					
4	The management of the tradeoffs between customization and standardization have been addressed upfront versus during mid-deployment, in order to have better control over the costs.					

No.	The Change Management Role	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	Users involvement have been effective in achieving better system quality, use and acceptance.					
2	Enterprise-wide culture and structure change have been managed, the mentality change from using reams of paper to electronic media have been encouraged, and ERP facilitates that.					
3	Education and training have been sufficient thus users have gained an appreciation of the utility of the system.					
4	The required discipline have been improved through indoctrination at meetings to address attitudinal changes.					
5	The need for organizational commitment have been sustain both at top and middle level management during the implementation.					

No.	The Project Management Role	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	The basic description of needs have been refined to a set of specific institutional acceptance criteria at an early phase of the project.					
2	A dedicated and competent staff have maintained.					
3	ERP project team have been a combination of business, information technology, vendor, and consulting support.					
4	The project has a well-defined plan/schedule for all the activities involved in the ERP implementation, with an appropriate allocation of budget and resources for these activities.					
5	There have been a good coordination and communication among the implementation partners, the project team and the whole organization.					
6	The project leadership engender trust and avoid attrition and unnecessary competition among members.					
7	The scope management have been effective in scope definition and subsequent scope control.					
8	Leadership have been effective in leadership skills, respect of project members and administration.					

No.	ERP Implementation Success	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	The overall ERP implementation have been effective regarding assuring the intended benefits can be realized successfully.					

Annex 2 – Questionnaire for Package Leads and Core Team Members

Addis Ababa University

School of Commerce

Dear Respondents

As a partial fulfillment of Master's Degree in Project Management at Addis Ababa University, School of Commerce, I, Yohannes Mulushoa am conducting a case study on "Assessment of Management Roles Effectiveness for Enterprise Resource Planning (ERP) System Implementation Project Success: The Case of Ethiopian Electric Utility (EEU) ERP Project". I kindly request your assistance to fill out the questionnaire. The information provided will only be used for this case study and your response is highly valued in the success of this research paper. The questionnaire is anonymous and please do not indicate your name.

The questionnaire is based on your experience and involvement in EEU's ERP implementation. The questionnaire is designed to evaluate the success of the ERP implementation by selected five management roles. The findings of the study will propose possible solutions to the challenges and setbacks encountered during the implementations and denote lessons learned for future endeavors.

Age 1.20-30 2.30-40 3.40-50 4. 50-60

Gender 1.Female 2. Male

Year of Experience 1.0-10 years 2.10-20 years 3.20-30 years 4. 30-40 years

Indicate the highest level of education

1. High School 2. Diploma 3.BA Degree 4.Masters 5. PHD

In which functional area(s) are you a process expert _____

As a member of Implementation Team and by applying the definitions provided for each management roles, please provide your views:

Effective Top Management Role: The top management role includes clearly articulating goals and vision, approving the correct ERP version, outlining implementation strategy, support in cash and kind, delegate the decisions, and champion/advocate the project.

What worked well? _____

What could have been done better? _____

What recommendations do you have for future endeavors? _____

Effective Technology ManagementRole: The technology management roles include hardware and software fitness, data accuracy, configuration, monitor system performance, and test/troubleshoot system.

What worked well? _____

What could have been done better? _____

What recommendations do you have for future endeavors? _____

Effective Process ManagementRole: The process management roles include consultant support, vendor support, standardization, and customization.

What worked well? _____

What could have been done better? _____

What recommendations do you have for future endeavors? _____

Effective Change ManagementRole: The change management role includes user involvement, organizational culture, education and training, discipline, and commitment.

What worked well? _____

What could have been done better? _____

What recommendations do you have for future endeavors? _____

Effective Project Management Role: The project management role includes needs assessment, competent team, heterogeneous team, formalize plan, coordination, partnership, scope management, and leadership.

What worked well? _____

What could have been done better? _____

What recommendations do you have for future endeavors? _____

Overall Effectiveness of ERP Implementation: Please provide comments on the overall effectiveness of the ERP implementation regarding success in assuring the intended benefits can be realized.

What worked well? _____

What could have been done better? _____

What recommendations do you have for future endeavors? _____