ADDIS ABABA UNIVERSITY

SCHOOL of COMMERCE

LOGISTICS AND SUPPLY CHAIN MANAGEMENT DEPARTMENT

Assessment of Critical Success Factors of ERP Implementation: perception survey of warehousing operation employees of ethio telecom

A thesis submitted to Addis Ababa University School of Commerce in partial fulfillment of the requirements for the Degree of Masters of Art in Logistics and Supply Chain Management.

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ADDIS ABABA UNIVERSITY

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"Assessment of Critical success factors of ERP implementation: perception of warehousing operation employees of ethio telecom in warehousing."

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Declaration

I, Haregewoin Tadese declare that this paper is a result of my independent research work on the topic entitled "***Assessment of Critical success factors of ERP implementation: perception of warehousing operation employees of ethio telecom***" in partial fulfillment of the requirements for the Degree of Masters of Art in Logistics and Supply Chain Management at Addis Ababa University. This work has not been submitted for a degree to any other university or it hasn't been published previously. All the references are also duly acknowledged.

Haregewoin Tadese

Signature_____

Date _____

Confirmation

This is to certify that **Haregewoin Tadese has** carried out this research work on the topic entitled "***Assessment of Critical success factors of ERP implementation: perception of warehousing operation employees of ethio telecom***" under my supervision. This work is original in nature and has not been presented for a degree or masters in any University and haven't been published previously it can be submitted for the partial fulfillment of the requirements for the award of the degree of Masters of Art in Logistics and Supply Chain Management.

Mengistu Bogale (**Dr.**)

Signature_____

Date _____

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Abstract

Firms now a day are pursuing and using different information technology application that simplify their operation and make them competitive. ERP is an IT software application with a lot of benefit packages and it is widely accepted and implemented by different companies since 1990s. This study was conducted with the pursuit of assessing the perception of warehousing operation employees of ethio telecom on critical success factors of ERP implementation. The study tries to analyze factors that made ERP implementation successful in the company warehouses located in Addis Abeba and examine the association between critical success factors and successfulness of ERP. Success indicators of ERP system were also assessed. Primary data was collected thorough structured questionnaire. While secondary data was taken from ERP support team section of the company. 76 questionnaires out of 83 distributed questionnaires were returned and analyzed using Descriptive and explanatory research design by applying SPSS version 20. The findings of multiple regression analysis done on SPSS showed that all the nine critical success factors (top management commitment and support, project management, user training, data accuracy, effective communication, change management clear goals and objectives, perceived usefulness and consultant support) were found to have a positive relationship with success fullness of ERP in ethio telecom warehouses. And except for change management the 8 variables (CSFS) were found to be the significant predictors of successfulness of ERP implementation in ethio telecom warehouses. In order to get the perceived advantages of ERP the company must work on change management and should also work more on the rest critical success factors. With regard to success indicators of ERP system all the 10 constructed success measurements with the mean value above 4 were accepted as success indicator by the respondents. This study can be further investigated with larger sample size by incorporating different companies' warehouses in the future.

Key words*:* Critical success factors, ERP & Success indicators of ERP

Acronyms

IS	Information System
I T	Information Technology
ERP	Enterprise Resource Planning
MRPII	Manufacturing Resource Planning
MRP	Material Requirement Planning
TAM	Technological Acceptance Model
CSFS	critical success factors

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CHAPTER ONE: INTRODUCTION

1.1 Back Ground of the Study

In order to survive and compete in this volatile market companies have no choice but to be flexible cost effective and always seek new way of doing business that will maximize their profit Companies are now days are using different IT applications which are meant to simplify their day to day activity. And Enterprise resource planning is one of the information technologies which is adopted by different companies to get business intelligence. Enterprise Resource Planning (ERP) built on the framework based on industry best practices, is a packaged software applications that can be configured to meet functional requirements of an organization, that integrate information from various disparate sources such as customers, supply chain, human resources, and financial accounting to make up the value chain of the enterprise allowing an organization to become significantly compliant and effective (Upadhyay, Basu, Adhikary & Dan, 2010). ERP system is analogous to the internal technological hub of a company. When fully implemented as an integrated suite, it can be thought of as a company's central repository (Nah, 2002). This integrated system gives different strategic and competitive advantage to a company.

Nowadays, ERP systems are being increasingly adopted by organizations of any kind and size, in order to avoid technical obsolesce and create sustainable competitive advantages (Maditinos, Chatzoudes & Tsairidis, 2011). Many companies are using ERP software to streamline and integrate their enterprise wide information and process of their divisions like finance, human resource, manufacturing logistics, &marketing. The key underlying benefit of ERP implementation is the capability to plan and integrate enterprise-wide resources at the level of applications, systems of a business. It provides an understanding on the way business processes and enterprise policies are structured (AlSudairi, 2013).

According to Umble, Haft & Umble (2003) ERP provides two major benefits that do not exist in non-integrated departmental systems: (1) a unified enterprise view of the business

that encompasses all functions and departments; and (2) An enterprise database where all business transactions are entered, recorded, processed, monitored, and reported. This unified view increases the requirement for, and the extent of, interdepartmental cooperation and coordination. So it enables companies to achieve their objectives of increased communication and responsiveness to all stakeholders. ERP also resulted in a reduction in inventory because material-management planners had access to more accurate data such as how much inventory was already in the pipeline and could do a better job forecasting future demand (Umble *et al*., 2003).

ERP if implemented effectively it will help a company to have uniform information in addition to this it has also other important benefits like reduced costs resulted from high system quality.

Investing in ERP deployment is found to be significant since it integrates and reengineer business process in one company. ERP can be used not only in manufacturing companies, but in any company that wants to enhance competitiveness by most effectively using all its assets, including information (Umble *et al*., 2003).ERP system with its ability to share information in today's business world becomes an invaluable tool, which provides various departments with the capacity to work in concert and communicate across a common interface (Tarn, Yen& Beaumont, 2002).

It is certainly true that enterprise systems can deliver great rewards, but the risks they carry are equally great. When considering and implementing an enterprise system, managers need to be careful that their enthusiasm about the benefits does not blind them to the hazards (Davenport 1989). Despite the attributes and major advantages provided by ERP systems, the implementation of such systems is not always effective. ERP systems often fail to meet organizational goals soon after their implementation. The cause of the general disappointment regarding ERP system effectiveness lies in a number of reasons, including a misconception about the system's potential (Maditinos *et.al.*, 2011). Although ERP

systems are integrated and consistent but on the other hand it is risky and complicated with software and resources (AlSudairi, 2013).

CSFs for ERP implementation bring a concept that helps organization identify critical issues that affect the process of implementation (Nagi, Law & Wat, 2008). ERP implementation is a process where business process of a company aligns with ERP system. Critical success factors of ERP system implementation are the factors, where the ERP system implementation can be measured to its success. Measurement of ERP implementation in figures or statistically is difficult task but it should be measure with these factors that how much it is working and how these factors are implemented successfully. And to get the best out of this integrated system (ERP) in warehousing it is mandatory to manage the implementation process and explore factors that are said to be critical for success fullness of ERP (AlSudairi, 2013).

1.2 Statement of the Problem

Enterprise Resource Planning (ERP) system assists the organizations to automate their business processes by coordinating and integrating the information between departments, which is one of the big benefits of this system (Monk &Wagner, 2009). It provides the organization with cross-functional enterprise software with integrated modules for each department in the organization with a unified database for all of them, which makes it easier for the company to manage, execute, store data and monitor core business processes. The integration it brings and provides is very important for any business, since the ERP system solves the silo effect that legacy systems have, because they were developed in isolation from each other (Tarhini, Ammar, Tarhini& Masa'deh, 2015).

According to Monk & Wagner (2013) the significance of ERP lies in its many benefits. Recall that integrated information systems can lead to more efficient business processes that cost less than those in un integrated systems. ERP system acquisition and implementation generally enhance productivity and working quality, since the system offers standardization and simplification in multiple, complicated operational procedures across the company. Moreover, information can easily be transferred, shared and

exchanged among users who are working at different business divisions (Maditinos *et al*., 2011).

Benefits of a properly selected and implemented ERP system can be significant leading to considerable reductions in inventory cost, raw material costs, lead time for customers, production time and production costs (Somer & Nelson, 2001). ERP is the vehicle for getting valid plans and schedules, but not just of materials and production. It also means valid schedules of shipments to customers, of personnel and equipment requirements, of required product development resources, and of cash flow and profit (Wallace & Kremzar, 2001). Enterprise Resource Planning has proven itself to be the foundation, the bedrock, for supply chain management. It's the glue that helps bind the company together with its customers, distributors, and suppliers all on a coordinated, cooperative basis (Wallace & Kremzar, 2001).

Despite the potential benefits of ERP there are situations where organizations were not successful in reaping the potential benefits that motivated them to make large investments in ERP implementation and faced several of these challenges such as:., (i) the technology is complex, (ii) the implementation requires changes to the existing processes and structures which are harder and take time, (iii) there is a potential for behavioral resistance to change (AlSudairi, 2013).

Implementing an ERP system is not an inexpensive or risk-free venture. In fact, 65% of executives believe that ERP systems have at least a moderate chance of hurting their businesses because of the potential for implementation problems (Umble *et al*., 2003). ERP system implementation is a very complicated process as it can take long time with a lot of planning and consultation (Al-sabaawi, 2015).

ERP system implementations are complex undertakings and many of them are unsuccessful. It is therefore important to find out what the critical success factors, or CSFs, that drive ERP project success (Akkermans & Helden, 2002). Through better understanding of the CSFs for the implementation of ERP an organization can determine the corresponding solution to eliminate or avoid the most common failure in implementation (Nagi *et al*., 2008).

Even if different studies have been conducted generally with regard to the subject matter of CSFS of ERP implementation, only few studies are made in Ethiopia with regard to success factors of ERP implementation. Abiyot & Gomez (2012), kibebework (2015) and Sintayehu (2014) are recent studies on ERP implementation on Ethiopian companies. These studies have one common thing in which the studies generally asses ERP implementation of companies which adopt ERP in their system. Engidayehu (2014) in his study tries to generally asses ERP implementation in ethio telecom. Looking at these researches was reasonable and significant to conduct this study which totally and exclusively focuses on CSFS of ERP implementation of Warehouses of ethio telecom that has not been done so far.

In order to get the perceived advantage of ERP, ERP implementation in warehousing needs special attention and should be nurtured. CSFS of ERP implementation are the ingredients to successfulness of ERP implementation. Since most of the materials stored in warehouses of ethio telecom are means of providing service and they are bought in millions the company needs to be able control these materials and know where they are and at what condition are they. This will be done through effective implementation of ERP system.

Though the company has deployed this integrated system in all warehouses of the company we cannot say that it is effectively implemented in which some items stored in warehouses are not received in ERP either intentionally or due to some other reasons like wrong purchase order. And as a result of this some valuable items which can be exchanged in the market were intentionally not received in the system so that the company will not be able to trace these items. The company recently was forced to fire one warehouse admin who was involved in stealing anchor bolt from the warehouse that was not transacted on ERP system. Looking at such occurrences assessing factors (CSFS) that are considered an instrument to effectively implement ERP system is one way of enhancing warehouse efficiency and it was worthwhile to examine these factors. And as the company is striving to be world class service provider it was crucial to assess the perception of the employees on CSFS of ERP implementation and increase responsiveness and satisfy end users through enhanced efficiency of warehouses resulted from identifying those factors that will significantly affect the success fullness of ERP.

1.3 Research Questions

Main research question

- The main research question of this study was; what are the factors that made ERP implementation successful in ethio telecom warehouses?

Sub research questions

- Which factors are more significant to the successfulness of ERP implementation?
- What are the relationship between critical success factors and successfulness of ERP implementation?
- What are the indicators to evaluate ERP implementation success?

1.4 Objective of the Study

General objective

The main objective of this study was to assess the critical success factors of ERP implementation in ethio telecom warehouses.

Specific Objectives

- To examine impact of critical success factors on successfulness of ERP implementation
- To explore the relationship between critical success factors and successfulness of ERP implementation
- To assess success indicators of successful ERP implementation

1.5 Definition of Terms

1.5.1 Definition of ERP

ERP has been defined by different scholars in different ways but it all comes to the same meaning. Enterprise Resource Planning (ERP) system is an information system that helps

the organization to coordinate and integrate information within departments. It is one example of the other Enterprise Systems (ES), such as Supply Chain Management (SCM) system, which manages raw materials and products supply (Tarhini *et al.,* 2015).

1.5.2 Definition of CSFS

The idea of Critical Success Factors (CSFs) approach was first used by Rockhart (1979). Critical success factors can be viewed as situated exemplars that help extend the boundaries of process improvement, and whose effect is much richer if viewed within the context of their importance in each stage of the implementation process (Somers & Nelson, 2001).

1.6 Significance of the study

Findings of this study have both practical and theoretical significances which are;

- The main significance of this study is knowledge and experience sharing with regard to ERP implementation across warehouses of ethio telecom and giving insight to concerned bodies of the organization about factors that affect ERP implementation.
- This study can also be used as to fill literature gap on ERP implementation on warehousing and can be used as a bench mark or as reference for further works which will be conducted on this area. In addition to this, this study can also be used as a guide line for other research's that will be conducted to the future.
- The finding of this study can help warehouse managers and other concerned bodies of the organization in identifying risks and how to mitigate them by giving practical suggestions and information resulted.

1.7 scope of the study

Finding out critical success factors of ERP implementation and assessing success indicators of ERP implementation in ethio telecom warehouses being the main aim of this study, the

study only focused on warehouses of ethio telecom that are located in Addis Abeba. The study did not include regional warehouses of the company throughout the country.

1.8 Organization of the thesis

This study is organized under 5 chapters. The first chapter is about the introduction part which briefly explains about research problem, objective, and significance of the research, scope and limitation. The second chapter is about literature review about ERP, critical success factors and success indicators of ERP implementation. The third chapter discusses in detail about the methodology of the research, data collection and analysis techniques and tools. Chapter four is about analyzing the data, discussion and evaluation of results. Finally, Chapter five contains conclusions, recommendations, limitations and suggestions for further work.

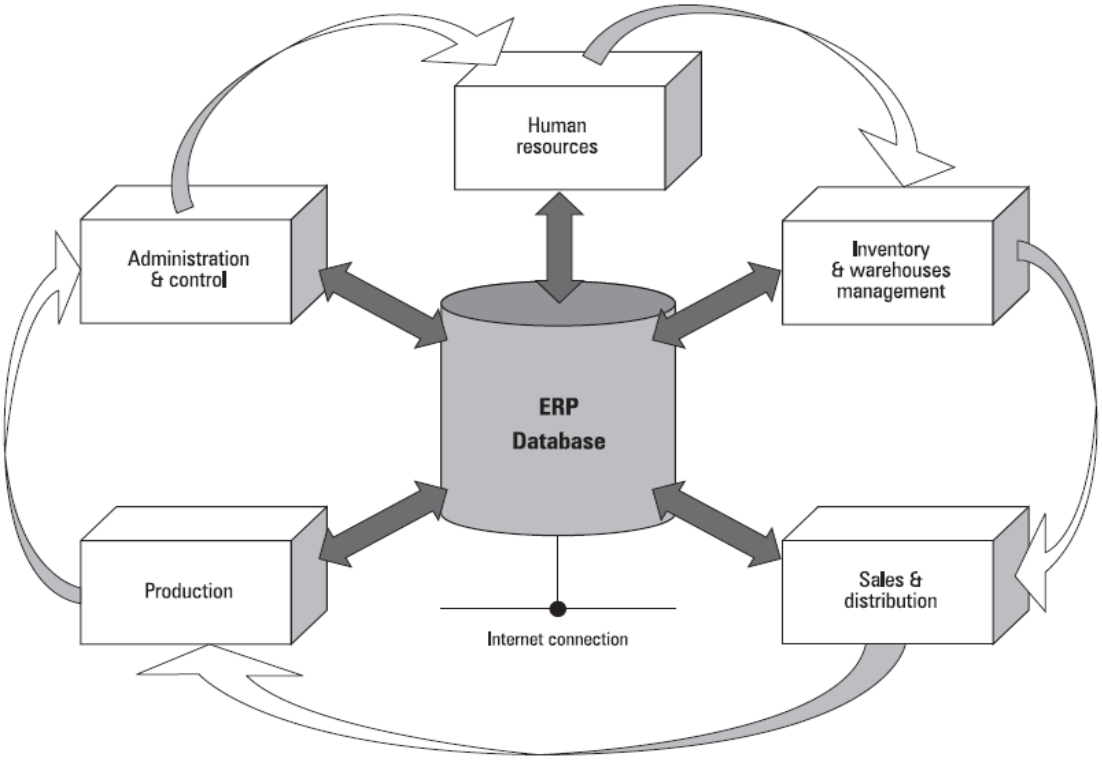
CHAPTER TWO: LITRATURE REVIEW

2.1Defination of Enterprise Resource Planning

Enterprise resource planning systems or enterprise systems are software systems for business management, encompassing modules supporting functional areas such as planning, manufacturing, sales, marketing, distribution, accounting, financial, human resource management, project management, inventory management, service and maintenance, transportation and e-business (Rashid, Hossain & Patrick). According to Somers & Nelson (2001) ERP is software, which attempts to integrate all departments and functions across a company into a single computer system, it is one of the fastest growing segments in the software market, and one of the most important developments in information technology in the last decade. Gartner Institute described ERP as Business strategies and enabling software that Enterprise resource planning systems or enterprise systems are software systems for business management, encompassing modules supporting functional areas such as planning, manufacturing, sales, marketing, distribution, accounting, financial, human resource management, project management, inventory management, service and maintenance, transportation and e-business (Rashid, Hossain & Patrick). According to Somers & Nelson (2001) ERP is software, which attempts to integrate all departments and functions across a company into a single computer system, it is one of the fastest growing segments in the software market, and one of the most important developments in information technology in the last decade. Gartner Institute described ERP as Business strategies and enabling software that integrate manufacturing, financial and distribution functions to dynamically balance and optimize enterprise resources.

ERP (Enterprise Resource Planning) are integrated sets of software developed to share data across the organization for reducing redundant business processes (Alsabawi, 2015). On the other hand Enterprise resource planning (ERP) is an industry term for the broad set of activities supported by multi-module application software that helps a manufacturer or a

service business manage the important parts of its business(Huang and Palvia,2001). Wallace and Kremzar (2001) define ERP as an enterprise-wide set of management tools that balance demand and supply, containing the ability to link customers and suppliers in to a complete supply chain, employing proven business process for decision making and providing high degree of cross functions integration among sales, marketing, manufacturing, operations, logistics, purchasing, finance and human resource there by enabling people to run their business with high levels of customer service and productivity and simultaneously lower costs and inventories and providing the foundation for effective e-commerce the definition emphasize the integration, laid by ERP, between various organizational networks. From the above definition one can understand that ERP is software which mainly stream line information and integrate different business functionalities within the organization and with outside organization.



Figur2.1 ERP architecture (Source: Rizzi & zamboni, 2013)

2.2 Evolution of ERP System

An integrated ERP system is an incredibly complex hardware and software system that was not feasible until the 1990s. Current ERP systems evolved as a result of three things (1) the advancement of hardware and software technology (computing power, memory, and communications) needed to support the system, (2) the development of a vision of integrated information systems, and (3) the reengineering of companies to shift from a functional focus to a business process focus (Monk & Wagner). Starting in the late 1980s and the beginning of the 1990s new software systems known in the industry as enterprise resource planning (ERP) systems have surfaced in the market targeting mainly large complex business organizations. These complex, expensive, powerful, proprietary systems are of the- shelf solutions requiring consultants to tailor and implement them based on the company's requirements. These software solutions, unlike the old, traditional in-house-designed company specific systems, are integrated multi-module commercial packages suitable for tailoring and adding "add-ons" as and when required (Rashid *et al.*, 2002).

The evolution of ERP systems closely followed the spectacular developments in the field of computer hardware and software systems. During the 1960s most organizations designed, developed and implemented centralized computing systems, mostly automating their inventory control systems using inventory control packages (IC). These were legacy systems based on programming languages such as COBOL, ALGOL and FORTRAN. Material requirements planning (MRP) systems were developed in the 1970s which involved mainly planning the product or parts requirements according to the master production schedule.

Following this route new software systems called manufacturing resources planning (MRP II) were introduced in the1980s with an emphasis on optimizing manufacturing processes by synchronizing Œ the materials with production requirements (Rashid *et al*., 2002). MRP II included areas such as shop floor and distribution management, project management, finance, human resource and engineering. ERP systems first appeared in the late 1980s and the beginning of the 1990s with the power of enterprise-wide inter-functional coordination and integration. Based on the technological foundations of MRP and MRP II, ERP systems

integrate business processes including manufacturing, distribution, accounting, and financial, human resource management, project management, inventory management, service and maintenance, and transportation, providing accessibility, visibility and consistency across the enterprise (Rashid *et al*., 2002).

During the 1990s ERP vendors added more modules and functions as "add-ons" to the core modules giving birth to the "extended ERPs." These ERP extensions include advanced planning and scheduling (APS), e-business solutions such as customer relationship management (CRM) and supply chain management (SCM) (Rashid *et al*., 2002).

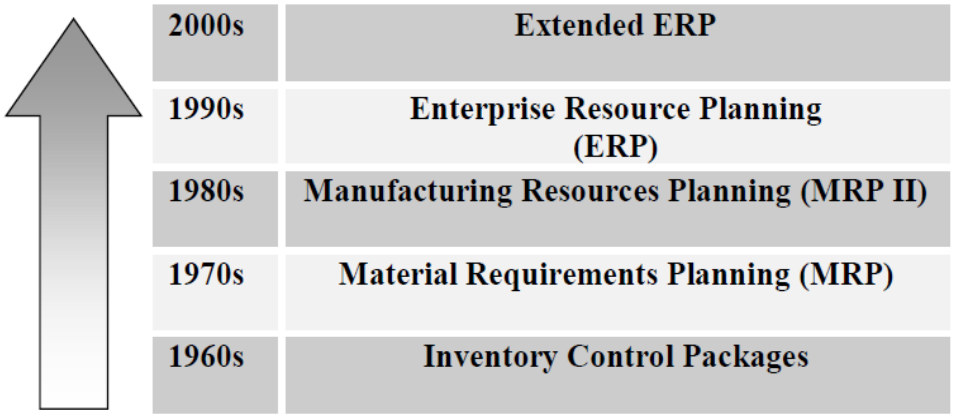


Figure 2.2 Evolution of ERP (Source: Rashid, Hossain, & Patrick, 2002)

2.3 ERP Implementation in Warehousing

Warehousing is a very important part of supply chain in every company whatever materials it is operating with. Effectiveness of warehousing can affect the overall business of the company and cause reorganization in the company (Titova, 2016). Nowadays warehousing processes are rapidly changing due to information systems development. New technologies such as ERP systems, barcodes, computerized equipment and many others have made warehousing efficient and precise in its operations. Also educational level of human resources has grown a lot, as personnel needs to be educated enough for computer-operated processes (Titova, 2016).

Nowadays, the latest generation of ERP systems is more advanced and more effective in dealing with multiple business units including sales and operations planning, inventory/materials management, manufacturing, purchasing, order processing, accounting and finance, human resources, customer relationship management, and more (Al-Sabaawi, 2015).

2.3.1ERP Implementation in ethio telecom Warehouses

Ethio telecom being the sole service provider of telecommunication has adopted this system just like any other organization with an objective to get excellence in its business from IT. The company adopted ERP in order to integrate its divisions, enhance overall efficiency of the company, streamline information, and increase responsiveness and to get other possible advantages that ERP can offer. The integrated divisions and departments are sales and marketing, finance, human resource, and procurement and facility warehousing and inventory. ERP can be considered as the central nervous system of logistics in which flow of materials is managed and controlled through ERP throughout the organization. And except for transport all main logistics components has implemented this system (warehousing, inventory, customer good shipment (customer service) and sourcing.

Warehouses of ethio telecom are places where the company store its valuable products that are vital for providing the services it renders and other materials that are significant for day to day activities of the company. The company has four corporate warehouses, six zonal warehouses and eight main regional warehouses. The corporate warehouses can be considered as the main distribution center where different materials are stocked and distributed to regional, zonal warehouses and to cite where the items are needed. The company has divided its items into four sub divisions which are network items; commercial items, support items and fixed assets. Knowing the importance of these items for its business intelligence the company has implemented ERP in warehouses so that the items can be tracked and managed effectively. In addition to this in contrast to previous way of dispatching materials manually to the place where they are needed ERP has enabled the

company to be responsive and satisfy end users through enhanced efficiency of warehouses resulted from the deployment of ERP system in warehouses.

ERP automates the flow of materials into, through and out of the corporate and zonal warehouses of ET. Processes automated by the ERP in ethio telecom warehouses include receiving, put away, order picking, shipping, and inventory control. Each company should carefully study its inventory and warehouse operations to be available to implement proper warehousing strategy.

The company deploys this integrated system with an objective to be "world class service provider". Back in the days where ERP was absent in the company much of the company work was affected and since there was no common template (like ERP) that integrates divisions that needs to be integrated in the company information flow and synergy was less compared to the new era of the company after deploying ERP.

2.4 Theoretical Foundation of ERP

2.4.1 Technology acceptance Model

The theoretical foundation primarily originates from a theory on the adoption and diffusion of innovation, where individuals' perceptions about using it are posited to influence adoption behaviors (Amoako-Gyampah & salam, 2003). Davis (1985) proposed that system is a response that can be explained or predicted by user motivation, which in turn is directly influenced by an external stimulus consisting of the actual system's features and capabilities. Davis further refined his conceptual model and suggested that user motivation can be explained by three factors; perceived ease of use, perceived usefulness, and attitude of a user toward a system was a major determinant of whether the user will actually use or reject the system. The attitude of the users, in turn was considered to be influenced by two major beliefs; perceived usefulness and perceived ease of use, with perceived ease of use having direct of influence on perceived usefulness (Chuttur, 2009).

2.4.2 DeLone & McLean IS success Model

The D&M IS Success Model, though published in 1992, was based on theoretical and empirical IS research conducted by a number of researchers in the 1970s and 1980s. In the D&M IS Success Model, "systems quality" measures technical success; "information quality" measures semantic success; and "use, user satisfaction, individual impacts," and "organizational impacts" measure effectiveness success (DeLone and McLean, 2003).

These six dimensions in the model proposed to be interrelated rather than independent. These dimensions are defined as follows (DeLone and McLean, 1992):

1- System Quality-the measure of the information processing system,
2- Information Quality-the measure of information system output,
3- Use-the recipient consumption in the output of an information system,
4- User Satisfaction-the recipient response to the use of the output of an information system,
5- Individual Impact-the measure of the effect of information on the behavior of recipient, and
6- Organizational impact-measure of the effect of information on organizational performance.

Until 2003, the association among the measures in D&M IS success model had been tested by different empirical studies. The result of these studies validated the causal structure of the D&M success model. Considering the reviews of their original model from the empirical studies, DeLone and McLean establish the updated D&M IS success Model as shown in the

In their updated model, DeLone and McLean added 'Service Quality' to the "Quality" dimension in the original model, and collapsed 'Individual Impact' and 'Organizational Impact' in to 'Net Benefit'. 'Service Quality' is include as an important dimension of IS success given the importance of IS support, especially in the e-commerce environment where customers service is crucial. The choice of where the impacts should be measured, from individuals to national economic accounts, will depend on the systems and their purpose. DeLone and McLean grouped all the "impact" measures into a single impact

category called “net benefit” rather than complicate the model with more success measures for the sake of parsimony.

2.4.3 The Critical Success Factors Model

Critical Success Factors (CSFs) approach was first used by Rockhart (1979). The CSFs frame work technique suggested by Rockhart (1982) declared that the use and scope of CSFs frame work depended on the subjective ability, style and perspective of the executives. He further explained that the shaping of CSFs could be seen from four viewpoints that were shaped by industries and the structural changes, by firm operational strategies, managers perception, and the change in environment (with regard to technology). The definition of success depends on the point of view of the person who defines it (Moohebat, Asemi1& Jazi, 2010). In information systems implementation research, there has been a lot of attention given to measuring “success” in implementation (Wong, 2003)

Critical success factors can be viewed as situated exemplars that help extend the boundaries of process improvement, and whose effect is much richer if viewed within the context of their importance in each stage of the implementation process (Somers & Nelson, 2001). While According to Bahti (2005) CSFs can be understood as the few key areas where things must go right for the implementation to be successful. Past studies have identified a variety of CSFs for ERP implementation, among which context related factors consistently appear. Measurement of ERP implementation in figures or statistically is difficult task but it should be measure with these factors that how much it is working and how these factors are implemented successfully (Alsudari, 213).

According to Holland, Light & Gibson (1999) the critical success factors can be divided between the planning (strategic) phase and the action (tactical) phase of the project. Strategic issues specify the need for a project mission, for top management support and a project schedule outlining individual action steps for project implementation. These issues are most important at the beginning of the project. Tactical issues gain in importance towards the end of the project and include communication with all affected parties,

recruitment of necessary personnel for the project team and obtaining the required technology and expertise for the technical action steps. Under strategic there are factors like Legacy systems, Business vision ERP strategy, Top management support, Project schedule/plans and under tactical there are Client consultation, Personnel Business process, change and software configuration, Client acceptance, Monitoring and feedback, Communication & Trouble shooting factors. While Umble *et al*., (2003) categorized the key success factors in ERP implementation under ten main points namely: clear understanding of strategic goals, commitment by top management, excellent implementation project management, great implementation team, successful coping with technical issues, organizational commitment to change, extensive education and training, data accuracy, focused performance measures, and multi-site issues resolved.

Top Management, Change Management, Project Management, Business process Re-Engineering, IT Infrastructure, Communication, and User training are the identified critical success factors in Alsudari, (2013) on Analysis and Exploration of Critical Success Factors of ERP Implementation. Somers & nelson (2001) proposed list of 22 CSFs associated with project/system implementations derived through a process that involved identification and synthesis of those critical requirements for implementation that have been recommended by practitioners and academicians through an extensive review of the literature. Based on the literatures reviewed the following are the identified critical success factors of ERP implementation.

2.4.3.1 Top Management Commitment and Support

The most frequently discussed CSF, identified by most of the researchers is that a successful ERP implementation requires top management support, because an implementation involves significant change to existing business processes as well as a significant amount of capital investment therefore gaining the required amount of support from top management becomes paramount therefore top management support is needed throughout the implementation (Wong, Scarbrough, Chau, & Davision, 2007). Top management support has been consistently identified as the most important and crucial success factor in ERP system implementation projects. Top management provides the

necessary resources and authority or power for project success. Top management support in ERP implementation has two main facets that is providing leadership and providing the necessary resources (Bahti, 2005). According to (Garg, 2010) the commitment of top management has been recognized as one of the most important elements in the successful implementation of ERP systems. Since the primary responsibility of top management is to provide sufficient financial support and adequate resources for building a successful system, the support of management will ensure that the project has a high priority within the organization and that it will receive the required resources and attention. The lack of financial support and adequate resources will inevitably lead to failure. Apart from this primary support, there should be steering committee, which can sponsor the money, ensure visibility and motivate the team.

To implement ERP system successfully, management should monitor the implementation progress and provide clear direction of the project. They must be willing to allow for a mindset change by accepting that a lot of learning has to be done at all levels, including themselves (Bhatti, 2005). Top management commitment and support leads to overall organizational commitment across an organization. It results in the successful ERP implementation (Umble *et al*., 2003)

2.4.3.2 Change Management

Managing change is a primary concern of many involved in ERP implementations. ERP systems introduce large-scale change that can cause resistance, confusion, redundancies, and errors (Somers & nelson 2001). According to Ash & Burn (2003) balancing conflicts between staff and technology and effectively managing employees in the change process are key elements for the successful ERP implementation.

2.4.3.3 Project Management

There is no question that effective project management must start with the definition of the requirements for the project leader position. His or her first task must then be to define the perimeter of the project, and to monitor it attentively as the project advances. Risk management plays an essential role, which may or may not be reflected in an in-depth

study, depending on the corporate culture (Franc¸oise, Bourgaul & Pellerin, 2009). A clear business vision is needed to guide the project throughout the ERP life cycle. Project management related factors like Clear goal and objective, Effective project management, Reasonable expectation, Other dept. participation, Change request, Implementation strategy, Data conversion, Clear & effective communication are very critical for a successful ERP implementation (Garg, 2010). There is no question that effective project management must start with the definition of the requirements for the project leader position. His or her first task must then be to define the perimeter of the project, and to monitor it attentively as the project advances. Risk management plays an essential role, which may or may not be reflected in an in-depth study, depending on the corporate culture While many in the IS business consider project management an oxymoron, its importance in IT projects is well–documented, and numerous methodologies and management tools exist (Somers & Nelson 2001). The high implementation risks of ERP projects imply the need for multiple management tools such as external and internal integration devices and formal planning and results-controls (Somers & nelson 2001). A clear business vision is needed to guide the project throughout the ERP life cycle. Project management related factors like Clear goal and objective, Effective project management, Reasonable expectation, Other dept. participation, Change request, Implementation strategy, Data conversion, Clear & effective communication are very critical for a successful ERP implementation(Garg,2010).

2.4.3.4 User Training

Training and education are important for the successful implementation of any new system. Adequate training of the employees in an organization is important in allowing the benefits and advantages of using the ERP to be fully realized. In order to successful implementation any ERP system; a retail industry must establish a good fully functional change management. Change management is required to prepare the existing business's human resources and infrastructure to match ERP system requirement (Garg, 2010).

At a minimum, everyone who uses ERP systems needs to be trained on how they work and how they relate to the business process early on in the implementation process (Somers &

Nelson 2001). End user training has been recognized a critical factor for ERP implementation (Bajwa , Garcia , & Mooney, 2004) due to the complexity of the integrated ERP system, end user training for a robust understanding of how the system works and how to use it. End user training has been recognized a critical factor for ERP implementation (Bajwa *et al*., 2004) due to the complexity of the integrated ERP system, end user training for a robust understanding of how the system works and how to use it Consequently, appropriate and user education and training will maximize ERP benefits and increase user satisfaction.

2.4.3.5 Effective Communication

Strong communication within the entire organization during the implementation process increases success for ERP implementation. It allows the organization's stakeholders to understand the goal and the expected benefits of the project as well as to share the progress of the project. An "open information policy" protects the various communication failures for the project (Seo, 2013).

2.4.3.6 Data Accuracy

A fundamental requirement for the effectiveness of ERP systems is the availability and timeliness of accurate data within the company, the challenge lies in finding the proper data to load into the system and converting all those disparate data structures into a single, consistent format (Somers & Nelson 2001). Conversion can be an overwhelming process, especially if companies do not understand what needs to be included in the new systems and what needs to be omitted (Somers & nelson 2001). Since ERP system modules are intricately linked to one other, inaccurate data input into one module will adversely affect the functioning of other modules. If you lie to the ERP systems, then the ERP systems will lie to you and you will get inaccurate or misleading results. Thus, data accuracy is a major determinant of ERP success (Nah & Delgado, 2001).

2.4.3.7 Clear Goals and Objectives

The key individuals in the organization must formulate motivating, realistic and clear vision of the ERP implementation, which will help achieving the best possible outcome in pleasing clients, empowering staff and easing suppliers (Umble *et al*., 2003). This vision should be set with specific and feasible goals and objectives which will designate the implementation's intended path. This should be communicated and infused to stakeholders during all project phases (Somers and Nelson, 2004).

2.4.3.8 Perceived Usefulness

Perceived usefulness which is defined as the degree to which a person believes that using a particular system would enhance his or her job performance (Davis, 1989). As demonstrated by Davis (1989) which indicate the perceived usefulness was a major determinant of people intention to use computers. Davis (1989) found that perceived usefulness affect behavioral intention-to use-ERP system through the attitude towards ERP system.

2.4.3.9 Consultant Support

Many organizations use consultants to facilitate the implementation process (Somers& Nelson, 2001). Due to the complexity of implementing an ERP system, it requires the use of either internal or external experts who are knowledgeable about the installation and software. Many companies prefer of must have external consultants to perform ERP implementation.

2.5 Empirical Review

Many companies around the world commence implementing ERP systems in 1990s; the main reason behind the implementation of ERP systems is to re-engineer business processes through a uniform information system (Rajagopal, 2002.) ERP implementation is now the back bone of the information system in most large and medium companies. Integration is one of the major objectives and benefit of ERP within the company between functions and departments but also outside the company between business partners

(Garbot, Mayere & Bazet, 2008). According to Al-sabaawi, (2015) significant improvements in efficiency, productivity and service quality, and to lead to a reduction in service costs as well as to more effective decision-making, improvement in information flow, rapid generation of financial information, promotion of e-commerce, and assistance in development of new organizational strategies are common benefits of successful ERP implementation. ERP systems provide firms with two new and different types of functionality: a transaction processing function, allowing for the integrated management of data throughout the entire company, and a workflow management function controlling the numerous process flows within the company (Al-sabaawi, 2015). According to Umble *et al.,* (2003) ERP provides two major benefits that do not exist in non-integrated departmental systems: (1) a unified enterprise view of the business that encompasses all functions and departments; and (2) an enterprise database where all business transactions are entered, recorded, processed, monitored, and reported.

As argued by Davenport (1998), ERP system provides seamless integration of all information flowing through a company's departments. With the seamless integration of information within institutions, managers are able to overcome frustrations emanating from incompatible system and inconsistent operating practices. Acquisition of these systems may be through commercial off the shelf systems or custom designed systems in line with telecom needs. Past studies in implementation of ERP systems in telecommunication institutions have focused more on the benefits that an institution can derive from adopting an ERP system.

According to Rizzi & Zamboni (1999) higher traceability levels gained through the implementation of an ERP informative systems module, (specifically Warehouse Management module of SAP R3), have allowed the creation of foundations to implement suitable optimization techniques in order to improve warehouse efficiency parameters, such as mean order shipping time, inventory accuracy, space utilization rates, shelf life issues. The case, for the problems presented, can be representative of all manual finished goods warehouses with piling storage systems of perishable goods, both from a theoretical point of view, and for practical implications. There are many success records of ERP systems

implementation in many companies such as Cisco systems, Eastman Kodak, Autodesk in which these companies were able to reap the possible benefit of ERP (Chen, 2001).

The introduction of ERP systems for modern enterprises has become one of the most effective tools to achieve high efficiency standards. It provides the firm with an operational backbone that, through a parallel process vision, grants integration between processes, and ultimately provides higher traceability standards (Rizzi &Zamboni, 1999).

In addition to having important strategic implications, enterprise systems also have a direct, and often paradoxical, impact on a company's organization and culture (Davenport 1998).

The implementation of an enterprise resource planning (ERP) can be considered one of the most effective ways towards traceability, since one of its major features is integration between modules, data storing/ retrieving processes and management and analysis functionalities, combined with the typical functionalities of standalone applications (Rizzi & Zamboni, 1999).

2.6 Success Indicators of ERP System

One of the most enduring research topics in the field of information system is that of system success (DeLone and McLean, 1992). In ERP system, success takes on special urgency since the cost and risk of these valuable technology investment rivals the potential pay offs. Optimal success refers to the best out comes the organization could possibly achieve with enterprise systems, concerning with its business situation, measured against a portfolio of project, clearly operational and long term business metrics (Markus, Petrie and Tranis, 2000). According to DElone & Mclean (2003) the measurement of information system (IS) success or effectiveness is critical to the understanding of the value and efficacy of IS management actions and IS investments.

2.6.1User Satisfaction

When the use of an information system is required, the preceding measures become less useful; and successful interaction by management with the information system can be measured in terms of user satisfaction. Information satisfactoriness is defined as the degree

of match between task characteristics and I/S functionality. User satisfaction or user information satisfaction is probably the most widely used single measure of I/S success (DElone& Mclean 1992).

2.6.2 Individual impact

The Effect of information on the Behavior of the Recipient Of all the measures of I/S success, “impact" is probably the most difficult to define in a non-ambiguous fashion. It is closely related to performance, and so "improving my or my department's performance" is certainly evidence that the information system has had a positive impact. Organizational Impact: The Effect of Information on Organizational Performance (DElone & Mclean, 1992)

2.6.3 Organizational Impact

DeLone and McLean (1992) found that field studies which dealt with the impact of information system chose a variety of organizational performance measures. The possible measures of organizational impact include: cost reduction, revenue increase, and profit increase.

2.6.4 Result Demonstrability

One dimension concentrated on the tangibility of the results of using the innovation, including their Observability and Communicability, and was labeled Result Demonstrability (Moore & Benbasat).

2.6.5 Compatibility

As defined by Moore & Benbasat it is the degree to which an innovation is perceived as being consistent with the existing values, needs, and past experiences of potential adopters.

2.6.6 Job Relevance

One key component of the matching process is a potential user’s judgment of job relevance, which we define as an individual’s perception regarding the degree to which the target system is applicable to his or her job (Venkatesh and Davis, 2000).

2.6.7 Output Quality

According to Venkatesh and Davis, 2000 output quality is how well the system performs tasks matching their job goals.

2.6.8 System Reliability

System reliability can be defined as the degree to which the system ensures the delivery of the data to the users. It is an important component of technical quality of IT system, and partly affects how well system performs its expected function (kim, 1988). One of the most important advantages of ERP system is to provide real time and accurate information. This advantage can be corrupted if a system is not reliable.

2.6.9 Reporting Capability

Major benefit of ERP system for companies are management reporting and measurement reporting such as critical success factor (CSF) and key performance indicator(KPI) (kim, 1988).

2.7 Conceptual frame work

Based on the literature reviewed the conceptual frame work of this study is;

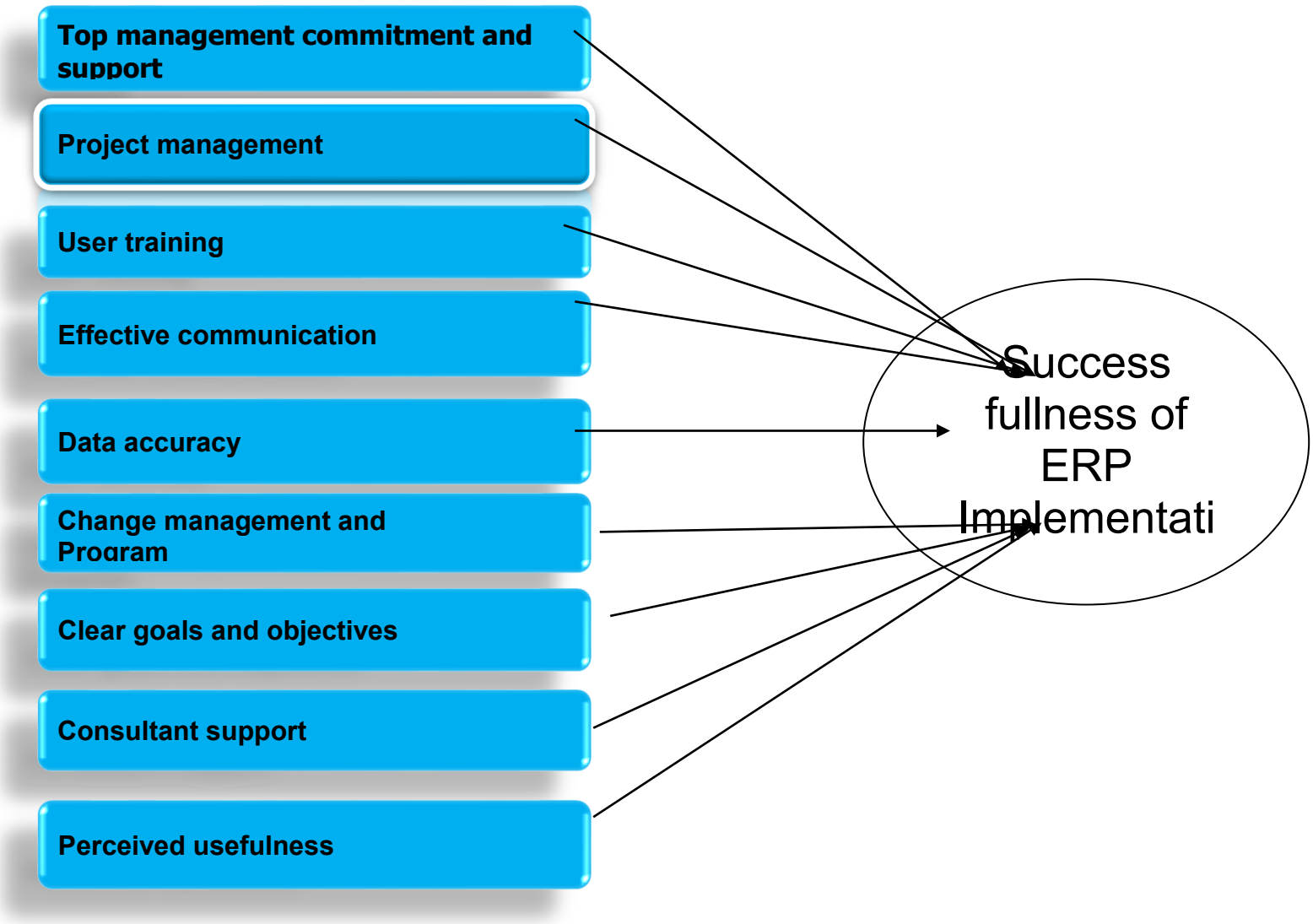


Figure 2.5; conceptual frame work constructed based on literature adopted

Source; (from literature adopted)

Table 2.1 literature of critical success factors

No	Critical Success Factors	Literature
1	Top Management Commitment and Support	Wong, Scarbrough, Chau, & Davision, 2007), (Bahti, 2005), (Garg, 2010) &**(**Umble, Haft, & Umble, 2003**)**
2	Change Management	(Somers & nelson, 2001) & Ash & Burn (2003)
3	Project Management	(Franc¸oise, Bourgaul & Pellerin, 2009, Garg, 2010), (Somers & Nelson 2001)
4	User Training	(Garg, 2010). Somers & Nelson 2001). (Bajwa , Garcia , & Mooney, 2004)
5	Effective Communication	(Seo, 2013)
6	Data Accuracy	(Somers & Nelson 2001), (Nah & Delgado, 2001).
7	Clear Goals and Objectives	(Umble, Haft, & Umble, 2003), (Somers and Nelson, 2004)
8	Perceived usefulness	(Davis, 1989)
9	Consultant support	(Somers& Nelson, 2001).

CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY

3.1 Research Design

The research design used in this thesis was both descriptive research design & explanatory research design. Through this method critical success factors and success indicators of ERP implementation in ethio telecom warehouses was described and assessed from the data gathered.

In order to achieve the desired general and specific objective of this study both qualitative and quantitative method were applied to analyze the gathered information. Qualitative research is an approach for exploring and understanding the meaning individuals or groups ascribe to a social or human problem (Creswell, 2014). Quantitative research is an approach for testing objective theories by examining the relationship among variables. These variables, in turn, can be measured, typically on instruments, so that numbered data can be analyzed using statistical procedures (Creswell, 2014). Qualitative method was applied in order to know attitudes and perception of respondents in implementation of ERP Particularly in ethio telecom warehouses. Quantitative method was applied in order to describe the gathered data from structured questioner in mathematical manner and be able to answer the research question.

3.2 Sample Design and Size

The target populations of this study were those who are working in Addis Abeba under warehousing section in ethio telecom. The respondents of this thesis participated in data collection were those who use ERP system and have ERP account since they were capable of giving the data needed for this thesis. The target populations of this study are working in corporate and zonal offices. Since the zonal warehouses and the regional warehouses ERP system adaptation and the activities done in zonal warehouses is the same as the regional warehouses the zonal warehouse respondents feedback can resemble the

regional warehouses. Therefore the result derived from this study can be also applied in regional warehouses of the company.

Due to the fact That the target population in this study are dispersed and are located in different geographical area stratified sampling technique was used. And for the purpose of this research systematic sampling technique was used and from each stratum those who use ERP system participated in the survey.

Table 3.1 sample size

	Population	Total population	Sample size unit
1	**central warehouse**	**38**	**35**
2	**Akaki warehouse**	**12**	**9**
4	**Garage warehouse**	**7**	**7**
5	**pole warehouse**	**4**	**4**
6	**North addis abeba warehouse**	**5**	**5**
7	**South addis abeba warehouse**	**4**	**4**
8	**East addis abeba warehose**	**3**	**3**
9	**West addis abeba warehouse**	**5**	**5**
10	**South west addis abeba warehouse**	**5**	**5**
11	**Central addis abeba warehousre**	**6**	**6**
	Total	**89**	**83**

3.4 Data Collection

In order to achieve the general and specific objectives of the study both primary data and secondary data were used. Primary data was gathered from the target population using structured questionnaires as an instrument. The questionnaire was developed after an extensive review of different literatures that are made on the same topic. The questionnaire of this paper was mainly adapted from the research previously made on critical success

factors of ERP implementation in ethio telecom. And secondary data was gathered from the issue logged on the ERP failure.

3.5 Data Analysis

Once the needed information was gathered the next step was analyzing it. And the collected data was analyzed by employing computer software known as SPSS version 20. In order to answer the research questions both descriptive and inferential statics were used. Descriptive statistical methods such as frequency, percentage, standard deviation, mean, tables were used in order to describe the gathered data. And in order to find out the relationship between critical successes factors and successfulness of ERP implementation multiple regression analysis was used.

3.6 Ethical Consideration.

Ethical practices that were considered during this study was Confidentiality of responses, secrecy of respondents, honesty in reporting findings of the study and integrity in handling data and information collected from the research study. Disclosing of information by employees to a third party can and will expose the institution to potential legal conflict, due to this ethical issue the respondents might be fearful to disclosure such information. However, this fear was addressed by explaining the objective of the study and providing assurance that the data will be handled professionally and is only going to be used for the thesis. With regard to reference all the materials and sources that were used are properly acknowledged.

CHAPTER FOUR: DATA ANALYSIS

4.1Introduction

The data analysis and interpretation of the results are briefly discussed under this chapter as follows. The data was collected using likert scale questionnaire. And out of the 83 questionnaires distributed to all target population 76 questionnaires were returned and analyzed. In which the response rate of this questionnaire is about 91.5%. And this shows that the data is quite significant to give reliable findings for the study.

Table 4.1 Response Rate

	Frequency	**Percentage**
Non Respondent	7	8.5
Actual Respondent	76	91.5
Target population	**83**	**100%**

4.2 Demographic Information of Respondents

Information's like gender, age, level of education and years of service in current position were the first part of the questionnaire which were the means of acquiring the general information of respondents participated in this questionnaire.

4.2.1 Gender of Employees

According to the findings male respondents were higher than female respondents in which 62% of respondents were male while 38% of respondents were female.

Table 4.2 gender of employees

Gender		Frequency	Percent
Valid	Male	47	61.8
	Female	29	38.2
	Total	76	100

Source :(survey, 2017)

4.2.2 Age of Respondents

As it is indicated in the following table 54% of the respondents of the questionnaire were 31-40, 25 % of the respondents are under the age between 41-50 and 21% of the respondents are between the ages 41-50.

Table 4.3 Age of respondents

		Frequency	Percent
Valid	25-30	16	21.1
	31-40	41	53.9
	41-50	19	25
	Total	76	100

Source: (survey, 2017)

4.2.3 Level of Education

The findings show that almost all respondents are in the same level in which 99 % of the respondents have first degree while only one person from the respondents have master's degree which is 1%. From this we can say that all the respondents of this questionnaire are well educated.

Table 4.4 level of education

	Frequency	Percent
BA Degree	75	98.7
Master degree	1	1.3
Total	76	100

Source :(survey, 2017)

4.2.4 Experience

Majority of the respondents of this questionnaire have stayed in the company from 6-10 years which comprises 34%, 25% of the respondents have worked from 11 to 15 years, 20% of the respondents have 1-5 years of experience 18% of the respondents have stayed in the company from 16-20 years and only 2.6% of the respondents have 21-25 years of experience.

Table 4.5 experience of respondents

Experience	Frequency	percent
1-5 years	15	19.7
6-10 years	26	34.2
11-15 years	19	25
16-20 years	14	18.4
21-25 years	2	2.6
Total	76	100

Source :(survey, 2017)

Reliability and Validity Issues

Reliability

To make the study more acceptable and recognized both reliability and validity has been confirmed. In order to see the consistency or reliability of the data gathered Cronbach's alpha coefficient was used to see how consistently respondents have responded to the questionnaire. Cronbach's coefficient alpha is used to assess reliability on multi item scale. And Cronbach's coefficient alpha for all items was above 0.7 for all critical success factors which indicates that there is high internal consistency within the data.

Validity of the Findings of This Research

In order to keep this thesis valid different literatures were deeply reviewed to understand ERP implementation trend and its success factors that are made so far. Even if there are few studies in our country with this subject matter it was quite enough to get an understanding on ERP implementation in the company as most of the studies made on ERP includes ethio telecom. The questionnaires constructed were evaluated and approved to be consistent with the objective of the study by our advisor. In addition to this as the questionnaires were directly adopted from different previous research's made on the title which is quite similar with this study it made the data collecting instrument of this study reliable since the questionnaires validity was repeatedly checked. Most of the respondents of the questionnaire have deep understanding on ERP as their day to day activity is

connected with ERP and are well educated the questionnaire was easy and understandable for them. The final report of this study was made based on the respondent's response.

4.3 Detail Analysis of Critical Success Factors of ERP Implementation

In this section by using descriptive statistics on SPSS critical success factors were described and assessed.

Top management commitment and support

Table 4.6 briefly describes top management commitment and support statistics. The questions under this factor were answered by all 76 respondents. The mean of this variable ranges from 3.87 to 4.22 this indicates that most of the respondents have agreed to the stated statements under this category of the questionnaire. And this implies that the respondents accepted these items as key success factors.

As it is indicated in the table the standard deviation of Top management provides sufficient incentives & Top management support to technological innovations is almost that same. Standard deviation shows the deviation of each value in the distribution from the mean. So these two questions have the same dispersion. While the largest standard deviation holder among the four items is top management support positively and enthusiastically this indicates that there is largest dispersion within these items among the four items.

Table 4.6 Descriptive Statistics-Top management commitment and support

	N	Minimum	Maximum	Mean	Std. Deviation
Top management support to technological innovations	76	1	5	4.12	.610
Top management provide committed leader ship	76	1	5	3.96	.552
Top management support positively and enthusiastically	76	1	5	4.22	.624
Top management provides sufficient incentives	76	1	5	3.87	.550
Valid N (listwise)	76				

Source :(survey, 2017)

Table 4.7 Reliability Statistics of Top management commitment and support

Reliability Statistics		
Cronbach's Alpha	N of Items	
.875	4	

Source :(survey, 2017)

The above table stands for reliability statistics of top management commitment and support the Cronbach's Alpha coefficient for the four items is 0.875 which is greater than 0.7 and this indicates that the items from the scale have internal consistency. Or the data under this item is consistent and reliable.

Project Management

The below table represents the descriptive statistics of project management the mean of the three items ranges from 3.76 to 3.8 this implies that most of the respondents tend to agree with the question items**.**

Table 4.8 Descriptive Statistics-Project management

	N	Minimum	Maximum	Mean	Std. Deviation
ERP team commitment to advocate and manage the project	76	1	5	3.76	.651
Sufficient communication channels	76	1	5	3.79	.573
Sufficient evaluation measure to ERP operations	76	1	5	3.80	.611
Valid N (listwise)	76				

Source :(survey, 2017)

The standard deviation of ERP team commitment to advocate and manage the project is the highest of the three items in which the greatest dispersion is found under this item. As the mean of the three items approach to 4 project management is the key success factor of ERP implementation in ethio telecom warehouses.

Table 4.9 Reliability statistics of project management

Reliability Statistics		
Cronbach's Alpha	N of Items	
.962	3	

Source :(survey, 2017)

The above table indicates that the coefficient of Cronbach's Alpha of the three question items of project management is 0.962 which is far from 0.7 and this implies that the scale items under project management are consistently reliable.

User Training

Table 4.10 stands for the descriptive statistics of user training showing that most of the respondents tend to agree with the four items. The mean of all the four items of user training ranges from 3.72 to 3.97 which approaches to 4 and this implies that user training is accepted as the key success factor of ERP implementation by the respondents. Among the four items Continuous training on new technologies among staff has the largest standard deviation and with the greatest dispersion of all the remaining three items.

Table 4.10 Descriptive Statistics-user training

	N	Minimum	Maximum	Mean	Std. Deviation
Adequate training materials on ERP modules	76	1	5	3.97	.588
Continuous training on new technologies among staff	76	1	5	3.72	.759
Opportunities to perform test before implementation of ERP	76	1	5	3.75	.676
user participation in early stage of system development	76	1	5	3.74	.681
Valid N (listwise)	76				

Source :(survey, 2017)

Table 4.11 Reliability Statistics of user training

Cronbach's Alpha	N of Items	
.809	4	

Source :(survey, 2017)

The above table shows the Cronbach's Alpha coefficient for the four items under user training which is 0.809 and this shows that there is consistency among these four items and the data is reliable.

Effective Communication

The below table shows the descriptive statistics of effective communication the mean of this item ranges from 3.75 up to 4.12 which indicate that most of the respondents tend to agree to the four items. And this implies that effective communication is the key success factor of ERP success in ethio telecom warehouses. The largest standard deviation holder among the four items is ERP team understands the goal/objectives of ERP and this implies that there is largest dispersion under this item.

Table 4.12 Descriptive Statistics-Effective Communication

	N	Minimum	Maximum	Mean	Std. Deviation
ERP team was well prepared to communicate with users	76	1	5	4.12	.765
ERP team understands the goal/objectives of ERP	76	1	5	3.75	.768
Senior encouraged and award staff for their ideas	76	1	5	3.86	.687
Arrival of system is always communicated to employees	76	1	5	3.92	.707
Valid N (listwise)	76				

Source :(survey, 2017)

Table 4.13 Reliability Statistics of effective communication

Reliability Statistics		
Cronbach's Alpha	N of Items	
.929	4	

Source :(survey, 2017)

Table 4.13 shows the Cronbach's Alpha coefficient for effective communication which is 0.929 and greater than 0.7 implies that there is internal consistency among the four items and the data is reliable.

Data Accuracy

Data accuracy with two items has the mean of 3.7 that shows most of the respondents tend to agree with the statements and consider data accuracy as the key success factor for ERP implementation in ethio telecom warehouses. All data required by users was loaded has greater dispersion than Data transfer was accurate to ERP with standard deviation 0.849.

Table 4.14 Descriptive Statistics-Data Accuracy

	N	Minimum	Maximum	Mean	Std. Deviation
Data transfer was accurate to ERP	76	1	5	3.71	.649
All data required by users was loaded	76	1	5	3.70	.849
Valid N (listwise)	76				

Source :(Field data, 2017)

Table 4.15 shows Cronbach's Alpha coefficient of the above two items which is 0.813 and greater than that of 0.7 implies that there is internal consistency among the two variables and the data is reliable.

Table 4.15 Reliability Statistics of Data Accuracy

Reliability Statistics	
Cronbach's Alpha	N of Items
.813	2

Source :(survey, 2017)

Change Management

The below table indicates the descriptive statistics of change management. The mean of this item ranges from 3.79 to 3.96 implying that most of the respondents agree to the question items. And this indicates that change management is the key success factor of

ERP implementation in ethio telecom warehouses. Adequate resource for change has the highest standard deviation among the four items and this shows that there is greatest dispersion in this item among the four items.

Table 4.16 Descriptive Statistics-Change management

	N	Minimum	Maximum	Mean	Std. Deviation
Management approach to change was successful	76	1	5	3.96	.682
Adequate resource for change	76	1	5	3.68	.836
Recognizing employees for contribution to change initiatives	76	1	5	3.79	.736
Management asked employees what should change	76	1	5	3.79	.660
Valid N (listwise)	76				

Source :(survey, 2017)

As indicated in the below table Cronbach's Alpha coefficient is greater than 0.7 implying that there is internal consistency among the above four items of change management. And the data is reliable.

Table 4.17 Reliability Statistics of change management

Reliability Statistics	
Cronbach's Alpha	N of Items
.839	4

Source :(survey, 2017)

Clear Goals and Objectives

Table 4.17 shows the descriptive statistics of clear goals and objectives. The mean of this item ranges from 3.79 to 3.83 and this shows that most of the respondents tend to agree to

the question items or the four items. Adoption of ERP is in line with organization's mission and vision with the greatest standard deviation has the largest dispersion among the four items.

Table 4.18 Descriptive Statistics-Clear Goals and Objectives

	N	Minimum	Maximum	Mean	Std. Deviation
Adoption of ERP is in line with organization's mission and vision	76	1	5	3.83	.737
ERP implementation is part of the organizational strategy	76	1	5	3.80	.731
Work culture importance for ERP implementation	76	1	5	3.75	.656
ERP system customization with organizational needs	76	1	5	3.79	.736
Valid N (listwise)	76				

Source :(survey, 2017)

As it is indicated in the below table Cronbach's Alpha coffcient for the above four items is greater than 0.7 and this implies that there is internal consistency among the four variables and the data is reliable.

Table 4.19 Reliability Statistics of Clear Goals & Objectives

Reliability Statistics	
Cronbach's Alpha	N of Items
.957	4

Source :(survey, 2017)

Perceived Usefulness

According to the below table of descriptive statistics of perceived usefulness the mean for all items is 4 and above. This indicates that most of the respondents agree to the question items or statements of perceived usefulness implying that perceived usefulness has a great impact and is the key success factor on ERP success fullness of ERP in ethio telecom warehouses. The standard deviation of the four items ranges from 0.639 to 0.816 and ERP is useful in my job has the greatest dispersion among the four items with the highest standard deviation which is 0.816.

Table 4.20 Descriptive Statistics- Perceived Usefulness

	N	Minimum	Maximum	Mean	Std. Deviation
ERP improves performance	76	1	5	4.09	0.769
ERP improves productivity	76	1	5	4.07	0.639
ERP improves effectiveness	76	1	5	4.03	0.711
ERP is useful in my job	76	1	5	4	0.816
Valid N (listwise)	76				

Source :(survey, 2017)

Table 4.21 indicates Cronbach's Alpha coefficient is greater than 0.7 and this indicates that there is internal consistency among the above four variables and the data is reliable.

Table 4.21 Reliability Statistics of clear goals and objectives

Reliability Statistics	
Cronbach's Alpha	N of Items
.856	4

Source :(survey, 2017)

Consultant Support

The below table represents the descriptive statistics of consultant support and as it is indicated in the table the mean of the two items is 3.8 which implies most of the

respondents tend to agree to the two items and consider consultant support as the key success factor of ERP implementation on ethio telecom warehouses. Consultant helps to success of ERP with the greater standard deviation has greater dispersion than Consultant helps in a right direction.

Table 4.22 Descriptive Statistics- Consultant Support

	N	Min	Max	Mean	Std. Deviation
Consultant helps in a right direction	N	Minimum	Maximum	Mean	Std. Deviation
Consultant helps to success of ERP	76	1	5	3.86	.934
Valid N (listwise)	76	1	5	3.82	.962

Source :(survey, 2017)

As it is indicated in the below table the Cronbach's Alpha coefficient is greater than 0.7 implying that there is internal consistency within the two variables and the data is reliable.

Table 4.23 Reliability Statistics of consultant support

Reliability Statistics	
Cronbach's Alpha	N of Items
.790	2

Source :(survey, 2017)

Of all the 9 critical success factors in this paper perceived usefulness was the highest mean scorer than the other variables next to this factor top management and effective communication were the next and third factors. Alemu, Mesfin & Mesfin in their study on ERP Implementation Framework: The Case of Ethiopia has also found that perceived usefulness to be the first ranked with highest mean value among the other critical success factors.

According to Colmenares (2009) top management was found to be the first ranked critical success factor with the highest mean value. Whereas top management was found to be the

bottom ranked with the lowest mean in AL-sabawi (2015) instead project management and effective communication were on the top three ranked list with high mean value.

Table 4.24 Rank of critical success factors

Critical success factors	Mean	Rank	standard deviation
perceived usefulness	4.0461	1	0.61605
Top management commitment and support	4.0395	2	0.500009
Effective communication	3.9079	3	0.66813
Consultant support	3.8355	4	0.86174
Change management	3.8059	5	0.60083
User training	3.7961	6	0.54116
clear goals and objectives	3.7928	7	0.67378
project management	3.7807	8	0.58766
Data accuracy	3.7039	9	0.69367

Source :(survey, 2017)

According to the above table all the mean value of the factors is above 3.5 and this indicates that all the 9 factors are the key success factors for ERP implementation in ethio telecom warehouses.

Normality, Linearity and Homoscedastic

The following two diagrams prove that the linear regression of this study met the assumption under linear regression that are linearity, normality and same variance. The first assumption is that normality and Figure 4.1 histogram of the standardized residuals which examines whether they are normally distributed or not and it shows the residuals are normally distributed

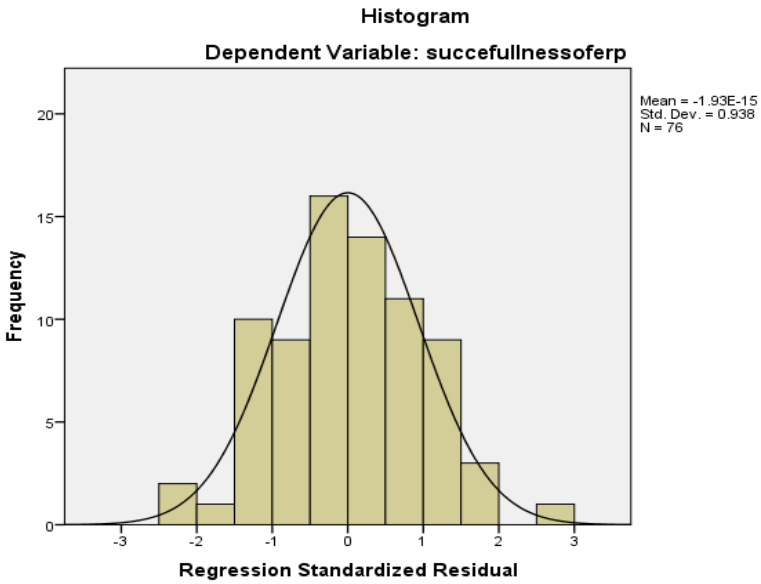


Figure 4.1 histogram- dependent variable: Successfulness of ERP

Source ;(survey, 2017)

As it is indicated in the below diagram linearity and same variance (homoscedasticity) are met since the scatters do not make any curve and the scatters go along with the line.

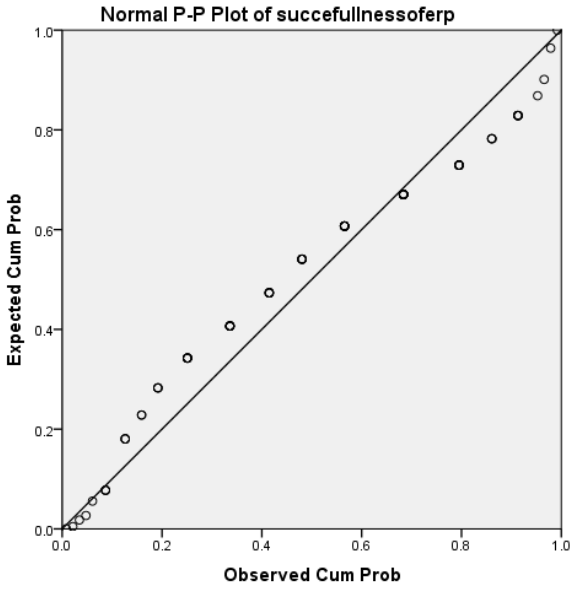


Fig 4.2 normal P-P plot of regression standardized residual.

Source ;(survey, 2017)

Absence of Multi Collinearity

This assumption emphasizes that independent variables shouldn't be highly correlated or perfectly correlated. Multiticollinearity is when they are highly correlated whereas singularity is when the independent variables are perfectly correlated. In order to check whether there is high relationship between independent variables Variance inflation factor was used to detect multi collinearity. And based on the rule of thumb, a maximum VIF of ten or more is considered an indication of the presence of interdependence multi collinearity was found to be absent within the independent variables of this study in which as it is indicated in table 4.23 the value of VIF ranges from 1.81 to 1.692 which is less than 10 and this indicates that there is no multi collinearity.

4.3 Regression Analysis of Critical Success Factors

Regression analysis assess whether there is a relationship between the dependent variable and the independent variable or not. And in order to achieve the desired objective of this study multiple regression analysis was assessed between the dependent variable successfulness of ERP and the independent variables (perceived usefulness, change management, user training, top management commitment and support, clear goals and objectives, effective communication, project management, data accuracy and consultant support) the dependent variable (success fullness of ERP) was measured by user satisfaction.

$$Y= \beta_0+ \beta_1X_1+\beta_2X_2+ \beta_3X_3+ \beta_4X_4+\beta_5X_5+\beta_6X_6+ \beta_7X_7+ \beta_8X_8 + \beta_9X_9+\alpha$$

Where Y is the dependent variable (successfulness of ERP), β_0 is the regression coefficient, β_1, β_2, β_3, β_4, β_5, β_6, β_7, β_8 , β_9 are the slopes of the regression equation the independent variables are;

X_1 = Top Management Commitment and Support

X_2= Project Management

X_3 =User Training

X_4= Effective Communication

X_5= Data accuracy

X_6 = Change Management

X_7= Clear Goals and Objectives

X_8= Perceived Usefulness

X_9 =consultant support

Whereas α = error term

4.3.1 Result Discussion

By using SPSS version 20 the following results were determined from regression analysis. And as it is indicated on the below table correlation is 0.681 which shows existence of linear relationship between the dependent and the independent variables. The coefficient of determination or adjusted R square value is 0.621 which indicates that 62 % of successfulness of ERP is explained by the chosen critical success factors or all the chosen independent variables were critical for successfulness of ERP at the rate of 62%.

Table 4.25 Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.681[a]	0.691	0.621	0.102

a. Predictors: (Constant), Consultant support , Data curacy , Project management , Top management commitment and support , Clear goals and objectives , Perceived usefulness , Change management , Effective communication , User training.

b. Dependent Variable: success fullness of ERP

Model Summary

Source ;(survey, 2017)

The below table shows that the regression analysis was significant at p value 0.000 which is less than 0.05 and the probability that success fullness of ERP is explained randomly is extremely low.

Table 4.26 ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.053	9	0.128	9.07	.000[b]
	Residual	1.129	66	0.022		
	Total	2.182	75			

Source ;(survey, 2017)

a. Dependent Variable: success fullness of ERP

b. Predictors: (Constant), Consultant support , Data curacy , Project management ,Top management commitment and support , Clear goals and objectives , Perceived usefulness , Change management , Effective communication , User training.

Table 4.27 Regression Coefficients

Coefficients[a]										
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	1.136	0.306		5.9	0	1.524	2.748		
	Top management commitment and support	0.268	0.043	0.39	2.9	0.003	0.052	0.263	0.618	1.617
	Project management	0.126	0.02	0.25	2.267	0.041	0.066	0.06	0.86	1.162
	User training	0.245	0.09	0.36	2.68	0.0037	0.034	0.233	0.591	1.692
	Effective communication	0.195	0.04	0.237	2.64	0.004	0.066	0.161	0.045	1.549
	Data accuracy	0.138	0.035	0.08	2.229	0.009	0.04	0.092	0.0841	1.19
	Change management	0.12	0.04	0.03	2.113	0.84	0.09	0.098	0.069	1.642
	Clear goals and objectives	0.125	0.03	0.04	2.117	0.0065	0.053	0.008	0.856	1.169
	Perceived usefulness	0.154	0.027	0.13	2.584	0.005	0.03	0.016	0.846	1.182
	Consultant support	0.124	0.016	0.05	2.115	0.0068	0.039	0.025	0.847	1.181

Source ;(survey, 2017)

According to the above table the B value for all the critical success factors is positive implying that all the independent variables are positively associated with the dependent variable. In which a unit increase in top management will result in 0.268increases in successfulness of ERP. A unit increase in user training leads in 0.245increase in successfulness of ERP. A unit increase effective communication will result in 0.195increases in successfulness of ERP. A unit increase in perceived usefulness will result in 0.154increases in successfulness of ERP in ethio telecom warehouses. A unit increase in data accuracy will result in 0.138increase in successfulness of ERP in ethio telecom warehouses. A unit increase in project management will result in 0.126 increases in successfulness of ERP implementation in ethio telecom warehouses a unit increase in clear

goals and objectives will result in 0.125 increases in successfulness of ERP. A unit increase in consultant support will result in 0.124increases in success fullness of ERP implementation warehouses. A unit increase in change management will result in 0.12increases in successfulness of ERP implementation in ethio telecom warehouses. This indicates that all the independent variables are positively related to the successfulness of ERP implementation in ethio telecom warehouses. At 95% confidence interval except for change management all the 8 factors were found to be the significant predictors of the dependent variable.

Table 4.28 Rank of critical success factors

Critical Success Factors	B	sig	Rank
Top management commitment and support	0.268	0.003	1
User training	0.245	0.0037	2
Effective communication	0.195	0.004	3
Perceived usefulness	0.154	0.005	4
Data accuracy	0.138	0.009	5
Project management	0.126	0.041	6
Clear goals and objectives	0.125	0.0065	7
Consultant support	0.124	0.0068	8
Change management	0.12	0.84	9

Source (survey; 2017)

The above table shows that to top management commitment and support has greatest impact on successfulness of ERP implementation in ethio telecom warehouses. And as it is shown in the third column all the critical success factors except for change management with 95% confidence interval are found to be the significant predictors of successfulness of ERP implementation in ethio telecom warehouses.

4.4 Analysis of Success Indicators of ERP

Based on an intensive literature review 10 success indicators were constructed to analyze success of ERP system. And to assess the success indicators of ERP implementation in

ethio telecom warehouses respondents were asked for their feedback on success indicators of ERP implementation in ethio telecom warehouses.

Table 4.29 Descriptive Statistics of success indicators

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
User Satisfaction	76	2.33	5.00	4.05	.45883
Individual Impact	76	3.00	5.00	4.05	.44904
Organizational Impact	76	2.75	4.75	4.15	.39574
Project Success	76	2.67	5.00	4	.44562
Output Quality	76	2.50	5.00	3.9	.63190
Job relevance	76	3.00	5.00	4.2	.37387
Result Demonstrability	76	3.00	5.00	4.19	.37387
Compatibility	76	1.50	5.00	3.96	.56766
System Reliability	76	1.00	5.00	4.09	.59279
Reporting Capability	76	2.98	4.98	4.12	.32640
Valid N (listwise)	76				

Source: (survey, 2017)

User Satisfaction

As it is indicated in the above table the mean of user satisfaction is 4 and this indicates that the respondents agreed to ERP system quality, performance of ERP and overall ERP system.

Individual Impact

According to table 4.29 the mean of individual impact is 4 showing that the respondents agreed to individual impact as the success indicator of ERP system in ethio telecom warehouses.

Organizational Impact

Based on table 4.29 organizational impact has the mean score of 4.1 indicating that ERP has an impact on the organization using ERP helps the company in reducing operating costs of the organization, increasing revenue. Due to an increase in organizational impact

of ERP system in ethio telecom warehouses the productivity and effectiveness of the company has greatly increased due to reduction of the time it takes to accomplish each job. As a result of this operation costs of the organization is minimized.

Output Quality

Based on the above table result the mean value of output quality is 3.97 which indicates that respondents have agreed with the output quality generated for the system. Users of this system in ethio telecom warehouses are able to generate report from ERP system that will help them in making effective decision.

Job relevance

The mean value of this success indicator is 4.1908 indicating that the respondents have agreed to the fact that ERP is important for their work and the system is job related.

Result Demonstrability

According to table 4.29 the mean value of result demonstrability is 4.19 showing that respondents have agreed to the question items of result demonstrability this implies that the respondents have no difficulty of telling to others about using ERP system and they are capable of communicating with others about consequences of using ERP in a simple manner.

Compatibility

The mean value of compatibility is 3.967 and this shows that the respondents have agreed that they are capable of exporting the system result to another system or software and do not face difficulty in importing data from other systems.

System Reliability

As it is indicated in the above table the mean value of system reliability is 4 which show that the respondents have agreed to the system reliability.

Reporting Capability

The mean value of reporting capability is 4.1 implying that the respondents have agreed to the question items and the report generated from ERP system is useful for decision makings. And the respondents have no difficulty in getting any report from ERP systems.

The above findings indicates that the mean score value for all the questions responded by the 76 respondents is 4. This implies that they have agreed with the ERP system success indicators measurements in the case of ERP implementation in ethio telecom warehouses.

4.4 Secondary Data Analysis

The below data is taken from ERP support team from issues logged which can't be solved by their capacity and are logged to transform the issues to the vendor. Most of the challenges occurred with regard to ERP functionality is solved by this team and are not logged in which once they solve the issue it will not be kept as a data. Only those issues that can't be solved by the support team are logged to transform it to the vendor. As it is indicated in table there were 8 issues that occur under warehouse domain which couldn't be solved by the support team that were logged to be solved by the vendor. And 62.5% percent of the issues were solved by the vendor and are closed whereas 37.5% of the issues were not solved or closed yet.

Table 4.30 Secondary data

TT number	Issue	TT creation date	TT closed date	TT closed date
ERP_SCM_2016_0086	unable to do inspection because the location is empty	9/15/2016		
ERP_SCM_2016_0100	unable to do receiving on IPROC	11/7/2016	11/7/2016	11/7/2016
ERP_SCM_2016_0103	unable to close inventory period	12/2/2016	12/2/2016	12/2/2016
ERP_SCM_2017_0118	Packing slip complete with error.	1/4/2017	1/6/2017	1/6/2017
ERP_SCM_2017_0119	unable to receive	1/5/2017		
ERP_SCM_2016_0115	unable to interface shipped status 10245734			
ERP_SCM_2017_0159	TEP PO Receiving control	4/7/2017		
ERP_SCM_2017_00160	unable to increase on hand balance	4/7/2017		

Source: (from ethio telecom report on issues logged on ERP failure)

CHAPTER FIVE: CONCLUSION AND RECOMENDATION

5.1 Summary of Major Findings

The finding of the data analysis made on SPSS shows that top management commitment and support, user training, effective communication, perceived usefulness, data accuracy, project management, clear goals and objectives , Consultant support and change management with B value in decreasing order accordingly were found to be positively associated with the dependent variable (successfulness of ERP). With 95% confidence interval with p value less than 0.05 top management commitment and support, user training, effective communication, perceived usefulness, data accuracy, project management, clear goals and objectives and Consultant support were found to be the significant predictors of success fullness of ERP implementation in ethio telecom warehouses. While change management with p value greater than 0.05 was not the significant predictor of successfulness of ERP implementation in ethio telecom warehouses.

With regard to success indicators of ERP implementation the descriptive data analysis made on SPSS shows that the grand mean value for all the 10 constructed success indicators is 4 implying that all the factors were accepted by the respondents as the success indicators of ERP implementation. With the mean value from the highest to the lowest Job relevance, result demonstrability, organizational impact, reporting capability, system reliability, user satisfaction, individual impact, output quality, compatibility & project success as in the case of ethio telecom warehouses were accepted by the respondents as a success measurement of ERP system.

5.2 Recommendations

Based up on the findings discussed so far the following recommendations were suggested

- The company should give a great emphasis for change management whenever something new is introduced to the company the company should work on change management so that the system will be aligned with the environment and it will be adopted by the concerned employees easily.
- The company should work more on top management commitment and support.
- The company should also work more on user training and make sure each user of ERP in the company will go along with the system easily.
- The company should also work more on effective communication so that information with regard to ERP will flow smoothly.
- The company should work more on perceived usefulness and make all users of ERP feel that using ERP will enhance their performance.
- The company should give great attention to data accuracy and work on its improvements more in order to get the possible advantages of the system.
- The company should work more on project management.
- The company should also work more on clear goals and objectives.
- The company should also work more on consultant support in order to get the possible advice from the vendor and use it effectively.
- For other companies who would like to adopt ERP system they should first know and understand those critical success factors that will drive ERP success.
- After adopting ERP system companies need to give training continuously during the implementation period and after implementation.

5.3 Limitation of the Study

This study being conducted only on ethio telecom warehouses located in Addis Abeba and didn't include regional warehouses of the company and other company warehouses is said to be limited with small sample size and this is the main short coming of this thesis. And it would have been better to conduct this study with larger geographical area including regional warehouses and other company warehouses with larger sample size. For this reason further studies should be conducted on this subject matter to the future including different company warehouses and larger sample size.

Appendices: Appendix I

QUESTIONNIRE

ADDIS ABABA UNIVERSITY
SCHOOL OF COMMERCE
DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT

Researcher: Haregewoin Tadese

Dear Respondents

The main purpose of this questionnaire is to gather information with regard to critical success factors of ERP system implementation in ethio telecom warehouses for the partial fulfillment of the requirements for Masters of logistics and supply chain management at Addis Ababa University. The information you provide is highly confidential and is only going to be used only for the purpose of this study. Therefore, your genuine response to the questions is vital for the quality and successful completion of the study. The accuracy of the information you provide highly determine the reliability of the study.

Contact Address: Tele - +251 911 514158
E-mail – hareg12.ht@gmail.com

Thank you in advance

Section 1: Background Information

1. **Gender**

   0- Male 1-Female

2. **Age**

   1)25-30 year 4)51-60 year

   2)31-40 year 5) above 61 year

3)41-50 year

3. **Educational status**

1-Secondary education 4-Master degree

2-Collage Diploma 5-Doctoral degree

3-BA/BSC

4-Your service year:

1) 1-5 year 4)16-20 year

2) 6- 10 year 5) 21-25 year

3)11-15 year 6) above 26 year

Section 2: Critical Success Factors in Enterprise Resource Planning (ERP)

5. Please read each statement carefully and show the extent of your agreement on the statements by **circling the** numbers in the column using the following rating scale (Liker Scale).

Where: 1=Strongly Disagree 2= Disagree 3=Neutral 4=Agree 5=Strongly Agree

Factors	Scale				
Top management commitment and support					
There is top management support to technological innovations	1	2	3	4	5
Top management provide committed leadership for ERP implementation	1	2	3	4	5
Top management supports the ERP implementation project positively and enthusiastically	1	2	3	4	5
Top management provide sufficient incentives for the purpose of ERP	1	2	3	4	5

implementation projects					
Project management					
The ERP team had the commitment to advocate and manage the ERP implementation project	1	2	3	4	5
There were sufficient communication channels to let users know the project progress and to help them solve problems	1	2	3	4	5
There were Sufficient evaluation to measure the operations of the new ERP system	1	2	3	4	5
User Training					
There is adequate training material on ERP modules in ethio telecom	1	2	3	4	5
There is continuous training on new technologies among staff	1	2	3	4	5
Users were given the opportunities to perform test in the ERP system before it was implemented	1	2	3	4	5
Users participated in the system development in the early stages of ERP project	1	2	3	4	5
Effective communication					
The ERP team was well prepared to communicate with the users	1	2	3	4	5
The ERP team clearly understand the goals/objectives of ERP implementation	1	2	3	4	5
Senior encouraged and awarded staff for their suggestions and ideas on the ERP implementation	1	2	3	4	5
Arrival of a new system is always communicated to employees	1	2	3	4	5
Data accuracy					
Data transfer from previous system to ERP systems was accurate	1	2	3	4	5
All data required by users was loaded in to the ERP system from the old system	1	2	3	4	5
Change Management					
Management approach to change was successful in managing the	1	2	3	4	5

transition to ERP					
Adequate resource have been given for change	1	2	3	4	5
Recognizing employees for contribution to the change initiative	1	2	3	4	5
Management asked employees what should change, more than they told employees what will	1	2	3	4	5
Clear Goals and objectives					
Adoption and full implementation of ERP systems is in line with the organization's mission and vision	1	2	3	4	5
ERP implementation is part of our organization's long term strategy	1	2	3	4	5
Work culture that favors collaboration is important to ERP implementation	1	2	3	4	5
The ERP system is customized to organizational needs	1	2	3	4	5
Perceived usefulness					
Using the ERP system improves my performance	1	2	3	4	5
Using the ERP system improves my productivity	1	2	3	4	5
Using the ERP system improves my effectiveness	1	2	3	4	5
Over all, using ERP system is very useful in my job	1	2	3	4	5
Consultant support					
Consultant led in a right direction during ERP implementation	1	2	3	4	5
Consultant helps to a successful ERP implementation	1	2	3	4	5

Section 3: Success indicators in Enterprise Resource Planning (ERP)

6. Please read each statement carefully and show the extent of your agreement on the statements by **circling the** numbers in the column using the following rating scale (Liker Scale).

Where: 1=Strongly Disagree 2= Disagree 3=Neutral 4=Agree 5=Strongly Agree

Success indicators	Scale
User Satisfaction	

I am very satisfied with the information quality of the ERP system.	1	2	3	4	5
I am very satisfied with performance of the ERP system.	1	2	3	4	5
Over all I am very satisfied with the ERP system.	1	2	3	4	5
Individual Impact					
With the ERP system, I don't need to do "repetitive work"	1	2	3	4	5
The ERP system helps me to make effective decisions.	1	2	3	4	5
The ERP system helps me to improve my performance in my work	1	2	3	4	5
Organizational Impact					
With ERP system, my organization saves operating costs.	1	2	3	4	5
With the ERP system, my organization increases revenue.	1	2	3	4	5
ERP systems implementation leads to major organizational changes	1	2	3	4	5
The ERP system can reduce the lead time of activities	1	2	3	4	5
Project Success					
The ERP implementation project was complete on time and within budget	1	2	3	4	5
The scope of our ERP system is well matched with our company's needs.	1	2	3	4	5
The ERP implementation project was completed within the budget as initially planned.	1	2	3	4	5
Output Quality					
The quality of the output get from the ERP system is high	1	2	3	4	5
I have no problem with the quality of the ERP system out put	1	2	3	4	5
Job relevance					
In my job, usage of the ERP system is important	1	2	3	4	5
In my job, usage of the ERP system is relevant	1	2	3	4	5
Result Demonstrability					
I have no difficulty telling others about the results of using the ERP system	1	2	3	4	5
I believe I could communicate to others the consequence of using the ERP system	1	2	3	4	5
Compatibility					
I have no difficulty in exporting data from the ERP system to other system or software I currently use	1	2	3	4	5
I have no difficulty in importing data to the ERP system from other systems or	1	2	3	4	5

software I currently use					
System Reliability					
I think ERP system is reliable	1	2	3	4	5
I don't worry about data loss when I use ERP system	1	2	3	4	5
Reporting Capability					
The report from ERP system are very useful	1	2	3	4	5
The report generated from ERP system helps for strategic/tactical/operational decision	1	2	3	4	5

If there is any other issue/ problem that you observed in relation to ERP implementation Please write down here;

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…
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Thank You Again!

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