



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

ASSESSEMENT OF THE EFFECT OF ENTERPRISE RESOURCE  
PLANNING SYSTEM IN THE LOGISTICS ACTIVITIES OF ETHIO  
TELECOM

BY  
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JUNE, 2017  
ADDIS ABABA, ETHIOPIA

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A THESIS SUBMITTED TO ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE IN  
PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF  
ARTS IN LOGISTICS AND SUPPLY CHAIN MANAGEMENT

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JUNE, 2017  
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## **Declaration**

I declare that this thesis is the result of my independent research work on the topic entitled ‘’ Assessment of the Effect of Enterprise Resource Planning in the Logistics Activities of ethio telecom’’ in partial fulfillment of the requirements for the Degree of Master of Art in Logistics and Supply Chain Management at Addis Ababa University School of Commerce. It is my original work and all the references used in the study are acknowledged.

## **Dedication**

This thesis is dedicated to the memory of my mother Adanech Baruda, who would have been happy to see my success.

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## **ACKNOWLEDGEMENTS**

Above all I would like to thank my Lord God and the mother St. Marry who is the reason for my existence and gave me their grace to accomplish this research paper successfully. Then my deepest gratitude goes to my advisor Dr. Mengistu Bogale for his valuable comments and intellectual guidance. I would also like to extend my deepest appreciation to my families and friends for their continuous and valuable support during my study. I have got all your support and encouragement throughout my study.

## **List of Abbreviations and Acronyms**

IT	Information Technology
ERP	Enterprise Resource Planning
SPSS	Statistical Package for Social Science
CRM	Customer Relation Management
SWAAZ	South West Addis Ababa ethio telecom Zone Office
EAAZ	East Addis Ababa ethio telecom Zone Office
SAAZ	South Addis Ababa ethio telecom Zone office

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## **ABSTRACT**

*The major objective of this study is to assess the effect of ERP system on the logistics activities of ethio telecom with respect to ERP system usage factors of the selected company, IT Infrastructure, System Quality, User Training, User Support and Communication. Quantitative research approach was used in the study. Descriptive and explanatory research design was used to identify ERP system factors and to assess the effect of ERP system on the organization's logistics performance of the case company. The total population was used to assess the effect of ERP system in the logistics activities within the selected three ethio telecom zone offices in Addis Ababa. The data was collected using questionnaires from the population. All the effect of ERP system factors was found to have positive and significant correlation with the dependent variable which is organization's logistic performance. The ANOVA test result showed that, the value of  $R$  and  $R^2$  obtained under the model summary was statistically significant. The multiple linear regression analysis revealed that, 2 of the 5 independent variables (IT infrastructure and System Quality) have a statistically significant relationship to predict organization's logistic performance. The other three variables (User Training, User Support and Communication) are not statistically significant to predict organization's logistics performance. ERP System Quality accounts the largest share to explain the variation of organization's logistics performance. Hence, the researcher has recommended that the organization's logistics performance is impacted more by the ERP System Quality. Therefore, ethio telecom has to do more and more to upgrade its ERP system server capacity.*

**Key Words:** IT Infrastructure, System Quality, User Training, User Support and Communication

# CHAPTER ONE: INTRODUCTION

## 1.1 Background of the study

ERP is a software solution integrating the various functional spheres in an organization- a link through the entire supply chain, aimed at best industry and management practices for providing the right product at the right place, at the right time, at least cost. ERP software is the backbone of many big enterprises in the world today (Momoh, A., Roy, M. & Shehab, E.). These commercial packages promise the seamless integration of all the information flowing through a company- financial and accounting information, human resource information, supply chain information and customer information (*Davenport,1998*)

Flows in a logistics system includes flow of materials, merchandise flow, money flow and information flow. ERP system provide the transactional tracking of global or national visibility of information within a company and across its supply chain. This real-time information helps a supply chain to improve the quality of its operational decision. ERP system keep track of the information (*Chopra & Meindl,2007*)

Enterprise resource planning helps organizations to integrate their information flow and business processes. They typically support the different departments and functions within the organizations by using a single database that collects and stores data in real time. When ERP system is fully applied in a business organization, they can provide many benefits. */Davenport,2004/*

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 (*Dimitrios et.al., 2011*).

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 note that most multinational firms are using ERP software packages and even more small and midsize companies are on the route of adopting them. An effective business strategy centers on an

aggressive, efficient use of information technology; for this reason, the ERP systems have emerged as the core of successful information management, and the enterprise backbone of the organization. A successful ERP system will streamline processes within a company and improve its overall effectiveness, while providing a means to externally enhance competitive performance, increase responsiveness to customers, and support strategic initiatives (Vidyaranya, 2005).

Telecom industry becomes tremendously changed time to time with vast and rapid scope. Telecom sector has also an opportunity to generate large amount of revenue. Telecom industries have high impact on economic, social, cultural and different sectors of the country.

To achieve its vision, mission and objectives the use of information technology is mandatory, which requires to develop and maintain modern information and communication network infrastructure in order to enable it to achieve its objectives.

According to Nichols, (1998) information technology “encompasses the information that business creates and use as well as a wide spectrum of increasingly convergent and linked technologies that process the information”. The participants in the logistics activities can be linked by information technology. In this research paper the researcher focused to assess on the information related to the flow of materials, products and services using Enterprise Resource Planning (ERP) in ethio telecom. ERP system in Ethiopia is implementing starting with a few years ago. Ethio telecom is using ERP system starting from December, 2011. The study assessed the effect of ERP system in the logistics activities of ethio telecom.

## **1.2 Statement of the problem**

Enterprise Resource Planning systems are software systems for business management, integrating modules that support 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. The challenge most entities encounter is in consolidating these heterogeneous systems within the organization. Many companies prefer a system platform that would provide integration for processes throughout the organization’s divisional systems to replace the previous transactional systems. To handle challenges encountered by various transactional systems within an entity,

“ERP systems are configurable information systems packages that integrate information and information-based processes within and across functional areas in an organization” (Kumar, 2000).

ERP system integrates key business and management functions and provide a view of the happenings in the company, in areas of finance, human resource, sales, etc. (Momoh et al.,2010). Enterprise resource planning (ERP) system has been one of the most popular business management systems, providing benefits of real-time capabilities and seamless communication for business in large organizations. However, not all ERP implementations have been successful. Since ERP implementation affects entire organizations such as process, people, and culture, there are a number of challenges that companies may encounter in implementing ERP systems (Ibrahim, 2010).

*Henk (2003)*, pointed out that implementation of ERP does not necessarily guarantee success in organizations. Its effectiveness depends on success on the implementation process and organizational set up. The implementation process is explained by ERP implementation factors (*Syeda, 2013*).

In Ethiopia little has been done on the ERP system usage. The implementation of ERP system in logistics strengthens the cooperation between all functional departments within the organization and external providers, companies and clients, involving in the logistics process. The implementation of ERP system it is not only the modernization of the corporate system. Despite the significant benefits that ERP software packages provide in managing and integrating cross-functional business process there are several difficulties and barriers that relate to such implementation. Moreover, ERP system are complex and implementing one of them can be challenging (Davenport,1998). Addressing the difficulties of ERP implementation helps to plan better and facilitate a more successful ERP implementation (*Ibrahim, 2010*).

Based on the information above this research has been done to assess the effect of Enterprise Resource Planning in the logistics activities of ethio telecom specially in the movement of commercial goods and Money. Questionnaires have been distributed to warehouse staffs, section supervisors and zone managers and to make sure the existing challenges and problems that require to conduct this research.

Staffs, Supervisors and section managers are complaining on the smooth functionality of the ERP system at their respective places and availability of products in the system whenever needed and staffs have high complained about the delay of payments. This affects the day to day operation of the company. In addition to this there is no equal understanding and using ERP system within the employees. Inefficiency of back office technical support is also another bottleneck of using ERP system.

Therefore, the researcher on the assessment of the Effect of ERP system in the logistics activities of ethio telecom enable to ethio telecom to identify major problems related the flow of goods and money on ERP system utilization and able to enhance the logistics activities of the company.

### **1.3 Research Questions**

Based on the research problem stated above, this study was conducted to find answers for the following research questions: -

1. How IT Infrastructure of ERP system affects the logistics performance of ethio telecom?
2. How System Quality of ERP system affects the logistics performance of the selected company?
3. How User Training, User Support and Communication affect the logistics performance of ethio telecom?

### **1,4 Objective of the Study**

This study has general and specific objectives.

#### **1.4.1 General Objective of the study**

The General Objective of the research is to assess the Effect of Enterprise Resource Planning /ERP / system in the logistics activities of ethio telecom and to recommend possible solution for the gap.

#### **1.4.2 The Specific objectives of the study**

The specific objectives of the study are

- To examine the effect of IT infrastructure of ERP system on the logistics performance of ethio telecom
- To assess the System Quality of ERP system on the logistics performance of the selected company

- To see the level of User Training, User Support and Communication on ERP system and their effect on logistics performance of ethio telecom.

## **1.5 Significance of the study**

The finding of this research will provide deep understanding for the company as well as the employees about the ERP system functionality to support the logistics activities of the company when having successful system, showing the practices on ERP system, the challenges faced and how these challenges and obstacles can be solved in order to have the smooth flow of goods, money within the organization.

This research will be also used as a reference for further researchers in the area to find additional finding and recommendation. This research will also able to other organization, who do not deploy ERP system in their respective organization, to have experiences from ethio telecom's ERP system support in its logistics activities.

## **1.6 Scope of the study**

The study focused on the assessment of Enterprise Resource Planning system in ethio telecom, its effectiveness in the logistics activities of the company, challenges and problems which affect its effectiveness and assessed the awareness of staffs, supervisors and management from different divisions of the company

Ethio telecom has six zone offices in Addis Ababa and eight regional offices out of Addis Ababa. Each zone and region have many sub offices under them. The researcher mainly focused on the ethio telecom's three zonal offices in Addis Ababa namely, SWAAZ, EAAZ and SAAZ. The reason of selecting these offices is because of distance constraint and similarities of the practices of using ERP system in the logistics activities throughout the country with in ethio telecom's offices.

Since ERP system is being implemented since December, 2011, the feedback received from the respondents were based on their five years experiences. The data used by the researcher also based on these five years.1.7

## 1.7 Operational Definition of Terms and Concepts

The basic terms applied in this study were based on the following definition:

- **Ethio telecom:** - The only telecom service provider in Ethiopia owned by the government of the democratic republic of Ethiopia rendering telecom services like: - Fixed line telephone, Wireless telephone, 2G, 3G and 4G mobile telephone, 3G, 4G, and Broadband internet, International calls, International roaming, Wi-fi, rural telecom, telecom video conference, and other many types of telecom services. (Company's profile)
  
- **Enterprise Resource Planning (ERP):** - ERP is a software solution integrating the various functional spheres in an organization- a link through the entire supply chain, aimed at best industry and management practices for providing the right product at the right place, at the right time, at least cost. ERP software is the backbone of many big enterprises in the world today (Momoh et al.,2010). These commercial packages promise the seamless integration of all the information flowing through a company- financial and accounting information, human resource information, supply chain information and customer information (*Davenport,1998*)
  
- **Logistics Activities:** - According to *Waters, (2003)*, the followings are some of the logistics Activities, these are, Procurement or Purchasing, Inward transport or traffic, Receiving, Warehousing or store, Stock control, Order picking, Materials handling, outward transport, physical distribution of materials, recycling, returns and waste disposal, Location and communication.

## 1.8 Organization of the study

The Study is organized in to five chapters: -

The first chapter shows background of the study, statement of the problem, research question, research objectives, significance of the study, scope of the study, limitation of the study, definition of terms and organization of the study.

Chapter two shows assessment of different literatures having different theories and concepts in Enterprise Resource Planning system and related empirical reviews in relation to the company's actual practices.

In chapter three the research methodology and design are shown in detail. In chapter four data collection and analysis of the data are clearly shown in chapter five summary, conclusions, and recommendations are presented. Finally, the list of bibliography and sample of questionnaire and other attached as appendixes.

## CHAPTER TWO: LITERATURE REVIEW

### 2.1. Theoretical Literature

This chapter presents the review of related literatures and imperial facts. It includes definition of logistics, the role of logistics practices, the main logistics activities, logistics challenges, the role of information technology (IT) in logistics activities, the meaning of Enterprise Resource Planning (ERP), benefits of ERP system, challenges of ERP system, Integration between business functions using ERP system, the reason of ERP implementation in ethio telecom and conceptual framework.

#### 2.1.1. Definitions of Logistics

Since the early 1990's, the business outlook has changed. Due to the globalization, the competition has demanded the customer should get the right material, at the right time, at the right point and in the right condition at the lowest cost. To be a world class solution provider it is mandatory for organizations to professionally manage their logistics and leveraging their technology infrastructure. Logistics has become a part and parcel for every business today. No business with marketing, manufacturing or project execution can succeed without logistics support. *(Dr. B. Neerajaa ,2014*

Logistics is defined as “Planning implementing and controlling the physical flow of material and finished goods from point of origin to point of use to meet customer`s need at a profit. It is essentially a planning process and an information activity So it is an integrative process that optimizes the flow of material and supplies through the organization and its operations to the customer. The word logistic has originated from Greek word ‘Logistikos’ and the Latin word ‘Logisticus’ which means science of computing & calculating. During World War II logistics gained importance in army operations covering the movement of food, medicines, men & equipment across the border. Today It has acquired a broader meaning and is used in the business for the movement of material from suppliers to the manufacturer and finally the finished goods to the consumers (Dr.B. Neerajaa,2014)

According to Dr.B. Neerajaa,2014, ‘the term Logistics Management encompasses the total Flow of materials, from acquisition of raw materials to the delivery of the finished product to the ultimate consumer and the counter-flow of information that controls and records the material movement.

The relations between the activities of demand creation and physical supply illustrate the existence of the two principles of interdependence and balance. Failure to co-ordinate any one of these activities with its group-fellows and also with those in the other group, or undue emphasis or outlay put upon any one of these activities, is certain to upset the equilibrium of forces which means efficient distribution. The physical distribution of the goods is a problem distinct from the creation of demand not a few worthy failures in distribution campaigns have been due to such a lack of co-ordination between demand creation and physical supply. Instead of being a subsequent problem, this question of supply must be met and answered before the work of distribution begins.

It is paradoxical that it has taken almost 100 years for these basic principles of logistics management to be widely accepted. What is logistics management in the sense that it is understood today? There are many ways of defining logistics but the underlying concept might be defined as:

Logistics is the process of strategically managing the procurement, movement and storage of materials, parts and finished inventory (and the related information flows) through the organization and its marketing channels in such a way that current and future profitability are maximized through the cost-effective fulfilment of orders (*Christopher,2011*)

Tilanus (1997) also defines Logistics as ‘the process of anticipating customer needs and wants; acquiring the capital, materials, people, technologies, and information necessary to meet those needs and wants; optimizing the goods- or service-producing network to fulfill customer requests; and utilizing the network to fulfill customer requests in a timely way’. Simply to say, ‘logistics is customer-oriented operation management’

Therefore, the scope of logistics now includes the key SCM business processes, and logistics directly influences the efficiency and effectiveness of these processes. In other words, it affects their ability to meet customers’ needs at the lowest possible cost. More precisely, logistics activities are now executed in the key business processes of SCM. The benefits derived by the involvement of logistics in these processes have already been addressed by Márcia, 2016.

Therefore, with these definitions in mind, logistics can be defined as: the management of the flow of goods from production through to after sales service, including: transportation, warehousing, inventory management, packaging, etc. Generally, the IMF report (2013), logistics

costs average about 12 percent of the world's gross domestic product. The report noted that for many firms, after the cost of goods sold, logistics represents the highest cost of doing business. As markets, technologies and competitive forces change at ever increasing rates the imperative for organizational change becomes more pressing. The paradox is that because organizational structures are rigid, even ossified, they do not have the ability to change at anything like the same rate as the environment in which they exist. The trend towards globalization of industry, involving as it does the coordination of complex flows of materials and information from a multitude of offshore sources and manufacturing plants to a diversity of markets, has sharply highlighted the inappropriateness of existing structures. The driving force for organizational change is logistics. To compete and survive in these global markets requires a logistics-oriented organization. The core process of organization should be supported by a common information system that provides 'end-to-end' visibility of the logistics pipeline from order through to delivery. *(Christopher,2011)*

### **2.1.2. The role of logistics practices**

Effective logistics can provide a major source of competitive advantage to a company, ensuring that it is able to continuously respond more effectively and efficiently than competitors, to customer requirements world-wide. The various functions within a company are increasingly dependent on logistics management in that, as the importance and role of logistics is recognized, the impact which these functions have on the logistics function and vice versa must receive more focused attention.

It can be said that logistics system design and management affect many management functions. Responsibilities for logistics activities such as warehouse management, production and inventory control, or transportation may be scattered among several of these major functions.

The impact of logistics on ancillary functions such as packaging, product design, or manufacturing engineering is also important. Logistics will be affected by the standardization of components, fragility, packaging, and adjustment of products. There are also important links and relationships between logistics management and purchasing, materials management, transport, production planning, packaging, warehousing, inventory control and information technology.

All of these links with, and the impact of, logistics management emphasize the growing role and importance of logistics in the company and the requirement for these interrelationships to be considered in detail by any logistician or logistics manager of an organization.

Logistics' role is to provide time and place utilities. Time and place Utilities facilitate the creation of global scale and scope economies while enhancing a firm's ability to provide high levels of seamless customer satisfaction (*Hoole, 1992*). Similarly, (*Ballou, 1997*) argues that for many firms throughout the world, logistics become an increasingly important value-adding process for a number of reasons.

The most prominent connection between operations and marketing is logistics. The tasks of the logistics function usually necessitate close interactions with both operations and marketing functions. Correspondents of the logistics unit are external and internal customers, distributors, and suppliers. Some major tasks of the logistics include moving, storing, and recording raw materials/work in process/products, ensuring an efficient flow in marketing channels, cost minimization in the entire processing of orders, and thereby, increasing the profitability in general (*Sezen,2005*). Logistics performance can be evaluated by considering logistics costs, customer satisfaction, product availability in the market, conforming to the promised delivery dates and quantities, flexibility in all logistics activities, and efficiency in inventory management.

Logistics is essential for every organization. According to Waters, 2003, 'Logistics has always been a central and essential feature of all economic activity', 'There are few aspects of human activity that do not ultimately depend on the flow of goods from point of origin to point of consumption'. Without logistics, no materials move, no operations can be done, no products are delivered, and no customers are served. Every organization creates products to satisfy customer demand. The operations that create these products need an effective and efficient flow of materials. In this sense, 'materials' are all the goods and services needed to create products. Logistics is the function that is responsible for the flow of materials into, through and out of an organization. Materials move through a series of related activities and organizations between initial suppliers and final customers. These form a supply chain. Each product has its own supply chain. There are many possible structures for supply chains, but the simplest view has materials converging on an organization through tiers of suppliers, and products diverging through tiers of customers. Although it is a single function, logistics consists of a series of related activities.

These range from procurement at the beginning of operations, through to physical distribution at the end. An overall aim for logistics is to achieve high customer satisfaction or perceived product value. This must be achieved with acceptable costs. Every organization depends on the movement of materials, and the way this is done affects costs, profits, relations with suppliers and customers, customer service, and virtually every other measure of performance.

### **2.1.3. The main logistics activities**

The way logistical work is performed continues to change radically, even if its goal remains essentially the same. The scope of logistics, especially in SCM extends beyond the functional level to include the business processes level. (*David ,1999*), logistics has a boundary-spanning nature involving logistics professionals in many SCM activities and responsibilities and logistics strategy influences all business processes of the supply chain. Therefore, the scope of logistics now includes the key SCM business processes, and logistics directly influences the efficiency and effectiveness of these processes. In other words, it affects their ability to meet customers' needs at the lowest possible cost. More precisely, logistics activities are now executed in the key business processes of SCM. In order for the benefits identified by David,1999 to be provided, several logistics activities have to be executed, and they are not limited only to the logistics functional area, but they have also to be developed within the key business processes of SCM. The adopted premise is that these benefits and their contributions will be obtained only if the logistic area executes at least part of these activities.

Logistics is responsible for the movement and storage of materials as they move through the supply chain. But what activities does this include? If we follow some materials moving through an organization, According to Waters,2003 the following activities are normally included in logistics.

- **Procurement or purchasing:** - The flow of materials through an organization is usually initiated when procurement sends a purchase order to a supplier. This means that procurement finds suitable suppliers, negotiates terms and conditions, organizes delivery, arranges insurance and payment, and does everything needed to get materials into the organization. In the past, this has been seen as a largely clerical job centered on order processing. Now it is recognized as an important link with upstream activities and is being given more attention.

- **Inward transport or traffic:** - actually moves materials from suppliers to the organization's receiving area. This has to choose the type of transport (road, rail, air, and so on), find the best transport operator, design a route, make sure that all safety and legal requirements are met, get deliveries on time and at reasonable cost, and so on.
- **Receiving:** - makes sure that materials delivered correspond to the order, acknowledges receipt, unloads delivery vehicles, inspects materials for damage, and sorts them.
- **Warehousing or stores:** - moves materials into storage and takes care of them until they are needed. Many materials need special care, such as frozen food, drugs, alcohol in bond, chemicals that emit fumes, animals, and dangerous goods. As well as making sure that materials can be available quickly when needed, warehousing also makes sure that they have the right conditions, treatment and packaging to keep them in good condition.
- **Stock control:** - sets the policies for inventory. It considers the materials to store, overall investment, customer service, stock levels, order sizes, order timing and so on.
- **Order picking:** - finds and removes materials from stores. Typically, materials for a customer order are located, identified, checked, removed from racks, consolidated into a single load, wrapped and moved to a departure area for loading onto delivery vehicles.
- **Materials handling:** - moves materials through the operations within an organization. It moves materials from one operation to the next, and also moves materials picked from stores to the point where they are needed. The aim of materials handling is to give efficient movements, with short journeys, using appropriate equipment, with little damage, and using special packaging and handling where needed.
- **Outward transport:** - *takes* materials from the departure area and delivers them to customers.
- **Physical distribution management** is a general term for the activities that deliver finished goods to customers, including outward transport. It is often aligned with marketing and forms an important link with downstream activities.
- **Recycling, returns and waste disposal:** - Even when products have been delivered to customers, the work of logistics may not be finished. There might, for example, be problems with delivered materials – perhaps they were faulty, or too many were delivered, or they were the wrong type – and they have to be collected and brought back. Sometimes there are associated

materials such as pallets, delivery boxes, cable reels and containers which are returned to suppliers for reuse. Some materials are not reused, but are brought back for recycling, such as metals, glass, paper, plastics and oils. Finally, there are materials that cannot be used again, but are brought back for safe disposal, such as dangerous chemicals. Activities that return materials back to an organization are called reverse logistics or reverse distribution.

- **Location:** -Some of the logistics activities can be done in different locations. Stocks of finished goods, for example, can be held at the end of production, moved to nearby warehouses, put into stores nearer to customers, passed on to be managed by other organizations, or a range of alternatives. Logistics has to find the best locations for these activities – or at least play a significant role in the decisions. It also considers related questions about the size and number of facilities. These are important decisions that affect the overall design of the supply chain.

- **Communication:** - Alongside the physical flow of materials is the associated flow of information. This links all parts of the supply chain, passing information about products, customer demand, materials to be moved, timing, stock levels, availability, problems, costs, service levels, and so on. Co-ordinating the flow of information can be very difficult, and logistics managers often describe themselves as processing information rather than moving goods.

Depending on the circumstances, many other activities can be included in logistics. Sometimes an organization might include sales forecasting, production scheduling, customer service management, overseas liaison, third party operations, and so on. The important point is not to draw arbitrary boundaries between functions, but to recognize that they must all work together to get an efficient flow of materials. (*Waters,2003*).

#### **2.1.4. Logistics Challenges**

There is no denying that availability of adequate logistics facilities is a vital requirement for attracting customers and the satisfaction of employees in the organization. It has been suggested that global business strategies provide the greatest competitive advantage when they are appropriately supported through key value-added logistics activities. A good logistics system has great power to achieve the objectives of the firm. On the contrary, a recent study has blamed poor logistics support facilities as one of the major reasons for the failure to attract customers. With the ever-increasing popularity of globalization of business, better logistics facilities and their management are bound to assume important roles in international business. It is not

surprising that firms in many of the advanced nations are increasingly feeling the necessity to refine their distribution networks to respond to the changing environment. The challenges many less developed countries currently face in developing their logistics systems are legacies of the past. These are fundamental problems inherited not only from their embryonic trappings but also from lack of understanding of logistics' role and importance.

It is clear that problems of logistics systems and barriers to logistics development are unique to each country. The provision of links between productive facilities and consuming units, which is the fundamental role of logistics, is affected by differences in various country specific factors such as geographical features, socio-economic and politico-legal systems, cultural realities, industrial development and resource endowments. (*Mohammed,1997*)

According to (Tarp,2016) poor trade logistics penalize firms that rely on imported inputs and doubly affect exporters, causes long and uncertain delays, and it is unacceptable to most global buyers, especially in the time sensitive apparel and shoe industries. They also mentioned that challenges that face logistics operations have become a great concern at this time since they result in poor performances of logistics.

According to (Fasika,2014) in his research on the 12 types of industries found that long delays in customs and port handling as well as complex tariff for imported items are becoming the challenge for logistics and supply chain processes in Ethiopia. They also found that the major supply challenges are inconsistency of quality raw material during bidding time and final delivery, unavailability of local suppliers for imported items and long processing and delivery time due to lengthy bureaucratic procedure involved in the purchase of the imported raw material. His study also indicated that the major transportation challenges of Ethiopia is having no access to sea (Land-locked country) and back ward transport infrastructure. Due to this the deliver process was expensive and challenging. This hinders the firms' competitiveness.

### **2.1.5. The role of Information Technology (IT) and The Meaning of Enterprise Resource Planning (ERP)**

Information technology (IT) encompasses the gathering, processing, storage, retrieval, display and communication of information or data, normally by means of microprocessor equipment. A critical issue for examination is the integration of IT and logistics operations, as firms employ

logistics information systems to deliver on logistics information needs. Recently, IT has led to an increase in the availability of information on product movement within the supply chain.

Electronic Data Interchange (EDI) reduces the transaction-related costs of co-ordination between firms via a standardization of tasks and communication between chain members. Other IT applications used within retail logistics include the inventory control systems that can receive, store, pick and move goods during warehousing operations under an integrated manner while recently, the use of internet has become extremely common as it supports the dissemination of information among the chain members. (Michael ,2006).

In the light of these developments, IT has enabled the transformation of logistics operations and has played a significant role towards the development of operations. However, past studies indicate the strong relationship between the size of the logistics activities and the level and type of use of IT. Smaller companies faced problems to benefit from the IT use due to a lack of financial resources and relevant capability. (Michael ,2006).

Effective information technology (IT) becomes necessary to support logistics processes. IT may help automate routine logistics activities, thus enabling managers to focus on strategic issues and core competencies. Some studies have reported that IT can improve logistical efficiency, effectiveness, productivity, flexibility, cost, and service quality. Meanwhile, intermediate supply chain activities, such as distribution, can be enabled and supported by the use of IT (Fujun,2006). IT commitment defines the effort committed to IT improvement, including not only resource commitment, such as budget, equipment, and personnel, but also managerial commitment, such as the involvement of top management. The IT adoption has suggested that IT resource commitment may help to improve productivity. In addition, managerial commitment plays a critical role in achieving sustainable competitive advantages. Although IT investment is easily duplicated by competitors, it is difficult to imitate the ways in which firms leverage their investment to create unique IT capabilities, such as resource configurations of technology, infrastructure, and business processes, as well as the related synergies among them ( Fujun, 2006). Resources can be configured appropriately only when IT strategies and business strategies are aligned. Alignment between a firm's IT and business strategies enables it to acquire, deploy, and leverage its IT investments and capabilities effectively in pursuit of its business strategies and in support of its business activities. The effective application of IT depends on the interactions and exchanges that bind IT and line managers. ( Fujun ,2006)

showed that IT executives who participate more in strategic planning believe that they have a better understanding of top management's objectives than do those who participate less.

The increasing emphasis of logistics is creating focus on the use of information technology by the firms. Cost reduction focus can become intense as companies continue to adopt use of information technology to leverage competitive advantages and increase efficiency and effectiveness to enhance their profitability, market share and customer satisfaction (Fujun,2006). Logistics managers therefore need to understand the benefit of technology to enable them align information technology with business strategies to be able to make informed business decision. The reason for IT's potential in achieving logistics success is that it can help the logistics activities to improve their competitive advantages. The literature suggests that IT has the ability to enhance logistics competitiveness by increasing capability, decreasing costs, and improving service and empirical evidence showing that IT is fairly predictive of overall logistics competency. Firms with a high level of IT show higher achievement on performance measures, such as cost reduction, cycle time reduction, and improved quality. IT was also reported to be capable of improving competitive position and enhancing productivity and flexibility. Therefore, IT has the potential to provide significant competitive advantages to firms.

IT has also been cited to have the potential not only to enhance operational efficiency and effectiveness, but also to change the way a business competes IT could be integrated into value chain activities and improve competitive advantages.IT created strategic opportunity and redrew competitive boundaries.

Higher IT may also help improve delivery speed and reliability, customer relations, and order accuracy. The effect of IT on improvement of service quality, however, is much higher when IT is at high level. When IT is at low level, the effect is slight. Higher IT may lead to a higher cost advantage when it is beyond the "strategic necessity" level. When IT is a "strategic necessity" only, a higher level of IT may deteriorate the cost advantage. It is essential to integrate IT systems, align IT strategy and business strategy, and obtain superior IT management skills. (Fujun,2006)

Many definitions of ERP system exist and have been discussed by previous researchers, depending on the angle of the research scope. Eventually, it is likely that those definitions are coiled with the term of "integration ". ERP system is known as a software that integrates all of

the technical and operational applications, information from all the departments into unified database and considered as business solutions to most-organizations (Kadir,2015).

The ERP system is highly demanded among organizations due to the companies' expectation on its benefits but sometimes the benefits are unattainable. This could be due to unforeseen obstacles impacting the success of deploying such system which can be studied from the factors of information quality, system quality and user satisfaction of using the ERP system, (Kadir,2015)

O'Leary,2000 defined Enterprise Resource Planning (ERP) as a computer-based system designed to place companies' major activity areas: planning, production and customer service under an umbrella. ERP system is a software package of different modules such as fixed assets management, controlling, financial accounting, manufacturing, human resources, planning and development and so forth. Each module is business process specific. Generally, companies choose one ready-made package available for their industry but it is also common to select the modules that best meet their needs.

Enterprise resources' planning is full-fledged software that is used to in different organization regardless of the size of the business. Hence this system can be applied in small, medium and large-scale business organizations for a better management of the operational activities. Such software can deliver consistent data across all business functions in real time. Real time refers to data and processes that are always current.

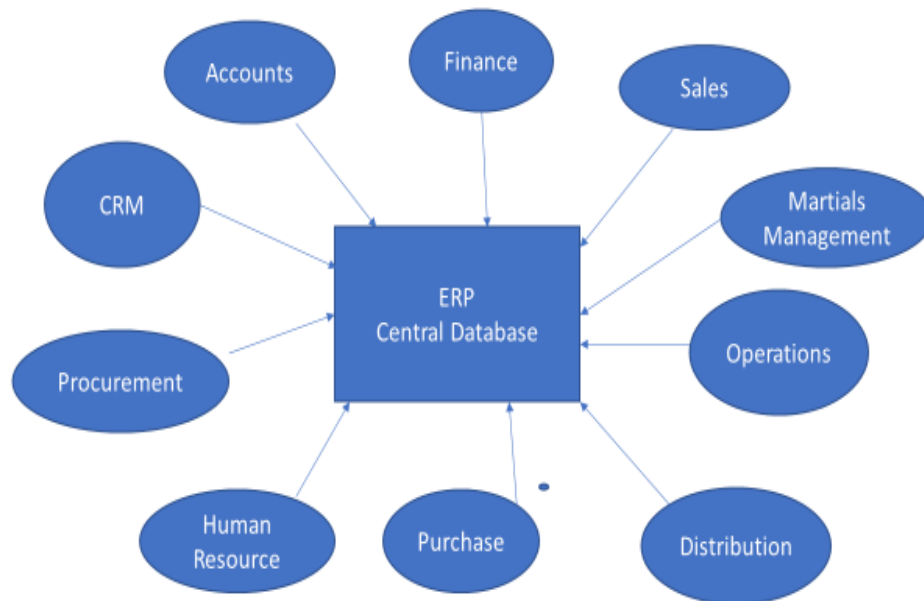
According to Fui-Hoon,2002 Enterprise Resource Planning (ERP) refers to large commercial software packages that promise a seamless integration of information flow throughout in organization by combining various sources of information into single software application and a single database.

Enterprise resource planning systems 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 or I-procurement. The architecture of the software facilitates transparent integration of modules, providing flow of information between all functions within the enterprise in a consistently visible manner.

Apart from the ideas mentioned above the major characteristics of ERP systems are: a packaged software system designed for the client environment, the integration between the modules and

across entire organization, access to data in real time, data storing and retrieving processes in an enterprise-wide database, and management and analysis functionalities. Moreover, ERP systems are expected to have additional characteristics such as support for multiple currencies and languages (but not Amharic), which is critical for multinational companies, and support for specific industries.

Hence; companies who are implementing the ERP system are benefiting from the single integrated system by transforming or reengineering their mostly legacy information system. And it is also defined as a method for the effective planning and controlling of all the resources needed to take, make, ship and account for customer orders in a manufacturing, distribution or service company. ERP systems are configurable information systems packages that integrate information and information-based processes within and across functional areas in an organization (Henry,2002).



Integrated ERP system Structure ( Anwer,2013)

### **2.1.6. Benefits of ERP system**

Nowadays, many organizations invest heavily in implementing ERP system, expecting positive benefits to their organization. Considering the perks that organizations may enjoy such as better customer satisfaction, improved information accuracy and improved decision-making for top management, this robust system became among the most risky investment for Organizations. (Kadir,2015).

What are some of the perceived benefits that lead corporations to commit to the implementation of ERP in their organizations? As indicated by Romm,2002 in common with other types of investment activity the adoption of an ERP system is a purposive intervention by an organization for bringing about a new state of affairs that is judged to be superior to the current state. Botta,2002 indicate that two distinct streams are observed from the literature. The first one focuses on the fundamental corporate capabilities driving ERP as a strategic concept, and the second, on the details associated with implementing an information system and their relative successes and costs.

As indicated by Chen,2001 planning for ERP adoption generally occurs when an organization realizes that current business processes and procedures are incompetent for their current and or future strategic needs. As the result of various external and internal forces, ethio telecom operating environment is changing and their working systems are becoming “incompetent”. They are not able to maximize their efficiency and therefore, profit. Any tools that would enable these organizations to reverse this trend must be considered. In order to promote the use of ERP by ethio telecom, a more comprehensive look of the potential benefits that could be achieved must be completed.

Ross,1999 articulated that as a business and strategic perspective implementing ERP is seen as way to improve corporation’s effectiveness and efficiency, reduce their operating, personnel, inventory and IT costs, and improve their productivity, business growth, production scheduling, delivery time, customer service, and overall quality. Additionally, data visibility and timely information is important to make better business decisions.

It is clear that ERP system investments have been categorized as strategic in nature. Literature

review identifies the common goal to be an increase in company sales, reduction in production cost, reduction of lead times, and improvements in customer relationships.

In general ERP systems enhance inter-organization communication and collaboration between different functions and locations for the integrated decision-making process. Standardization of the processes across the unit's works in favor of collaboration as it reduces the number of conflicts between the processes. The single database system encourages communication across locations and functional units through sharing the information. With ERP systems companies are using the same database, which can be accessed on-line, in real-time and simultaneously by many users. Since, virtually all users have access to the same information it improves companies planning and control practices.

Organizations invest in ERP systems to achieve important benefits. These benefits may come in the form of improved business productivity such as shortened lead time, lower cost and efficiency

communication among functional boundaries. Yet these expected benefits are not always visible for ERP implementing companies. An examination of US manufacturing companies found that although ERP systems were very common within the industry, the system did not lead to significant reduction in operating expenses (Nwankpa,2015). In fact, ERP benefits can vary across industries and in many cases, may depend on the implementing firms. Prior literature has attempted to understand the drivers of ERP benefits. (Nwankpa,2015) developed five dimensions of ERP benefits namely, prerational, managerial, strategic, IT infrastructure and organizational and concluded that ERP benefit was a continuous process with benefits realized at different rate in different core processes. Over all ERP benefit was mediated by intermediate benefits and that realizing intermediate benefits was a precondition to achieving overall ERP benefit. According to Nwankpa,2015 reaffirmed the role of intermediate benefits as predictor of overall ERP benefit but also found that customization and organizational mechanisms were strong predictors of intermediate ERP benefits.

#### **2.1.7. Challenges of ERP system**

Implementing an ERP system is not an inexpensive or risk-free venture. In fact, executives believe that ERP system have at least a moderate chance of hurting their businesses because of the potential for implementation problems. Despite

ERP's promises to benefit companies and a substantial capital investment, not all ERP implementations have successful outcomes. (Mohammadreza,2015)

A typical implementation of ERP project is costly, time-consuming and complex undertaking. In fact, many companies have described their ERP implementation being a nightmare. (Chen,2001) explained based on a recent study indicated that 40 % of all the ERP installations manage only partial implementation and 20 % totally fail and the remaining 20% has been fully successful. Depending on how someone is defining failure, the percentage can be even higher. Hence; depending on the degree of failure according to our existing practical situations here are the major ERP challenge areas: -

### Complexity

The complexity of the system implementation arises from the fact that companies have to integrate ERP software with hardware, operating systems, and database management systems and so on. Further, it initiates the changes throughout the entire organization. As ERP software comes in a ready-made package companies are required to adjust their businesses to fit the system requirements. The reasons being that even with the today's art of technology ERP systems do not fit all the requirements of a company. Moreover, changes in one component might cause the collapse of the whole system, which is designed as an integration of separate modules.

### Costs and Benefits

The total implementation costs of ERP include software, hardware, consulting and internal personnel costs, which usually sum to 2-3 % percent of the company's revenues (Chen, 2001). The huge investment has to be weighed against the future economic and strategic benefits that the system should eventually provide. However, the benefits might be difficult to quantify. Non-financial benefits such as improved customer response, strengthened supplier relationships through information sharing and real-time access to operating and financial data can be vital for the growth of many companies but are hard to convert to monetary profits in the cash flow statements. Moreover, it might take years for the companies to take the advantage of the all capabilities ERP systems provide.

In addition to what has been mentioned above Markus, 2000 explain that success depends from the point of view from which you measure it. It can be viewed from many dimensions: in technical terms, in economic, financial or strategic business terms, in terms of smooth running of business operations, from the point of view of managers and employees or from the point of view of customers, suppliers and investors

## Time

On time and within the budget is another success criterion, which in practice is no easy to achieve. Meeting deadlines is a primary concern of the ERP project management as any delay costs the company additional money. The amount of time needed for project is often underestimated. In length, the whole implementation process can take up from three to five years. Chen (2001); explained that, considering today's business dynamics companies cannot afford spending too much time on the technology implementation in spite of all the benefits as competitors might have enough time to overtake them. Moreover, lengthy implementations can increase the risk of project failure; reduce the management and staff commitment, decline productivity and delivery performance and cause the loss of the customers.

## User Training and Education

Walti,1999 indicated that training and change management are matters that affect all the phases of the ERP implementation. Not surprisingly, there are many challenges related to training as each user group has different needs, preferences and learning potential. Users have to learn only those functions that are related to their tasks in addition to the understanding the new processes and procedures. Moreover O'Leary,2000 also explained that training is expensive and underestimating the needs and the requirements are the reasons for exceeding the budget. Skilled employees tend to switch their jobs and training of new employees will remain a continuous effort. However, the importance of training cannot be neglected and it is not something that should be conducted only before or after the implementation but rather it has to be present in each part of the ERP life cycle. Moreover, ERP training has been identified as a critical requirement in ERP implementation and this has led to creation of an entire industry providing ERP training.

Further, literature shows that the realization of certain benefits is contingent on certain prerequisites (Kumar,2000). Having for example very well-trained users would allow for the realization of more ERP implementation benefits than having users without training who might be resistant to change and thus anticipate the achievement of benefits. In this case, training would give support for the realization of operational, strategic and managerial benefits.

According to Vayyavur,2015 the implementation of ERP has far-reach impacts on employees and their roles. Since ERP Influence Corporation between departments and processes, data integration ad structures, the role of users and their duties change in several ways. First, the employees should learn to cope with the new and complex system. ERPs introduce a number of functionalities and have a greater impact on business processes. The integration of these functionalities and processes alters the role of employees. As the processes, data and departments integrate employees' role and their everyday work changes. The proceeding of business processes over a logical and united database leads to increasing dependencies between departments and individuals. Considering the vastness of the impact of ERP on employees, training becomes an integral success factor.

Vayyavur, 2015, pointed out that Inadequate user training and failure to understand how ERP system works are responsible for many problems ERP implementation and failures. The implementation of ERP often fails due to lack of proper training. Scholars and researchers consider user training and education as an important factor of successful ERP implementation. The key reason for education and training program is to ensure the users are comfortable with the system, and increase their expertise and knowledge. ERP concepts, system features, and hands on training are vital aspects of ERP implementation.

The training needs not only to cover how to use the new system, but also the new processes and understanding the integration of those processes within the system. Lack of adequate training makes users invent their processes and ways to use the part of the system they can manipulate. Therefore, the full benefits of ERP are not realizable unless the end users have the necessary know-how to use the system. The management should develop training strategies in advance and update them continually. ERP training and education refers to the process of offering management and employing logic and overall concept of ERP systems. (Vayyavur,2015)

The content of the training program should focus on logic and concepts of ERP, features of ERP system software and hands-on training. Continuous training is critical to meet the changing

needs of the business and enhance employees' skills. Although it possible to change organizational hardware and software easily, it may take months to adjust learning curves with an organization. A major challenge in ERP implementation is the selection of the adequate training for the end-user and education. ERP is a complex system that needs adequate training and education to enable end-users to use it effectively and efficiently. In addition, end-user training and education enhances the level of knowledge and proficiency, thus improving individual performance and consecutively the performance of the organization.

According to Nah ,2003 sufficient training has the potential to improve the profitability of ERP systems while lack of training acts as a major hindrance. The organization can use the training and education programs to build an attitude toward the system. It may also help ERP users to adjust effectively to the organizational change taking place within the organization. End-user training increases the chances of ERP system use and success. Somers et.al.2004, concluded that implementing ERP without adequate training may have drastic undesirable consequences.

Therefore, the commitment of the top management and executives is vital in sustaining the ERP training program. Scholars agree on the importance of starting a training program with detailed users training requirement analysis. The aim of the analysis is to understand the present level of knowledge, how to deliver information, number of users to be trained and the courses or content of the curriculum. On the onset of the project, employees may require a large volume of training and support to make them comfortable with the ERP command language and a new business process. Employees and other trainees need to feel the training is relevant to their current and future jobs. Therefore, it is fundamental to inform employees the essence and benefits of the training. The success of the training program depends on its ability to deliver training and knowledge at the individuals' level. In an organization, ERP training needs to be delivered to the managerial personnel, key end-users, general end-users and the trainers. (Vayyavur,2015),

### **User participation and support**

User participation and involvement are part of the ERP systems. End users are the people who have direct contact with the ERP systems. User participation refers to involvement in the system development and implementation process by representatives of the target user groups. There are two main areas of user participation when a company or organization decides to implement an ERP system. The first area is when a user participates in the stage of definition of the company's

ERP system needs and the second area is user participates in the implementation of the ERP (Esteves, 2005). Understanding the contributions of user participation in ERP implementation will lead to successful implementation. One of the problems related to ERP implementation is the incompatibility of process features with organization information needs. To address this problem users, need to be allowed to participate in the implementation of the ERP system since they are familiar with the business processes and the knowledge domain in their functional units. Involving users in the stage of defining organizational needs provides the users with an opportunity to mould and shape the system based on their priorities and business requirements and thus control the outcome (Esteves ,2005). When users are involved or participate in these stages they are bound to react positively to the potential of ERP system. (Matende,2013)

User support refers to the psychological state of business users toward the changes caused by the implemented ERP system, as well as toward the use of the system for performing their tasks (Wang,2003). The users of an ERP system are usually the ones required to adjust their daily working practices to the new system's requirements. Apparently, becoming familiar with a new ERP system is not an easy task and involves hard working and patience from the part of users. In order to favorably affect users' perceptions about new technology, the real benefits and advantages of using the ERP system need to be continuously reminded. Otherwise, users are not motivated to support the ERP system in that they are not willing to cooperate. This situation provokes conflicts in the relationship and hinders communication (Wang,2003). Therefore, a high degree of user support will strengthen communication effectiveness and conflict resolution. (Dimitrios,2011).

## **Communication**

Effective communication plays a vital role in ERP implementation. Expectations from management at every level of organization need to be communicated to ERP vendors. one of the reasons for unsuccessful ERP implementation is poor communication. Sometimes, communication problems start showing up at the very beginning, i.e., at the time of announcing the purpose for ERP implementation, and it continuous till the end, i.e., informing the organization's staff about the progress and importance of the ERP implementation. Poor communication prevents different parts of the organization from assessing how they will be impacted by the changes in processes, policies and procedures. Communication failures occur

in implementing ERP because no prior experience with large IT projects. Secondly, it is also difficult to identify key contact persons in different departments to be earmarked as ERP implementation ambassadors. (Venkatraman, 2016)

Effective communication is a strong foundation of a trustworthy relationship between external consultants and organizational members. The more consultants and users understand each other, the more effective the communication becomes during the consulting process. Insufficient communication of users' needs, goals and aspirations to the consultants may undermine the implementation of the ERP system (Dimitrios,2011).

## **ERP System Quality**

According to Al-Rawashdeh, 2014, The ERP systems have different type of abstraction. In addition to its complexity and modularity, the basic concept in the ERP system is the standardization and synchronization of information. Thus, most of software quality characteristics and sub-characteristics of ISO/IEC 9126 will be applicable to the ERP system quality model with appropriate modification. Because of the new abstraction type in ERP system, some new software quality characteristics should be involved, which can describe new features of ERP system.

The quality characteristics, functionality, reliability, usability, efficiency, maintainability, and portability have commonly been proposed in most quality models. However, scholars have different opinions while choosing sub characteristics of these characteristics.

The *Functionality* has been defined by ISO as the capability of the software to provide functions which meet the stated and implied needs of users under specified conditions of usage. In order to evaluate such characteristic, it has been divided into four sub-characteristics, namely accuracy, suitability, interoperability, and security. Adapting the functionality of the ERP systems reveals that the systems software should provide its functions, namely financial process, human resource management, supply chain process, manufacturing process and/ or customer service process as per the requirements when it is used under specific conditions.

The *reliability* is the capability of the software to maintain its level of performance under stated conditions for a stated period of time. Reliability has three sub-characteristics consist maturity, fault tolerance, and recoverability. In terms of ERP systems, the reliability refers to the capability

of the systems to maintain its service provision under specific conditions for a specific period of time. In other words, the probability of the ERP system fails in a problem within a given period of time.

The *usability* is the capability of the software to be understood learned, used, and attractive by the users, when used under specified conditions. The usability has set of sub-characteristics, including understandability, learn ability, and operability. The ERP systems should be understood, learned, used and executed under specific conditions.

The *efficiency* refers to the capability of a system to provide performance relative to the amount of the used resources, under stated conditions. To be measured, it has also been divided into three sub-characteristics, namely time behavior, resource utilization an efficiency compliance. Adapting this characteristic to the ERP systems suggests that the systems should be concerned with the used software and hardware resources when providing the ERP systems' functions.

The *maintainability* is the capability of the software to be modified. The maintainability consists five sub-characteristics, including analyzability, changeability, stability, and testability. In this research, any feature or part of the ERP system should be modifiable. As well as identifying a feature or part to be modified, modifying, diagnosing causes of failures, and validating the modified ERP system should not require much effort.

Finally, the *portability* of software refers to the capability of the software to be transferred from one environment to one another. Therefore, the ERP system should be applied using different operating systems; be applied at different organizations or departments; and be applied using a variety of hardware. (Al-Rawashdeh, 2014)

### **2.1.8. Internal Integration between Business Functions using ERP system**

The value of the right ERP system comes from the integration between the modules and the ability to achieve the sought targets, including reductions in paperwork; improved productivity; lower costs; and more reliable performance; cost reduction that distribution and spent on information achieved with an ERP as well as ability to handle time Initially, For example, when getting the full cooperation of suppliers and ERP system makes it possible for decision-making and implement the purchasing operations in a timely manner. This can reduce the inventory costs dramatically and development free capital otherwise invested in inventory.

Another value that is very important but not as easy to translate into money is the value of the process seamless and reliable. ERP users are more successful on the ability to maintain agreements with customers with respect to the full delivery and in a timely manner, and can communicate more effectively on the progress of the project or a specific production order. Also other value but equal in importance, achieve improved productivity because, when properly applied, the ERP system reduces waste of time and material and similar production orders are combined to make more efficient use of the workforce, machines and materials. (Nofal,2013)

In this phase of integration, organizations must focus on ensuring internal integration among their functional areas. Enterprise resource planning (ERP) systems are integrated business transaction processing and reporting systems that many companies have implemented in recent years. ERP software applications support the re-engineering of business processes and form the foundation for an integrated organizational value system. A basic definition of ERP is a system that tracks transactions that, in turn, trigger business processes involving organizational resources (people, materials, and technology).

Understanding the resources consumed allows an organization to leverage these resources more productively and, in theory, achieve a competitive advantage. ERP systems serve as the organization's "backbone," providing fundamental decision-making support. ERP systems add a "process logic" to an organizational information system and create a fundamental discipline in business processes. In the past, managers in one functional area often made decisions independent of other functional areas but ERP systems provide decision-makers with a unified view of the organization and effectively force people to interact in a single system, even if they would prefer not to!

ERP systems help integrate the areas of customer order management, manufacturing planning and execution, purchasing, and financial management and accounting. ERP systems enable people in these very different parts of the business to communicate and share information with one another. The new ERP holds the promise of being able to effectively link the organization's functions and key business processes together. ERP systems are integrated business transaction processing and reporting systems designed to look at business transactions from a process rather than a functional view.

A Process Model SCM for Value System Creation were first developed, ERP systems held the promise of being able to sit "on top" of legacy systems, or alternatively, data from legacy

systems were migrated over to ERP databases. Extracting data from the legacy systems and making it available in a desired format to all people in all functional areas increased visibility to transactional data throughout the business

The problem of disparate systems being used by different functional groups and business units is an on-going problem. One company we worked with comes immediately to mind. As with many organizations, this company had grown through acquisitions, and had many global locations with disparate software systems, databases, and decentralized buying activities. The company may have had the same supplier supplying different locations yet was unable to leverage these purchases owing to a lack of data. An important step for this company would be to “scrub” its data and apply data warehouses to consolidate purchase data to enable better coordination between the units.

This should lead to an optimization of the supply base considering the total cost of supplying key commodities to different locations using a combination of local and international suppliers. Similarly, this company’s distribution network should be configured to optimize inventories, spare parts, commonality in product designs, and improved coordination between sales and distribution units within the global organization.

## **2.2. Empirical Review**

### **2.2.1. The reason of ERP implementation in ethio telecom**

Many organizations invest heavily in Enterprise Resource Planning (ERP) system, expecting positive benefits to their organization by implementing such system, and telecommunications company is not excluded. (Kadir,2015)

For a large organization to be able to harmonize its complex operations allows it to focus its efforts on resources with the most profit potential. ERP systems can provide dependable data that can be used throughout the company. This is especially true in coordinating the marketing, sales and customer relationship functions. Before ERP, it was nearly impossible to implement complex, responsive marketing, sales, or logistics activities. Information sharing through ERP can result in exchanging information for inventory thus reducing costs and transferring information for time, helping the company to be more open to customer requests. Data sharing with vendors, including actual and forecasted sales, as well as future plans and forecasts, the supply chain and implements

collaborative replenishment approaches.

Human resources functions can be improved through ERP by removing redundancy and tediousness of daily activities. This allows more time to be spent on value-added duties, which in turn leads to a more fulfilling job for employers. As employees become more empowered, they become more involved in decision making. With the right training and guidance, they can make decisions on their own without the close, watchful eye of their supervisor, allowing their supervisor to spend more time on value-added activities. (Forcht,2007)

For the developing world, a modern telecommunications infrastructure is not only essential for domestic economic growth, but a prerequisite for participation in increasingly competitive world markets and for attracting new investments. In the advanced industrial countries of Europe and North America, universal telecommunications services have penetrated every sector of society.

In many developing countries the limited availability of service is constraining economic growth. Apart from the telecommunication infrastructure deployment it is highly important to equip the back-office activities through ITC in a manner that can highly assist the core telecommunication activities, and implementation of modern information and management technologies guarantees a successful improvement in competitive ability. The offered solutions are in demand by the companies seeking to enhance monitoring systems and upgrade their business activities.

For companies to improve transparency of their business, they need to have up-to-date information about all operation and financial indicators, assets and resources of all departments and divisions. Actuality is very important: information for the previous quarter or month will not help in making justified decisions. Hence, the requirements for a powerful system that can quickly process large volumes of information are highly required.

ERP is an information system for company management, designed for the efficient planning and management of all company resources, as well as for the automation of all or individual key business processes. This solution enables proactive resources management for the quick adaptation of business processes to changing market conditions and allows precise evaluations of company's current state of affairs, which helps to increase the company's competitiveness across the board.

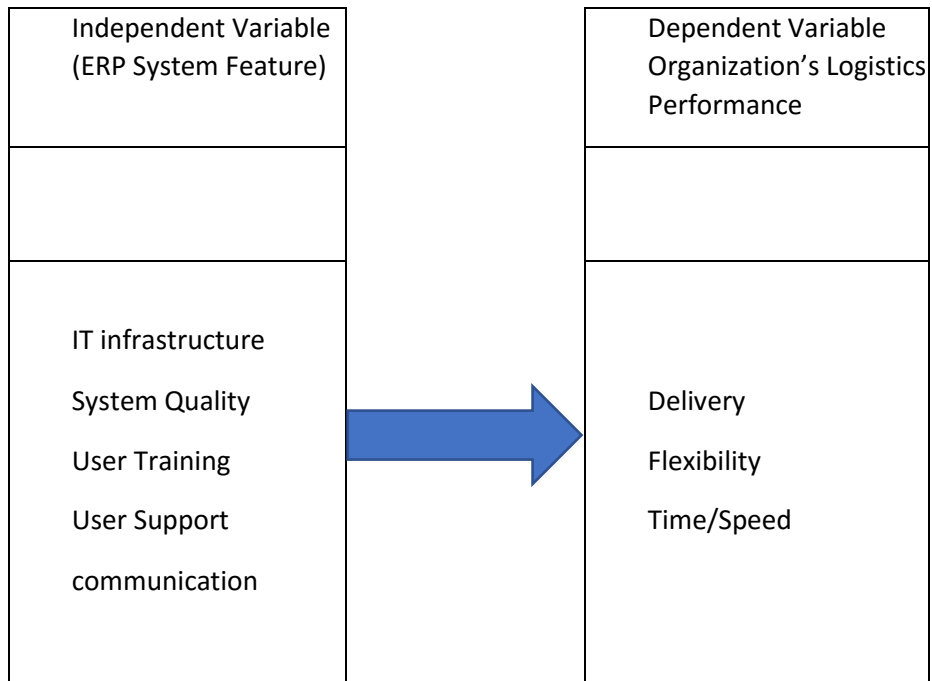
With the similar reasons mentioned above ethio telecom also introduce this system with the vision of obtaining world class telecom service provider. To be a world class telecom operator

there are many requirements set by ITU that all telecom operators across the world need to fulfill, and some of the requirements are having a well-defined business process as per the international standard named eTom and PCMM, supporting all this business process by information system mainly ERP and deploying the best quality of service for the customers in all aspects of product and services. Hence; for the fulfilling the expected requirement and to support the steady growth of the country's economic development ethio telecom implemented an integrated ERP system on December 2011 on a modular manner. And mainly the license for this system implementation has been procured from the world well known software developer named Oracle through open tender and integrated by softpro (i.e. Indian software integrator). And the major reasons that drive the company to choose for ERP are mainly related to improving company's performance and decision making, to reduce labor costs, bureaucracy and other related errors. And the other reasons are: to enhance the integration among work units and establish organizational standardization across different locations in order to have effective and efficient company' operations in all aspects.

### **2.3. Conceptual Framework**

System technology implementation has focus on the proper operation of different system IT infrastructure, system quality, user training, user support and communication have better system supported logistics activities like ERP. The strategic and better management of those activities will enable better utilization and implementation of systems to support and manage the logistics activities effectively. Having the understanding of the basic concept, the conceptual framework of the research is presented as below:

Figure 1.1: Conceptual framework



Source: Yurtkuru,2015

## CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY

Points discussed in this chapter were description of the study area, research approach, research design, population size, data sources and types, data collection procedures, ethical consideration and data analysis.

### **3.1. Description of the study area**

Ethio telecom is an integrated telecommunications solution provider operating in Ethiopia. It offers internet, data, VAS, International and Voice services. It currently provides telecom service in the entire country on both voice, internet, data channels with comprehensive plans in place to meet the requirements set out by the Ministry of Communication and Information Technology (MCIT) and peoples of Ethiopia. It has around 60 million customers. In 2015/2016 it has got revenue more than 30 billion Ethiopian birr before tax. It has Eight Regional Offices (South west and Gambella region- Jimma, Noth region-Mekele, West region and Assosa- Nekemt, South east region- Adama , East and Jijiga region-Dire Dawa, South region-Hawassa, North west region-Bahir Dar, North east and semera region -Dessie) and six zonal office in Addis Ababa ( south west A.A – sarbet, west A.A- Sebategn, east A.A- Bole, South A.A- Saris, North A.A- Sidist killo and Central A.A -Legehar). Under the nine regions and six zones there are more than 214 shops, serving residential and enterprise customers. Ethio telecom is working with the collaboration of Distributors, Hidassie Telecom and Ethiopian post office for the distribution of voucher cards and the sale of SIM cards and handsets all over the country at their distribution centers. Currently the company has more than 13000 permanent employees and thousands of contract staffs including the security people. It has a target of increasing the number of customers by many thousands and collecting total revenue around 41 billion Ethiopian birrs by the end of June,2018. / Company profile and business plan). Ethio telecom is the owner of many kinds of modern information communication technology infrastructure. One of the infrastructure is Enterprise Resource Planning /ERP/.

This research focused in assessing the effect of Enterprise Resource Planning in the logistics activities of ethio telecom. All commercial items needed for sales are moved from central warehouse to respective regional and zonal warehouse and from regional and zonal warehouse to their respective shops using ERP system. Distribution of SIM cards, Voucher cards and Handset

for Main Distributors, Hidassie Telecom and Ethiopian post office also supported only by ERP system. Each shop, Distributor, Hidassie telecom and post office send their demand to zone or region offices then the region or zone office Direct channel shop coordinators and indirect channel post coordinators can check the availability of the requested quantity in the system and raise requisition using ERP system and submit to Zone Direct or Indirect channel managers for approval. The warehouse staffs do issuing using the order numbers created by the system after the approval of the managers. Finally using the drivers, the needed commercial items will be sent to the respective users. All payments especially for permanent employees are paid using ERP system.

### **3.2. Research Approach**

The main purpose of this research was to assess the effect of ERP system in the logistics activities of ethio telecom. The researcher used quantitative research approach. The researcher collected quantitative data through questionnaires and self-observation.

### **3.3. Research Design**

As Adams et al 2007 0 described research design is the blueprint for achieving research objectives and answering research questions. Since this research assess the effect of Enterprise Resource Planning system in the logistics activities of ethio telecom the researcher used descriptive and explanatory type of research. Adams et al (2007) explain that explanatory research is describe the phenomena as well as explain why behavior is the way it is and descriptive research is used to simply describing the phenomena. Correlational studies applied to determine whether the variables under study have some kind of association or not.

### **3.4. Population of the study**

The population of this research was managers, shop supervisors and warehouse staffs of the three zonal offices in Addis Ababa, SWAAZ, EAAZ and SAAZ. The population under study was homogeneous, since all managers, supervisors and warehouse staffs were taken as a respondent there was no sampling technique.

### **3.5. Data Sources and types**

The source of data for this research was from the users of ERP system in ethio telecom. In order to achieve the objectives of this research both primary and secondary data used. The secondary data was collected from the company's work processes, policies, procedures and other documents related with the ERP practices and also from different literatures on the area. The primary data were collected through questionnaire which included open – ended and close – ended questions.

### **3.6. Data Collection Procedures**

The researcher used questionnaire, and observation to collect primary data. The questionnaires were distributed to all the population of warehouse staffs, managers and supervisors. The questionnaires were open-ended and close-ended questions. The secondary data was obtained from different sources like: - company's work processes, related literature on the area, internet and other sources. All effort has been done to reduce confusion and bias when preparing the questionnaires.

### **3.7. Ethical Consideration**

The study was conducted by respecting the organizations policy and rights. The respondent's privacy kept strictly confidential and their responses were used only for academic purpose. Furthermore, the entire research participants were participated on voluntary and also treated with respect. All the materials and sources that used in this study were properly cited.

### **3.8. Methods of Data Analysis**

The data was collected, verification was conducted and complete questionnaires were identified. Then the data is coded in to SPSS (statistical package for social science) according to the variables selected and the questions asked. The data analysis was performed using descriptive and inferential statistics. PSS statistics (statistical Package for social scientists) software version 20 was used to process the data.

### 3.8.1 Descriptive statistical Analysis

The final report of the relevant demographic variables was produced through central tendency measurements (frequency and frequency distribution, valid & cumulative percentage and comparison of mean). In addition, tabular explanations are used to present the result with the help of SPSS.

### 3.8.2. Inferential statistical Analysis

In inferential statistical analysis, correlation and multiple linear regression methods were utilized using statistical package for social sciences (SPSS) software. The use of these statistical tools and methods of presentation are described below

#### a) correlation

Correlation (r) is used to describe the strength and direction of relationship between two variables. Since all variables are measured as an interval level, Pearson product moment correlation was used. Correlation “r” output always lies between -1.0 and +1.0 and if “r” is positive, there exists a positive relationship between the variables. If it's negative, the relationship between the variables is negative. While computing a correlation, the significance level shall be set at 95% with alpha value of 0.05 or a chance of occurrence of odd correlation is 5 out of 100 observations.

#### b) Multiple Regression Analysis

Multiple regression analysis is a major statistical tool for predicting the unknown value of a variable from the known value of variables. And it is about finding a relationship between variables and forming a model. The Model for this study was developed using eight ERP implementation factors or predictors which have influences on internal supply chain performance.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_n X_n + \varepsilon$$

Where Y is the dependent variable and the independent variables are those which explain the response ranges from X1 to X5.

Table 1: Model Specification of Variables.

S.No	Predictor Variable (X)	Beta Coefficient ( $\beta$ )	Predictor X-Value Assigned
1	IT Infrastructure	$\beta_1$	X1
2	System Quality	B2	X2
3	User Training	B3	X3
4	User Support	B4	X4
5	Communication	B5	X5
6	Organization's Logistics Performance	Constant	Y

Source: SPSS output of the survey, 2018

### 3.9. Measurement Instruments

The employed questionnaire contains the general information of the respondents and Likert scale measurements of the variables. The general information includes gender, age, educational level, job position in the company, unit of work and years of company experience.

Five-point Likert scale was used to rate the independent and dependent variables, which ranges from Strongly-disagree (1) to Strongly-agree (5) level of agreement. These five-point Likert scale are adapted from different literatures of scholars. The independent variables of the effect of ERP system in the logistics activities factors of ERP system measurement questions and the dependent variable the organization's logistics performance measurement questions were adopted by myself after referring different sources.

### 3.10. Validity and Reliability Test

#### 3.10.1 Validity Test

The scientific soundness of a research finding is determined by the validity of the instruments used. All possible efforts were exerted to make the data collection instruments easily understandable by the respondents so that the intended information can be collected thereby

increasing trustworthiness of the ultimate findings. After the questionnaire was constructed, pre-testing was done with individuals who have knowledge of the area by allowing them to read and comment on it. Constructive comments were collected from the individuals and the questionnaire was adjusted accordingly. Then, validation of the instrument was given by academic advisor prior to the data collection.

### **3.10.2 Reliability Test**

Reliability is essentially the dependability of an instrument to test what it was designed to test. The appropriate test for reliability is inter-item consistency reliability which is popularly known as the Cronbach's coefficient alpha.

According to Joseph and Rosemary (2003), Cronbach's alpha reliability coefficient ( $\alpha$ ) normally ranges between 0 and 1. According to these authors, there is a greater internal consistency of the items if the Cronbach's alpha coefficient closes to 1.0.

Based on the following rule of thumb of (George and Mallery, 2003, p. 231), if " $\alpha > 0.9$  – 'Excellent',  $\alpha > 0.8$  – 'Good',  $\alpha > 0.7$  – 'Acceptable',  $\alpha > 0.6$  – 'Questionable',  $\alpha > 0.5$  – 'Poor', and  $\alpha < 0.5$  – 'Unacceptable'."

Table 3.2 below shows that there is "acceptable" and "good" internal consistency of each independent variable's parameters used. And the study has the sum of the independent variables average Cronbach's alpha value of ( $\alpha = 0.904$ ) and the reliability test of the study is located on "excellent" range.

*Table 2 :Reliability Test of Variable's Using Cronbach's Alpha*

No.	Variable Name	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	Number of Items	(a) Reliability Range
1	IT Infrastructure	.776	.776	5	Acceptable
2	System Quality	.821	.820	7	Good
3	User Training	.719	.722	5	Acceptable
4	User Support	.696	.698	4	Acceptable
5	Communication	.728	.727	6	Acceptable
6	All Together	.934	.934	27	Excellent

Source: SPSS output of the survey, 2018

## CHAPTER FOUR: DATA ANALYSIS AND DISCUSSION

### 4.1 Introduction

The data analysis and discussion were carried out based on the data collected through questionnaire, as well as observation from managers, Supervisors and warehouse staffs who are Mainly involved in the logistics activities of the company using ERP system. Therefore, as determined in the data collection tool of this study, data were collected using questionnaire, and observation methods. Accordingly, the collected data were analyzed quantitatively. Particularly, statistical tools like: percentage, frequency, mean and standard deviation were employed. The survey was conducted during three weeks' time and a total 117 questionnaires were effectively used for analysis that shows response rate 96.6%.

As inferred in the preceding part of this study, the target population of this study comprised of 121 employees and individuals who are working closely in the logistics activities of the company using ERP system. However, from the total 121 questionnaire distributed 117 were returned from which 5 were not returned. 117 respondents have filled and returned the questionnaire, which essentially made the response rate about 96.6%. This is a very good response rate based on Fowler (2002) a 75% response rate is considered adequate.

The data collected using questioner was analyzed and presented based on the objectives of the study. The data was found to be important to explain the effect of ERP of Enterprise Resource Planning in the logistics activities of ethio telecom. Descriptive and Correlational statistics were used to analyze and interpret the results of the study.

The descriptive analysis consists of central tendency measurements (frequency and frequency distribution, percentage, valid & cumulative percentages). In addition, tabular explanations are used with the help of SPSS. Correlation analysis with the help of statistical package for social sciences (SPSS V-20) software were also used to present the findings of the study.

The data collected using five-point Likert scale which is non-parametric in nature was converted in to parametric one by computing the sum and taking the average of each variable. Hence it is possible to conduct Pearson correlation (Creech, 2011).

Pearson correlation ( $r$ ) is used to describe the strength and direction of relationship between the dependent variable which is Delivery and the Five independent variables.

The demographic information of the respondents who have filled and returned the questionnaire is presented on underneath.

*Table 3 Characteristics of the respondents*

S. N	Variables	Type	Count	%
2	Over all Response Rate	Number of Questionnaires Distributed	121	100
		Returned Questionnaires	117	96.7
		Not Returned Questionnaires	4	3.3
		Total		
1	Gender	Male	101	86.3
		Female	16	13.7
Total			117	100
2	Age (in years)	25 and <25	0	0
		26-35	35	29.9
		36-40	59	50.4
		41 and more	23	19.7
Total			117	100
3	Service years of the Respondents	6-10	19	16.2
		11-15	45	38.5
		16-20	42	35.9
		21 and above	11	9.4
Total			117	100

<b>S. N</b>	<b>Variables</b>	<b>Type</b>	<b>Count</b>	<b>%</b>
4	Education qualification	Diploma	3	2.6
		BA/BSC	108	92.3
		Master and above	6	5.1
Total			117	100
4	Work unit of the Respondents	Direct Channel sales	35	29.9
		Enterprise Sales	3	2.6
		Finance	6	5.1
		Fixed Access Network	23	19.7
		Human Resource	3	2.6
		Indirect Channel Sales	6	5.1
		Legal	3	2.6
		Operation and Maintenance	12	10.3
		Security	3	2.6
		Sourcing and Facility	23	19.7
Total			117	100
2	Job Position of the respondents	Staff	11	9.4
		Supervisor	85	72.6
		Manager	21	18.0
Total			117	100

Source: SPPS output of the survey, 2018

### 4.1.1 Gender of the respondents

As shown in table 4.1 above, out of 117 respondents, 86.3% of them were male and the remaining 13.7% % were female respondents.

### 4.1.2 Age of the Respondents

As depicted on the above table 4.1, males dominate the respondents' list registering about 86.3% of the total respondent with females taking the remaining 13.7% of the respondents. As far as respondents' age is concerned, the majority of the respondents 50.4% were aged between 36 to 40 years followed by the age categories of 26 to 35 years, and 41 and above years respectively with percentage scores of 29.9%, and 19.7% in that order.

### 4.1.3. Education Level of the Respondents

Table 4.1 shows that few respondents (2.6%) have educational level of Diploma while the majority of the respondents (92.3%) have acquired their first degree. 5.1% of the respondents have second degree from the total sample. Based on their educational status, it can be said that the respondents have the ability to understand the language of ERP system.

### 4.1.4 Company Experience of the Respondents

As it can be seen from table 4.1 all of the respondents have experience of 6 years and above. 16.2% of the respondents have worked 6 to 10 years in Ethio telecom while 38.5% of the respondents have served the company from 11 to 15 years. 35.9% of the respondents served the company 16 to 20 years and 9.4% served the company more than 21 years.

### 4.1.5 Work Unit of the Respondents

As it is already explained in the research design and methodology part, the researcher has focused on the All divisions considering ERP system for the logistics activities of the company. Accordingly, out of the 117 employees who returned the questionnaire, 29.9% of the respondents belong to Direct Channel Sales Division, 19.7% belong to Sourcing and Facility Division, 19.7% belong to Fixed Access Network Division , 10.3% belong to Operation and Maintenance Division, 5.1% belong to Finance Division, 5.1% belong to Indirect Channel Sales

Division, 2.6% belong to Enterprise Sales Division, 2.6% belong to Legal Division and the remaining 2.6% of the respondents were from Security division.

#### 4.1.6 Position of the Respondents

As it can be seen from the table 4.1 above majority of the respondents (72.6%) are Supervisors, 17.9% are Managers from Different Divisions and 9.4% are staffs. The researcher has taken only Warehouse staffs under the three zone offices in Addis Ababa.

## 4.2. Result of Survey data

In this part, the data collected using Likert scale is presented for both the independent and dependent variables.

*Table 4 Summary of Survey result for Independent variables*

No	IT (Information Technology) Infrastructure		Level of Agreement					Total	Mean
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
1	The company has availed computer for all users of ERP System	Count	0	42	27	31	17	117	3.20
		%	0	35.9	23.1	26.1	14.5	100	
2	There is reliable intranet connection to use ERP system for logistics activities	Count							2.73
		%	15.4	36.8	17.1	21.4	9.4	100	
3	System interruptions are fixed instantly without affecting logistics activities	Count							2.85
		%	13.7	31.7	17.9	29.1	7.7	100	
4	It is possible to get instant support from system administrators when problem occurs in using ERP system	Count							2.97
		%	0	40.2	31.6	19.7	8.5	100	
5	The level of IT usage is very high within the company	Count							3.08
		%	0	37.6	27.4	24.8	10.3	100	

Source: SPSS output of the survey,2018

For the question which asked employees about the company availed computers for all users of ERP system, 41% of the respondents replied that the company availed computers for all users of the ERP system, especially on warehouse staffs, supervisory and managerial levels. On the contrary, 35.9% of the respondents believed that the company didn't availed computers for all users of ERP system. The remaining 23.1% of the respondents are neither of the two sides. From this fact, we can deduce that majority of the respondents believe that the company availed computers for users of ERP system in the three zone offices.

Concerning the existence of reliable intranet connection to use ERP system for the logistics activities of the company, 52.2% of the respondents respond that there is no reliable intranet connection to do logistics activities on the system. This results the delay of logistics activities in the three zone offices. On the other hand, 30.8% of the respondents have agreed that there is reliable intranet connection to use ERP system for the logistics activities of the zonal offices. The rest 17.1% of the respondents they neither agree nor disagree. From this interpretation we can comprehend that most of the respondents agreed that they are not doing their tasks On ERP system as expected due to not having reliable intranet connection.

Regarding system interruptions are fixed instantly without affecting logistics activities, 52.2% of the respondents replied that system interruptions are not fixed instantly without affecting logistics activities. 36.8% of the respondents agreed that there is instantly fixed system interruption without affecting logistics activities. The remaining 17.9% of the respondents are neither agree nor disagree. As a result, it is possible to say system interruptions are not fixed instantly without affecting logistics activities of the company.

For the question asked about It is possible to get instant support from system administrators when problem occurs in using ERP system, 40.2% the respondents answered they are not getting instant support from the system administrators when problem occurs in using ERP system. Whereas 28.2% of the respondents replied that they are getting instant support from the system administrator whenever problem occurs in using ERP system. The other 31.6 % of the respondents declared that they neither agreed nor disagree about the support given from system administrator when problem occurs in using ERP system. We can infer that there is no enough instant support from system administrators when problem occurs in using ERP system.

Related with the level of IT usage is very high with in the company,37.6% of the respondents replied that the level of IT usage in not very high with in the company, On the other hand 35.1% of the respondents agreed that the level of IT usage is high with in the company. The remaining 27.4% of the respondents neither agree nor disagree about the level of IT usage in the company. Depending on the percentage of the respondents we can conclude that the level of IT usage in the company is not that much high.

*Table 5 Summery of Survey result for Independent variables*

No	System Quality		Level of Agreement					Total	Mean
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
1	ERP system of ethio telecom is always ready and running as necessary (always working)	Co unt	16	37	21	34	9	117	2.18
		%	31.6	31.6	23.9	12.8	0	100	
2	ERP system of ethio telecom responds quickly enough (Fast Response)	Co unt	37	37	28	15	0	117	2.40
		%	27.4	25.6	26.5	20.5	0	100	
3	ERP system of ethio telecom requires only the minimum number of fields and screen to do a task	Co unt	32	30	31	24	0	117	2.43
		%	19.7	34.2	29.9	16.2	0	100	
4	All data with in ERP system of ethio telecom are fully integrated and consistent	Co unt	25	41	32	19	0	117	2.38
		%	21.4	35.0	27.4	16.2	0	100	
5	Users can work on the ERP system without any challenge in ethio telecom	Co unt	25	39	33	20	0	117	2.41
		%	21.4	33.3	28.2	17.1	0	100	
6	The capacity of the ERP system is enough for all employees to do the task at the same time.	Co unt	28	44	33	12	0	117	2.25
		%	23.9	37.6	28.2	10.3	0	100	
7	Users can work on the ERP system without any challenge in ethio telecom	Co unt	26	40	36	15	0	117	2.34
		%	22.2	34.2	30.8	12.8	0	100	

Source: SPSS output of the survey,2018

For the question ERP system of ethio telecom is always ready and running as necessary (always working) ,63.2% of the respondents replied that the ERP system adopted by ethio telecom is not always ready to run as necessary or not always working due to many different reasons. On the contrary, 12.8 % of the respondents believed that ERP system is always ready to run. The remaining 23.9% of the respondents are neither of the two sides. From this fact, we can deduce that majority of the respondents agreed the ERP system of the company is not always ready to run.

Regarding ERP system of ethio telecom responds quickly enough (Fast Response), 53% of the respondents replied that the ERP system of ethio telecom is not responds quickly enough. 20.5% of the respondents agreed that the system responds quickly enough. The remaining 26.5% of the respondents are neither agree nor disagree. As a result, it is possible to say the ERP system of ethio telecom not responds quickly enough.

For the question asked about ERP system of ethio telecom requires only the minimum number of fields and screen to do a task, 53.9% of the respondents answered the ERP system of ethio telecom does not require only the minimum number of fields and screen to do a task. Whereas 16.2% % of the respondents replied the ERP system of ethio telecom require only the minimum number of fields and screen to do a task. The other 29.9% of the respondents declared that they neither agreed nor disagree. We can infer that the system of the company does not have minimum number of fields and screen to do a task on the system.

Related with All data with in ERP system of ethio telecom are fully integrated and consistent, 56.4% of the respondents replied that the ERP system of the company does not fully integrated and consistent, On the other hand 16.2% of the respondents agreed that the ERP system of the company are fully integrated and consistent. The remaining 27.4% of the respondents neither agree nor disagree. Depending on the percentage of the respondents we can conclude that the ERP system of ethio telecom does not fully integrated and consistent.

Concerning Users can work on the ERP system without any challenge in ethio telecom, 54%% of the respondents respond that the users can work on the ERP system with many challenges. On the other hand, 17.1% of the respondents agreed that they are doing their tasks on ERP system without challenges the rest 28.2% of the respondents they neither agree nor disagree.

From this interpretation we can comprehend that users are working on the ERP system with challenges.

Regarding The capacity of the ERP system is enough for all employees to do the task at the same time, 61.5% of the respondents replied that the capacity of the ERP system is not enough for all employees to do tasks at the same time. On the contrary 10.3% of the respondents agreed that the ERP system is enough for all employees to do the task at the same time. The rest 28.2% of the respondents are neither agree nor disagree. As a result, it is possible to say the ERP system of ethio telecom not have enough capacity to do the task for all employees at the same time. .

For the question asked about There is no delay of logistics activities using ERP system in ethio telecom, 56.4% of the respondents answered there is delay of logistics activities using ERP system due to obstacles. On the other hand, 12.8% of the respondents agreed that there is no delay of logistics activities using the existing ERP system of ethio telecom. The rest 30.8% the respondents declared that they neither agreed nor disagree. We can infer that due to the capacity of the existing ERP system of ethio telecom there is delay of logistics activities.

Table 6 Summary of Survey result for Independent variables

No	User Training		Level of Agreement					Total	Mean
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
1	Training was given exhaustively for all users of ERP system in ethio telecom	Co unt	16	30	30	31	10	117	2.91
		%	13.7	25.6	25.6	26.5	8.5	100	
2	There was a gap between the imparted training and ethio telecom business requirements	Co unt	0	39	34	33	11	117	3.14
		%	0	33.3	29.1	28.3	9.4	100	
3	The training programs were properly and well designed for end-users	Co unt	18	36	37	26	0	117	2.61
		%	15.4	30.8	31.6	22.2	0	100	
4	Internal staff has been intensively trained on the system	Co unt	25	41	23	28	0	117	2.46
		%	21.4	35.0	19.7	23.9	0	100	
5	You are well trained how Receiving goods through the ERP system and Moving goods from one points of sales to another.	Co unt	34	29	25	29	0	117	2.42
		%	29.1	24.8	21.4	24.8	0	100	

Source: SPSS output of the survey,2018

For the question which asked employees about Training was given exhaustively for all users of ERP system ,39.3% of the respondents replied that training was not given exhaustively for all users of ERP system. On the contrary, 35.0% of the respondents agreed that training was given exhaustively for ERP system end users. The remaining 25.6% of the respondents are neither of the two sides. From this fact, we can deduce that training was not given exhaustively for all users of ERP system.

For the question asked about There was a gap between the imparted training and ethio telecom business requirements 62.4% of the respondents answered there is a gap between imparted training and ethio telecom business requirements. Whereas 9.4% of the respondents replied that there is a no gap between imparted training and ethio business requirements. The other 28.2% of the respondents declared that they neither agreed nor disagree. We can infer that there is a gap between imparted training and ethio business requirements.

Concerning the question asked about the training programs were properly and well designed for end-users,46.2% of the respondents agreed that the training programs were not designed for properly for end-users. On the other hand,22.2% of the respondents replied that the training programs were properly well designed for end-users. The rest 31.6% of the respondents are neither of the two sides. From this fact, we can deduce that the training programs were not properly well designed for end users.

Related with Internal staff have been intensively trained on the system, 56.4% of the respondents replied that the internal staffs have not been intensively trained on the system, On the other hand 23.9% of the respondents agreed that internal staffs have been trained. The remaining 19.7% of the respondents neither agree nor disagree. Depending on the percentage of the respondents we can conclude that the internal staffs have not been trained on the system very well.

For the question You are well trained how Receiving goods through the ERP system and Moving goods from one points of sales to another, 53.9 % of the respondents replied that they are not well trained how receiving goods through the ERP system and moving goods from one point of sales to another. Only 24.8%of the respondents replied that they are well trained how receiving goods through the ERP system and moving goods from one points of sales to another. The rest 21.4% of the respondents are neither of the two sides. From this fact, we can deduce that majority of the respondents agreed that they are not well trained in receiving and moving goods from one point of sales to another.

Table 7 Summery of Survey result for Independent variables

No	User Support		Level of Agreement					Total	Mean
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
1	<i>Back office technical staffs give immediate support to users when problem occurred in the system</i>	Co unt	32	30	34	21	0	117	2.38
		%	27.4	25.6	29.1	17.9	0	100	
2	<i>The ERP help desk has been well established for providing efficient end-user support</i>	Co unt	29	34	28	26	0	117	2.44
		%	24.8	29.1	23.9	22.2	0	100	
3	<i>Ethio professionals are capable enough to support any system related queries</i>	Co unt	24	40	35	18	0	117	2.40
		%	20.8	34.2	29.9	15.4	0	100	
4	<i>Complicated System support is dependent of the vendor</i>	Co unt	22	33	33	29	0	117	2.59
		%	18.8	28.2	28.2	24.8	0	100	

Source: SPSS output of the survey,2018

For the question which asked employees about *Back office technical staffs give immediate support to users when problem occurred in the system* ,53% of the respondents replied that No technical support is given immediately from back office when problem occurred in the system. On the contrary, 17.9% of the respondents agreed that back office staffs give immediate support when there is problem. The remaining 29.1% of the respondents are neither of the two sides. From this fact, we can deduce that back office technical staffs are not giving immediate support when problem is occurred in the ERP system.

Regarding question which asked employees about *The ERP help desk has been well established for providing efficient end-user support* ,53% of the respondents replied that the ERP help desk has not been well established for providing efficient end-user support. On the contrary, 22.2% of the respondents agreed that the ERP help desk has been well established for providing

efficient end-user support. The remaining 29.1% of the respondents are neither of the two sides. From this fact, we can conclude that the ERP help desk has not been well established for providing efficient end-user support.

For the question asked *Ethio professionals are capable enough to support any system related queries*, 54.7% of the respondents respond that ethio professionals are not capable to support any system related queries. On the other hand, 15.4% of the respondents have agreed that ethio professionals are capable to support any system related queries. The rest 29.9% of the respondents they neither agree nor disagree. From this interpretation we can comprehend that it is difficult to say ethio professionals are capable enough to support any system related queries,

Concerning Complicated System support is dependent of the vendor *support*, 47.0% of the respondents respond that complicated system support is not dependent on the vendor. On the other hand, 24.8% of the respondents have agreed that complicated system support is dependent on the vendor. The rest 28.2 % of the respondents they neither agree nor disagree. From this interpretation we can comprehend that it is difficult to say complicated system support is dependent on the vendor regarding the logistics activities of using the ERP system.

Table 8 Summery of Survey result for Independent variables

No	Communication		Level of Agreement					Total	Mean
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
1	Employees are aware about the resources the company has been allocated in ERP system	Co unt	23	32	33	29	0	117	2.58
		%	19.7	27.4	28.2	24.8	0	100	
2	Effective communication spreads the aims of ERP system to all administration of the firm	Co unt	14	32	41	30	0	117	2.74
		%	12.0	27.4	35.0	25.6	0	100	
3	Employees are aware about the importance of the system for the	Co unt	26	35	34	32	0	117	2.44
		%	22.2	29.9	29.1	18.8	0	100	
4	The goals and objectives for using ERP system is clear among the top and middle management	Co unt	17	36	35	29	0	117	2.65
		%	14.5	30.8	29.9	24.8	0	100	
5	The ERP system of the company provides important information	Co unt	25	39	29	24	0	117	3.44
		%	21.4	33.3	24.8	20.5	0	100	
6	Thereis accountability mechanism that monitor performance	Co unt	15	28	45	25	0	117	2.68
		%	12.8	27.4	38.5	21.4	0	100	

Source: SPSS output of the survey,2018

For the question which asked employees about Employees are aware about the resources the company has been allocated in ERP system ,47% of the respondents replied that employees are not aware about the resources the company has been allocated in ERP system. On the contrary, 24.8% of the respondents agreed that employees are aware about the resources allocated by the company on ERP system. The remaining 28.2% of the respondents are neither of the two sides. From this fact, we can deduce that employees are not aware about resources the company has been allocated in ERP system.

Concerning Effective communication spreads the aims of ERP system to all administration of the firm, 39.4% of the respondents respond that effective communication not spreads the aims of ERP system to all administration of the firm. On the other hand, 25.6 % of the respondents agreed that effective communication spreads the aims of ERP system to all administration of the firm. The rest,35.0% of the respondents they neither agree nor disagree. From this interpretation we can comprehend that effective communication is not spreads the aims of ERP system to all administration of the firm.

For the question asked about Employees are aware about the importance of the system for the company, 52.1% of the respondents answered employees are not aware about the importance of the ERP system. Whereas 53.0% of the respondents replied that employees are not aware about the importance of the system. On the other hand, 18.8% of the respondents answered that employees are aware about the importance of the system. The rest 29.1% of the respondents declared that they neither agreed nor disagree. We can infer that employees are not aware of the importance of the system for the company.

Related The goals and objectives for using ERP system is clear among the top and middle management, 45% of the respondents replied that the goals and objectives of using ERP system is not clear specially among the top and middle managements. On the other hand, 24.8% of the respondents agreed that the goals and objectives for using ERP system is clear among the top and middle management. The rest 29.9% of the respondents declared that they neither agreed nor disagree. From the percentages of the respondents we can say that the goals and objectives of using ERP system is not clear among the top and middle management.

For the question the ERP system of the company provides important information,54.7% of the respondents replied the ERP system of the company not provide important information. On the other hand ,20.5% of the respondents agreed that the ERP system of the company provides important information. The rest 24.8% of the respondents they are neither agreed or disagree on this issue. It is possible to say that the ERP system of the company does not provide important information.

For the question There are accountability mechanisms that monitor performance and provide system members with useful, ongoing feedback, 40.2% of the respondents replied that there is no accountability mechanisms that monitor performance and provide system members with useful, ongoing feedback. On the contrary 21.4% of the respondents answered there is accountability mechanisms. The remaining 38.5% of the respondents are neither of the two sides. From this fact, we can deduce that it is difficult to say there is full accountability mechanisms that monitor performance and system members with useful, ongoing feedback.

The detailed survey result from respondents and the mean value of each independent variable is shown below in table 4.7.

*Table 9 Mean value of independent variable*

<b>Descriptive Statistics</b>			
	Mean	Std. Deviation	N
performance	2.6246	.69717	117
Information Technology	2.9641	.80370	117
System Quality	2.3419	.69682	117
User Training	2.7060	.74490	117
User Support	2.4509	.76158	117
Communication	2.7578	.66107	117

Source: SPSS output of the survey,2018

Based on the mean comparison of the independent variables shown in table 4.7, it can be seen that IT Infrastructure is ranked first followed by Communication, User Training, User support and System Quality.

Table 10 Summary of Survey result for Dependent variables

	Delivery		Level of Agreement					Total	Mean
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
1	The time between Order receipt from user department and materials delivery using the system is at reasonable time	Count	0	42	27	31	17	117	3.2
		%	0	35.9	23.1	26.5	14.5	100	
2	The Ability of ethio telecom is high to meet key Customers need by providing their need on time	Count	18	43	20	25	11	117	2.73
		%	15.4	36.8	17.1	21.4	9.4	100	
3	The ability of ethio telecom to notify of delivery delay or product shortage due to system problem is high.	Count	16	37	21	34	9	117	2.85
		%	13.7	31.6	17.9	29.1	7.7	100	
4	The ability of ethio telecom to modify order size or volume during logistics operation using ERP system is high.	Count	0	47	37	23	10	117	2.97
		%	0	40.2	31.6	19.7	8.5	100	

Source: SPSS output of the survey,2018

For the question which asked employees about the time between Order receipt from user department and materials delivery using the system is at reasonable time 35.9% of the respondents replied that they are not believe delivery is made at reasonable time. On the contrary, 41 % of the respondents agreed that delivery is made at reasonable time. The remaining 23.1% of the respondents are neither of the two sides. From this fact, we can deduce that the company should do more and more to deliver materials at reasonable time as much as possible.

For the question which asked employees about the Ability of ethio telecom is high to meet key Customers need by providing their need on time, 52.2% of the respondents replied that they are not agree on this issue. On the contrary, 30.8 % of the respondents agreed that the company ability to meet key customers need by providing their need on time. The remaining 17.1 % of the respondents are neither of the two sides. From this fact, we can deduce that the company should improve its ability to meet key customers need by providing their need on time.

Concerning the ability of ethio telecom to notify of delivery delay or product shortage due to system problem is high, 45.3% of the respondents respond that notification of delivery delay or product shortage due to system problem by the company is not high. 36.8 % of the respondents agreed that on this issue. The rest, 17.9 % of the respondents they neither agree nor disagree. From this interpretation we can comprehend that effective notification should be done by the company if there is delivery delay or product shortage due to system problem.

Related The ability of ethio telecom to modify order size or volume during logistics operation using ERP system is high., 40.2% of the respondents replied that the ability of ethio telecom is not high to modify order size or volume during logistics operation using ERP system. On the other hand, 28.2% of the respondents agreed that the ability of the company is high on this issue. The rest 31.6 % of the respondents declared that they neither agreed nor disagree. From the percentages of the respondents we can say that the company should do more to modify order size or volume during logistics operation using ERP system as needed.

Table 11 Summary of Survey result for Dependent variables

No	Flexibility		Level of Agreement					Total	Mean
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
1	Ethio telecom has the ability to respond to changes in the volume and types of material to be moved to points of sales using ERP system	Count	0	44	32	29	12	117	3.08
		%	0	37.6	27.4	24.8	10.3	100	
2	The company possesses the ability to respond rapidly to changes in the logistics activities work environment.	Count	37	37	28	15	0	117	2.18
		%	31.6	31.6	23.9	12.8	0	100	
3	Ethio telecom choses other alternatives to deliver materials to point of sales when there is intermate interruption occurred.	Count	32	30	31	24	0	117	2.40
		%	27.4	25.6	26.5	20.5	0	100	
4	Ethio telecom is characterized by openness to get new ideas and methods to facilitate its logistics activities	Count	23	40	35	19	0	117	2.43
		%	19.7	34.2	29.9	16.2	0	100	

Source: SPSS output of survey,2018

For the question which asked employees about Ethio telecom has the ability to respond to changes in the volume and types of material to be moved to point of sales using ERP system ,37.6 % of the respondents replied that they do not believe the company is doing properly to respond to changes in volume and types of materials when they are moved to point of sales. On the contrary, 35.1 % of the respondents agreed on this issue. The remaining 27.4 % of the respondents are neither of the two sides. From this fact, we can deduce that the company should do more and more to respond to changed whenever they occurred in the logistics operation of the company.

For the question which asked employees about the company possesses the ability to respond rapidly to changes in the logistics activities of work environment., 63.2 % of the respondents

replied that they are not agree on this issue. On the contrary, 12 % of the respondents agreed that the company ability has good ability to respond rapidly to changes in the logistics activities of work environment. The remaining 23.9 % of the respondents are neither of the two sides. From this fact, we can deduce that the company should try to have good management of rapidly respond to changes in its logistics operations work environment.

Concerning ethio telecom choses other alternatives to deliver materials to point of sales when there is internet interruption occurred, 53.0 % of the respondents do not agree on this issue. 20.5 % of the respondents agreed that the company choses other alternatives to deliver material to point of sales when there is intermate interruption occurred. The rest, 26.5% of the respondents they neither agree nor disagree. From this interpretation we can comprehend that the company must uses other alternatives to deliver materials when there is internet interruption.

Related to ethio telecom is characterized by openness to get new ideas and methods to facilitate its logistics activities, 53.9 % of the respondents replied that there is no openness to get new ideas and methods to facilitate its logistics activities. On the other hand, 16.2 % of the respondents agreed on this issue. The rest 29.9 % of the respondents declared that they neither agreed nor disagree. From the percentages of the respondents we can say that the company should do more to have new ideas and methods to facilitate its logistics activities.

Table 12 Summery of Survey result for Dependent variables

No	Time/Speed		Level of Agreement					Total	Mean
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
1	Ethio telecom is committed to provide fast logistics services to its customers.	Co unt	25	41	32	19	0	117	
		%	21.4	35.0	27.4	16.2	0	100	
2	The company is committed to deliver orders to customers within the agreed delivery times.	Co unt	25	39	33	20	0	117	
		%	21.4	33.3	28.2	17.1	0	100	
3	Ethio telecom is characterized by quick exchange of information with stakeholders for its logistics activities.	Co unt	28	44	33	12	0	117	
		%	23.9	37.6	28.2	10.3	0	100	
4	The company is committed to maintain its ERP system quickly when problems are occurred.	Co unt	26	40	36	15	0	117	
		%	22.2	34.2	30.9	12.8	0	100	
5	Ethio telecom is characterized by having quick system support for users from its ERP help desk	Co unt	16	30	30	31	10	117	
		%	13.7	25.6	25.6	26.5	8.5	100	

Source: SPSS output of survey,2018

For the question which asked employees about ethio telecom is committed to provide fast logistics services to its customers, 56.4% of the respondents replied that the company do not provide fast logistics services to its customers. On the Other hand, 16.2% of the respondents agreed that there is fast logistics services by the company to its customers. The remaining 23.4 % of the respondents are neither of the two sides. From this fact, we can deduce that the company should do more and more to have fast logistics services to its customers.

Concerning The company is committed to deliver orders to customers within the agreed delivery time, 54.7% of the respondents respond that the company is not committed to deliver orders to customers within the agreed delivery time. On the other hand, 17.1 % of the

respondents have agreed that the company is committed to deliver orders to customers within the agreed delivery time. The rest 28.2% of the respondents they neither agree nor disagree. From this interpretation we can comprehend that the company should increase its commitment to deliver orders to customers within the agreed delivery time.

Regarding ethio telecom is characterized by quick exchange of information with stakeholders for its logistics activities, 61.5% of the respondents replied that ethio telecom is not characterized by quick exchange of information with stakeholders for its logistics activities. On the contrary, 10.3 % of the respondent have agreed that the company is characterized by quick exchange of information with stakeholders for its logistics activities. The remaining 28.2% of the respondents are neither agree nor disagree. As a result, it is possible to say that the company should exchange information quickly with its stakeholders in order to have smooth logistics operations.

Related with the company is committed to maintain its ERP system quickly when problems are occurred.,56.4 % of the respondents agreed that there is no quick ERP system maintenance when problems occurred by ethio telecom. On the other hand, 12.8% of the respondents agreed that there is quick ERP system maintenance within the company. The remaining 30.9% of the respondents neither agree nor disagree. Depending on the percentage of the respondents we can conclude that the company should have especial professionals who can maintain the system whenever there is interruption.

Concerning ethio telecom is characterized by having quick system support for users from its ERP help desk, 39.3 % of the respondents do not agree on this issue. 35.0 % of the respondents agreed that the company has quick system support for users from its ERP help desk. The rest, 25.6% of the respondents they neither agree nor disagree. From this interpretation we can comprehend that the company should have well organized ERP help desk to give quick support whenever needed by the user of ERP system

Additional question was placed at the last part of the questionnaire for the respondents to get additional points if they have to say about the ERP system effect in the logistics activities of the company, but the researcher has got only few respondents from Direct Channel Sales, Indirect Channel Sales and Warehouse staffs and their response summarized as below: -

- There is no integration between the ERP system of the company with the existing commercial system named CRM. As a result, it is difficult to know the correct number of items on hand in the ERP system.
- No periodic review and discussion among the ERP support section and the employees who are working on the system. Due to this the concerned section lacks to get feedback about the functionality of the system as it expected.
- Frequent interruption of the ERP system and its server capacity limitation highly affects the logistics activities of the company
- Mass Training related to ERP system in the class room for employees who are working on the system is not comfortable to them. As a result, most supervisors are not able to move commercial items from one point of sales to another if needed. They proposed on job training is by far good to transfer knowledge and skills.
- Finally, lack of expertise on the system from the company side is still a challenge for the system Utilization.

### **4.3 Correlation Analysis**

Correlation shows the strength and direction of relationship between variables. The linear relationship between variables can be measured by correlation coefficient ( $r$ ), which is commonly called *Pearson product moment correlation*. Person's "r" mainly measures the data from the interval or ratio level and used to measure based on the deviation from the mean (Yabebal, 2017). Table 4.11 shows the measures of association and descriptive adjectives between the predictor variables.

*Table 13 Measures of Associations and Descriptive Adjectives*

Measure of Association	Descriptive Adjective
> 0.00 to 0.20; < -0.00 to – 0.20	Very weak or very low
> 0.20 to 0.40; < -0.20 to – 0.40	Weak or low
> 0.40 to 0.60; < -0.40 to – 0.60	Moderate
> 0.60 to 0.80; < -0.60 to – 0.80	Strong or high
> 0.80 to 1.0; < -0.80 to – 1.0	Very high or very strong

Source: (*MacEachron, 1982*)

Hence, the correlation output of the dependent and independent variables is interpreted based on table 4.12.

Table 14 Correlation Matrix between the dependent and the Independent Variables

		Correlations					
		IT Infrastructure	System Quality	User Training	User support	Communication	Performance
IT Infrastructure	Pearson Correlation	1	.778**	.753**	.708**	.655**	.926**
	Sig. (2-tailed)		0	0	0	0	0
	N	117	117	117	117	117	117
System Quality	Pearson Correlation	.778**	1	.759**	.739**	.671**	.947**
	Sig. (2-tailed)	0		0	0	0	0
	N	117	117	117	117	117	117
User Training	Pearson Correlation	.753**	.759**	1	.648**	.572**	.842**
	Sig. (2-tailed)	0	0		0	0	0
	N	117	117	117	117	117	117
User Support	Pearson Correlation	.708**	.739**	.648**	1	.726**	.764**
	Sig. (2-tailed)	0	0	0		0	0
	N	117	117	117	117	117	117
Communication	Pearson Correlation	.655**	.671**	.572**	.726**	1	.693**
	Sig. (2-tailed)	0	0	0	0		0
	N	117	117	117	117	117	117
Performance	Pearson Correlation	.926**	.947**	.842**	.764**	.693**	1
	Sig. (2-tailed)	0	0	0	0	0	
	N	117	117	117	117	116	117

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

Source: SPSS output of survey,2018

Based on the survey result, the correlation between IT Infrastructure & Organization's logistics performance, is positive and they are significantly correlated at ( $R = .926^{**}$ ), ( $P < 0.01$ ). According to MacEachron (1982) magnitude of correlation, the relationship between the two variables is very high or very long. Similarly, the correlation between System Quality and organization's logistics performance is positive and they are significantly correlated at ( $R = .947^{**}$ ), ( $P < 0.01$ ). Accordingly, the relationship between the two variables is also very high or very long.

From the survey result, the correlation between User Training and Organization's logistics performance is positive and they are significantly correlated at ( $R = .842^{**}$ ), ( $P < 0.01$ ) which is very high or very strong. The correlation between User support and Organizations logistics performance is positive and they are significantly correlated at ( $R = .764^{**}$ ), ( $P < 0.01$ ), which is strong or high. The correlation between Communication and Organizations logistics performance is positive and they are significantly correlated at ( $R = .693^{**}$ ), ( $P < 0.01$ ), which is strong or high.

In general, the correlation of five ERP system factors with Organization' logistics performance is analyzed with the help of SPSS. IT Infrastructure, System Quality and User Training are found to have positive and Very high or very strong correlation with Organization's logistics performance. User Support and Communication have Strong or high correlation with the dependent variable Organization's logistics performance.

#### **. 4.4 Multiple Linear Regression Analysis**

Before running multiple linear regression analysis, the researcher has conducted basic assumption tests for the model. These are normality of the distribution, linearity of the relationship between the independent and dependent variables and multicollinearity tests. Each test is discussed below.

### Assumption 1 - Normality Distribution Test

Multiple regressions require the independent variables to be normally distributed. Skewness and kurtosis are statistical tools which can enable to check if the data is normally distributed or not. According to Smith and Wells (2006), kurtosis is defined as “property of a distribution that describes the thickness of the tails. The thickness of the tail comes from the number of scores falling at the extremes relative to the Gaussian/normal distribution”. Skewness is a measure of symmetry. A distribution or data set is symmetric if it looks the same to the left and right of the center point.

The skewness and kurtosis test results of the data is within the acceptable range (-1.0 to +1.0) except the skewness test of Service Quality and it can be concluded that the data is normally distributed. The kurtosis and skewness results are shown in annex B.

### Assumption 2 - Linearity of the Relationship Test

The second assumption for computing multiple regressions is test of the linearity of the relationships between dependent and the independent variables. As depicted in the below scatter the visual inspections of the scatter plot shows there exists a linear relationship between the *ERP effect in the logistics activities of ethio telecom* factors and organization’s logistics performance. The scatter plot is shown in appendix B.

### Assumption 3 - Multicollinearity Test

Multicollinearity refers to the situation in which the independent/predictor variables are highly correlated. When independent variables are multicollinear, there is “overlap” or sharing of predictive power. This may lead to the paradoxical effect, whereby the regression model fits the data well, but none of the predictor variables has a significant impact in predicting the dependent variable. This is because when the predictor variables are highly correlated, they share essentially the same information. Thus, together, they may explain a great deal of the dependent variable but may not individually contribute significantly to the model. Existence of multicollinearity can be checked using “Tolerance” and “VIF” values for each predictor variables. Tolerance values less than 0.10 and VIF (variance inflation factor) greater than 10

indicates existence of multicollinearity (Robert, 2006). For the current data, multicollinearity is not an issue. See appendix B.

Summary: The three assumptions of multiple regressions are met and the next step was processing the regression analysis to determine the values of the model summary (R and R<sup>2</sup>), the model fit (ANOVA) and the beta coefficients.

With the help of multiple linear regression analysis, model summary, ANOVA and Beta coefficient were determined and the regression model was developed. Accordingly, the relative effect of ERP in the logistics activities of ethio telecom factors for organization’s logistics performance was identified.

#### 4.5 Model Summary

In the model summary below in Table 13, the multiple correlation coefficients R, indicates a very strong or high correlation of .997 between organization’s logistics performance and the t independent variables. **R<sup>2</sup> = .993** reveals that the model accounts for 99.3% of the variation in the organization’s logistics performance and is explained by the linear combination of all the independent variables of ERP effect in the logistics activities of the company.

*Table 15 Model Summary of the constructs*

Model	R	R.Square	Adjusted R square	Std.error of the estimate
1	.997	.993	.993	.05932
a. Predictors:(Constant), IT infrastructure, System Quality, User Training, User support and Communication.				
b. Dependent Variable: Organization’s logistics activities				

Source: SPSS output of survey,2018

## 4.6 Beta Coefficient

### Standardized Beta Coefficient

The standardized coefficients are the coefficients which can explain the relative importance of explanatory variables. These coefficients are obtained from regression analysis after all the explanatory variables are standardized.

As it can be seen from table 4.14 below, the standardized coefficient of System Quality is the largest *value followed by IT infrastructure User Training respectively*. The larger the standardized coefficient, the higher is the relative effect of the factors to the logistics performances.

The significance tests of the 5 explanatory variables indicate that IT Infrastructure, System Quality and User Training Factors are significant with p-value ( $P < 0.05$ ) for predicting Organization's Logistics performance. The rest User Support and Communication factors have a p-value  $> 0.05$  ( $P > \delta$ ), and these factors are not statistically significant to predict the Organization's logistics performance.

*Table 16 Beta Coefficient*

<b>Coefficients<sup>a</sup></b>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.003	.025		.105	.916
	IT Infrastructure	.376	.012	.434	30.124	.000
	System Quality	.525	.015	.524	34.863	.000
	User Training	.118	.012	.126	9.495	.000
	User Support	-.005	.012	-.006	-.436	.664
	Communication	-.010	.013	-.010	-.800	.425

a. Dependent Variable: Performance

## 4.7 Discussion of the study

### 4.7.1 System Quality

System Quality is the first Effect of ERP system in the logistics activities of the company factor according to the data analysis result from the current study and its mean value is 2.34. System quality is explained by its fast response when doing tasks on it, running or working always, having minimum fields and screen to do a task, it's integration with other system within the company, working on it without challenges, the server capacity of the system, easy to use and to learn and so on. 57.01 % of the respondents believe that ethio telecom does not have a very good ERP system quality in the logistics activities of the company. System Quality is positively & significantly correlated with organization's logistics performance with ( $R = .947^{**}$ ), ( $P < 0.01$ ). and it is one of the very high or very strong predictors of the dependent variable which is organization's logistics performance with beta coefficient of .525 at significance level .000.

According to Al-Rawashdeh, 2014, The ERP systems have different type of abstraction. In additional to its complexity and modularity, the basic concept in the ERP system is the standardization and synchronization of information. Thus, most of software quality characteristics and sub-characteristics of ISO/IEC 9126 will be applicable to the ERP system quality model with appropriate modification. Because of the new abstraction type in ERP system, some new software quality characteristics should be involved, which can describe new features of ERP system.

The quality characteristics, functionality, reliability, usability, efficiency, maintainability, and portability have commonly been proposed in most quality models. However, scholars have different opinions while choosing sub characteristics of these characteristics

According to the result from the collected data, the basic challenges of ethio telecom using ERP system in the logistics activities is non-having quality system. Specially the server capacity of ERP system in not match with the number of users. It is common to see emails about the frequent interruption of the ERP system, which results the delay of delivery of materials more than a day or days.

#### 4.7.2. IT Infrastructure

IT infrastructure is the second Effect of ERP system in the logistics activities of the company factor according to the data analysis result from the current study and its mean value is 2.96. IT infrastructure is explained by the availability of IT equipment to use ERP system such as computer, server, IT personnel, reliable intranet connection, on time system maintenance, system support and so on. 42.26 % of the respondents believe that ethio telecom does not have good IT infrastructure to support ERP system. IT infrastructure is positively & significantly correlated with organization's logistics performance with  $R = .926^{**}$  ( $P < 0.01$ ) and it is one of the very high or very strong predictors of the dependent variable which is organization's logistics performance with beta coefficient of .376 at significance level .000. This finding is with in line with the findings of previous studies. Some studies have reported that IT can improve logistical efficiency, effectiveness, productivity, flexibility, cost, and service quality (Fujun,2006).

According to the result from the collected data, there is no satisfactory IT infrastructure in ethio telecom to have smooth ERP system in the company. There is also problem related to having reliable intranet connection to do logistics tasks. It is not possible to say the level of IT usage in ethio telecom is high. Specially server capacity limitation has a great negative effect in the logistics activities of the company. There is also maintenance delay in the ERP system, which affects logistics activities.

#### 4.7.3. User Training

User Training is the Third Effect of ERP system in the logistics activities of the company factor according to the data analysis result from the current study and its mean value is 2.71. From the total respondents 51.58 % of the respondents believe that ethio telecom didn't give enough training for user of ERP system in the logistics activities of the company. The correlation between user training and Organizations logistics performance is positive and they are significantly correlated at ( $R = .842^{**}$ ), ( $P < 0.01$ ) which is very high or very strong relationship. and it is one of the very high or very strong predictor of the dependent variable which is organization's logistics performance with beta coefficient of .118 at significance level .000.

The success of the training program depends on its ability to deliver training and knowledge at the individuals' level. In an organization, ERP training needs to be delivered to the managerial personnel, key end-users, general end-users and the trainers. (Vayyavur,2015),

According to the result from the collected data, unless effective training is given for all users of ERP system for the logistics activities it is difficult to have a good logistics activity within the organization. Most of the respondents agreed that they do not know very well how to move commercial items from one point of sales to another due to lack of training in Issuing steps.

#### 4.7.4 User Support

User support is the Fifth effect of ERP system in the logistics activities of the company factor according to the data analysis result from the current study and its mean value is 2.45. According to the respondents 52.23 % of the respondents believe that ethio telecom do not have Immediate support of the system when problems occurred. The correlation between user support and Organizations logistics performance is positive and they are significantly correlated at ( $R = .764^{**}$ ), ( $P < 0.01$ ), which is strong or high relationship. and it is one of the strong or high predictor of the dependent variable which is organization's logistics performance with beta coefficient of -.005 at significance level .664.

The users of an ERP system are usually the ones required to adjust their daily working practices to the new system's requirements. Apparently, becoming familiar with a new ERP system is not an easy task and involves hard working and patience from the part of users. In order to favorably affect users' perceptions about new technology, the real benefits and advantages of using the ERP system need to be continuously reminded. Otherwise, users are not motivated to support the ERP system in that they are not willing to cooperate. This situation provokes conflicts in the relationship and hinders communication (Wang,2003). Therefore, a high degree of user support will strengthen communication effectiveness and conflict resolution. (Dimitrios,2011).

According to the result from the collected data, The ERP help desk of the organization has to do more to give immediate solution and support when the users of ERP system needs support when they are doing the logistics activities using the system. Many expertise is required to handle support requests efficiently.

#### 4.7.5. Communication

Communication is the fourth effect of ERP system in the logistics activities of the company factor according to the data analysis result from the current study and its mean value is 2.76. Based on this research work Communication is explained by employee's awareness about the resources available in the system, employees know how about the important of the ERP system for the organization, clarity of the goal and objectives of the ERP system among the employees and the management of the company and so on. 47.47 % of the respondents believe that ethio telecom does not have good effective communication with in it concerning the ERP system in the logistics activities of the company. The correlation between Communication and Organizations logistics performance is positive and they are significantly correlated at ( $R = .693^{**}$ ), ( $P < 0.01$ ), which is strong or high relationship. and it is one of the strong or high predictor of the dependent variable which is organization's logistics performance with beta coefficient of -.010 at significance level .425. Effective communication is a strong foundation of a trustworthy relationship between organizational members. The more users understand each other, the more effective the communication. Insufficient communication of users' needs, goals and aspirations undermine the ERP system (Dimitrios,2011).

According to the result from the collected data and, ethio the employees of the organization do not have sufficient information about the resources allocated by the organization for logistics activities and there is also problem among the staffs about knowing the importance of the ERP system within the organization.

### 5.1. Summary of the Findings

The total population size was 121 and 121 questionnaires were distributed to the respondents out of which, 117 questionnaires were returned with a response rate of 96.6%. The sum of the independent variables average Cronbach's alpha value is ( $\alpha = 0.7$ ) and the reliability test of the study is located on "Acceptable" range. Out of 117 respondents, 86.3% (101) of the respondents were male and the remaining 13.7% (16) were Female. Out of 117 respondents 80.3% were between the age of 26-40 and the rest 19.7% of the respondents were between the age of 41 and above. 97.4% of the respondents have educational level of first and second degree. 83.8 % of the respondents have company experience of more than ten years while 16.2% of them have less than 10 years of company experience. From the respondents 72.6% were supervisors, 17.9% were managers and 9.4% were house staffs.

The first research question of the study was to find answers for the question How IT Infrastructure of ERP system affects the logistics performance of ethio telecom? The correlation analysis revealed that all of the five factors have significant correlation with the organization's logistics performance. However, the output from the analysis indicated that only three factors are the relevant for ERP system effect in the logistics activities of the company. These are System Quality, IT infrastructure and user training having correlation of ( $R = .947^{**}$ ), ( $P < 0.01$ ), ( $R = .926^{**}$ ), ( $P < 0.01$ ) and ( $R = .842^{**}$ ), ( $P < 0.01$ ) respectively. Based on the percentage obtained from the respondents and on the data, analysis result the current ERP system IT infrastructure of ethio telecom is not satisfactory. It is not possible to have reliable and smooth intranet connection to do tasks on ERP system. The level of IT usage within the company is also not high as expected. More and more reliable IT infrastructure for ERP system is expected from the company for the future.

The second research question of the study was to find answer for the question how System Quality of ERP system affects the logistics performance of the selected company? Accordingly, from the regression analysis, it can be concluded that System Quality accounts the largest share for the change in performance the logistics activities of ethio telecom, which has Beta coefficient

of .525 at significant of .009. Specially the server capacity limitation is the greatest challenges of ethio telcom in its logistics activities and performance.

The third research question was to find answers for the question how User Training, User Support and Communication affect the logistics performance of ethio telecom? From the total respondents 51.58 % of the respondents believe that ethio telecom didn't give enough training for user of ERP system in the logistics activities of the company. The correlation between user training and Organizations logistics performance is positive and they are significantly correlated at ( $R = .842^{**}$ ), ( $P < 0.01$ ) which is very high or very strong relationship. Specially most of the supervisors answered that they didn't know how materials are shipped from one point of sales to another, it greatly affects the logistics performance of the company. From the total respondents 52.23 % of the respondents believe that ethio telecom do not have Immediate support of the system when problems occurred. The correlation between user support and Organizations logistics performance is positive and they are significantly correlated at ( $R = .764^{**}$ ), ( $P < 0.01$ ), which is strong or high relationship. Specially not having timely ERP system interruption maintenance is greatly affecting the logistics performance of the company. Similarly related with communication the study showed that employees are not well aware of the resources allocated by the company on ERP system and they do not well know the importance of the system.

## 5.2. Conclusions

The main purpose of this study is to analyze the effect of ERP system in the logistics activities of ethio telecom by considering ERP system five factors. Based on the findings shown in point 5.1 above the following conclusions are presented by the researcher.

Five ERP implementation factors are identified from the correlation analysis. These are IT infrastructure, System Quality, User Training, User Support and Communication.

- System Quality is the most powerful factors for ERP system in the company logistics activities.
- ERP system factors have positive and significant effect organization's logistics performance.
- IT Infrastructure is one of the important factors for ERP system in the logistics activities of Ethio telecom, this research indicated that it is important predictor of organization Logistics performance, which shows that most of the constructs of IT infrastructure for ERP System not properly addressed and due attention is not given by ethio telecom. Availability of Computers for all users of ERP system in their logistics activities, reliable internet connection, Immediate maintenance of the ERP system and having high level of IT usage in ERP system Play a great role to have high level of logistics performance.
- System Quality is one of the basic factors of having effective ERP system in the logistics Activities of the company. Based on the findings ERP system quality has significant effect on Organization's logistics performance and it can be concluded that the constructs considered for this variable should be managed well in the company. Without System quality it is Impossible to have efficient logistics performance with in the company.
- User Training is one of the important factors for ERP system in the logistics activities of Ethion telecom, this research indicated that it is important predictor of organization's Logistics performance, which shows that most of the constructs of user training ERP System not properly addressed and due attention is not given by ethio telecom. Unless, all users of ERP system in the logistics activities of ethio telecom well trained and equipped It is difficult to have good logistics performance.
- User support is one of the important factors for ERP system in the logistics activities of Ethio telecom, this research indicated that it is not important predictor of organization's Logistics

performance, which shows that most of the constructs of user support in ERP System not properly addressed and due attention is not given by ethio telecom.

- Communication is one of the important factors for ERP system in the logistics activities of Ethio telecom, this research indicated that it is not important predictor of organization's Logistics performance, which shows that most of the constructs of communication in ERP System not properly addressed and due attention is not given by ethio telecom. Unless

### 5.3. Recommendations

. • The regression analysis Indicated that the organization's logistics performance is impacted more by ERP system Quality. Therefore, special emphasis should be given to have improved quality ERP system for users. The respondents of the questionnaires, currently the ERP system quality for the logistics activities of the company is very challenging. The ERP system is not working always because of frequent interruption of the system, it is not respond fast, it takes long time to finish the task, there are many screen fields specially to do issuing, the data in ERP system is not integrated with the current CRM system, it is difficult to do the task on ERP system at the same times by all of its employees due to the server capacity limitation. Therefore, ethio telecom has to do more and more to upgrade its ERP system server capacity and quality like other system of the company.

• The second factor that affect the logistics performance is the IT infrastructure. The result of the respondents and the analysis indicated that it is difficult to say ethio telecom has developed and has accurate IT infrastructure of ERP system. There is no reliable intranet connection to do on ERP system, it takes long time to maintain the system. It is common in ethio telecom the delay of logistic activities more than days. This significantly affects the logistics performance of the company. There for the IT infrastructure of the ERP system should be appropriately managed and emphasis should be given to build standard IT infrastructure for ERP system like the other system of the company.

• Great attention should be given to training in order to improve the capacity of ERP system users

In the logistics activities of the company. Most of the respondents answered that about the training is at Disagree category of Likert Scale. According to this study most of the supervisors do not know how to move commercial items from one point of sales to another, due to lack of training. So, it is better to conduct competency assessment of the ERP system users and arrange training not in the class room but it is by far better to give on job training by taking real example in the system.

- Most of the respondents of this study are at disagree category of Likert scale about the support obtained from ERP help desk. It is difficult in ethio telecom to have immediate support from back office when problem is occurred in the ERP system. As a result, users are facing challenges. So, the company should reorganize the ERP help desk offices and should have highly qualified ERP system professionals.
- In General, Other companies and organizations in Ethiopian should apply this important software in their logistics activities. The researcher saw how it works and advantageous for the organizations.

#### **5.4. Suggestion for Further Study**

Using ERP system in the logistics activities of the companies has a few years practices, unavailability of secondary data and related research work on the researcher topic was the limitation of the study. Lack of awareness about ERP system was another limitation of the study. In the globalization world business achievement becomes dependent of technology utilization. Especially in the logistics activities of the company, the impact of technology utilization becomes mandatory, this study has focused with limited scope of Logistics module on the usage of ERP system. Therefore, the researcher recommends that other researcher shall study more on the importance of system technology utilization for the logistics activities of the organizations.

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# APPENDICES

## Appendix A: Questionnaires

Addis Ababa University

School of Commerce

Masters of Arts program in Logistics and Supply Chain Management

### QUESTIONNAIRE TO ASSESS THE EFFECT OF ENTERPRISIE RESOURCE PLANNING (ERP) IN THE LIGISTICS ACTIVITIES OF ETHIO TELECOM

Date: 04/ 05/ 2018/

This questionnaire has been designed to gather data on “*The Effect of Enterprise Resource Planning in the logistics activities of ethio telecom*’. The findings of the study will be used for a research paper to be presented for the partial fulfillment for the awards of Masters of Arts in Logistics and Supply Chain Management at Addis Ababa University. The responses will be aggregated and used in summary so that no one’s response will be identified in isolation. There are no direct or indirect negative consequences by participating in this survey. The data collected will be used only for the purpose stated in here and will not be shared with anybody else. Your genuine responses will be helpful in the successful completion of the paper. Please give your responses to all the questions. The researcher would like to thank you in advance for your time and consideration in giving the responses.

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## Appendix

### Part I: Demographical Information - Please put 'X' in the box

1.1. Gender

Male    Female

1.2. Age Group:

$\leq 25$   26 – 35   
36 – 40  41 and above

1.3. Educational Status

:

Below Diploma  Diploma   
BA/BSC  Masters & Above

Other please specify \_\_\_\_\_

1.4. Your service year:

$\leq 5$   6 – 10   
11 – 15  16 – 20   
21 and above

1.5. Which division are you working in?

Residential Sales  Finance   
Sourcing & Facility  Human Resources   
Fixed Access Network

1.6. The position you hold in the organization

Staff  Supervisor   
Manager  Officer

Other \_\_\_\_\_

### Part II: Issues Related with the research area

Please select the number in the box which best represents your opinion using a scale of 1 to 5 by circling the numbers in the column. (Please Select Only One Box for each Question).

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

1	IT (Information Technology) Infrastructure	Scale				
1.1	The company has availed computer for all users of ERP System	1	2	3	4	5
1.2	There is reliable intranet connection to use ERP system for logistics activities	1	2	3	4	5
1.3	System interruptions are fixed instantly without affecting logistics activities	1	2	3	4	5
1.4	It is possible to get instant support from system administrators when problem occurs in using ERP system	1	2	3	4	5
1.5	The level of IT usage is very high within the company	1	2	3	4	5
2	System Quality					
2.1	ERP system of ethio telecom is always ready and running as necessary (always working)	1	2	3	4	5
2.2	ERP system of ethio telecom responds quickly enough (Fast Response)	1	2	3	4	5
2.3	ERP system of ethio telecom requires only the minimum number of fields and screen to do a task	1	2	3	4	5
2.4	All data with in ERP system of ethio telecom are fully integrated and consistent	1	2	3	4	5
2.5	Users can work on the ERP system without any challenge in ethio telecom	1	2	3	4	5
2.6	The capacity of the ERP system is enough for all employees to do the task at the same time.	1	2	3	4	5
2.7	There no delay of logistics activities using ERP system in ethio telecom	1	2	3	4	5
3	User Training	1	2	3	4	5
3.1	Training was given exhaustively for all users of ERP system in ethio telecom	1	2	3	4	5
3.3	Further enhancement training is required on the system	1	2	3	4	5
3.4	There was a gap between the imparted training and ethio telecom business requirements	1	2	3	4	5
3.5	The training programs where properly and well designed for end-users	1	2	3	4	5
3.6	Internal staff has been intensively trained on the system	1	2	3	4	5
3.7	You are well trained how Receiving goods through the ERP system and Moving goods from one points of sales to another.	1	2	3	4	5
4	User support					
4.1	<i>Back office technical staffs give immediate support to users when problem occurred in the system</i>	1	2	3	4	5
4.2	<i>The ERP help desk has been well established for providing efficient end-user support</i>					
4.3	<i>Ethio professionals are capable enough to support any system related queries</i>	1	2	3	4	5

4.4	<i>Complicated System support is dependent of the vendor.</i>	1	2	3	4	5
5	<b>Communication</b>					
5.1	Employees are aware about the resources the company has been allocated in ERP system	1	2	3	4	5
	<b>Effective communication spreads the aims of ERP system to all administration of the firm</b>					
5.2	The ERP system of the company provides important information	1	2	3	4	5
5.3	Employees are aware about the importance of the system for the company.	1	2	3	4	5
5.4	The goals and objectives for using ERP system is clear among the top and middle management	1	2	3	4	5
5.5	There are accountability mechanisms that monitor performance and provide system members with useful, ongoing feedback	1	2	3	4	5

#### Part IV: Delivery

Please indicate your level of agreement on the statements by circling the numbers in the column using the following rating scale.

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

##### 3.1 The Effect of ERP system in the logistics activities of Ethio telecom on Delivery

No	Key Performance Indicators	Definition	Scale				
			1	2	3	4	5
1	Order received	The time between Order receipt from user department and materials delivery using the system is at reasonable time	1	2	3	4	5
2	Meet Customers need	The Ability of ethio telecom is high to meet key Customers need by providing their need on time	1	2	3	4	5
3	Notify delivery delay	The ability of ethio telecom to notify of delivery delay or product shortage due to system problem is high.	1	2	3	4	5
4	Modify Order size	The ability of ethio telecom to modify order size or volume during logistics operation using ERP system is high.	1	2	3	4	5

## Flexibility

No	Key Performance Indicators	Definition	Scale				
1	Respond to changes	Ethio telecom has the ability to respond to changes in the volume and types of material to be moved to points of sales using ERP system	1	2	3	4	5
2	Rapidly response to changes	The company possesses the ability to respond rapidly to changes in the logistics activities work environment.	1	2	3	4	5
3	Alternatives	Ethio telecom choses other alternatives to deliver materials to point of sales when there is intermate interruption occurred.	1	2	3	4	5
4	Openness	Ethio telecom is characterized by openness to get new ideas and methods to facilitate its logistics activities	1	2	3	4	5

## Speed/Time

No	Key Performance Indicators	Definition	Scale				
1	Fast logistics services	Ethio telecom is committed to provide fast logistics services to its customers.	1	2	3	4	5
2	On time delivery	The company is committed to deliver orders to customers within the agreed delivery times.	1	2	3	4	5
3	Exchange of information	Ethio telecom is characterized by quick exchange of information with stakeholders for its logistics activities.	1	2	3	4	5
4	ERP system quick Maintenance	The company is committed to maintain its ERP system quickly when problems are occurred.	1	2	3	4	5
5	Quick system support	Ethio telecom is characterized by having quick system support for users from its ERP help desk	1	2	3	4	5

If there is any other issue/ problem that you observed in relation to ERP system Utilization in the movement of commercial items and stationaries as well as payment of different kinds of expenses, please write down here;

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

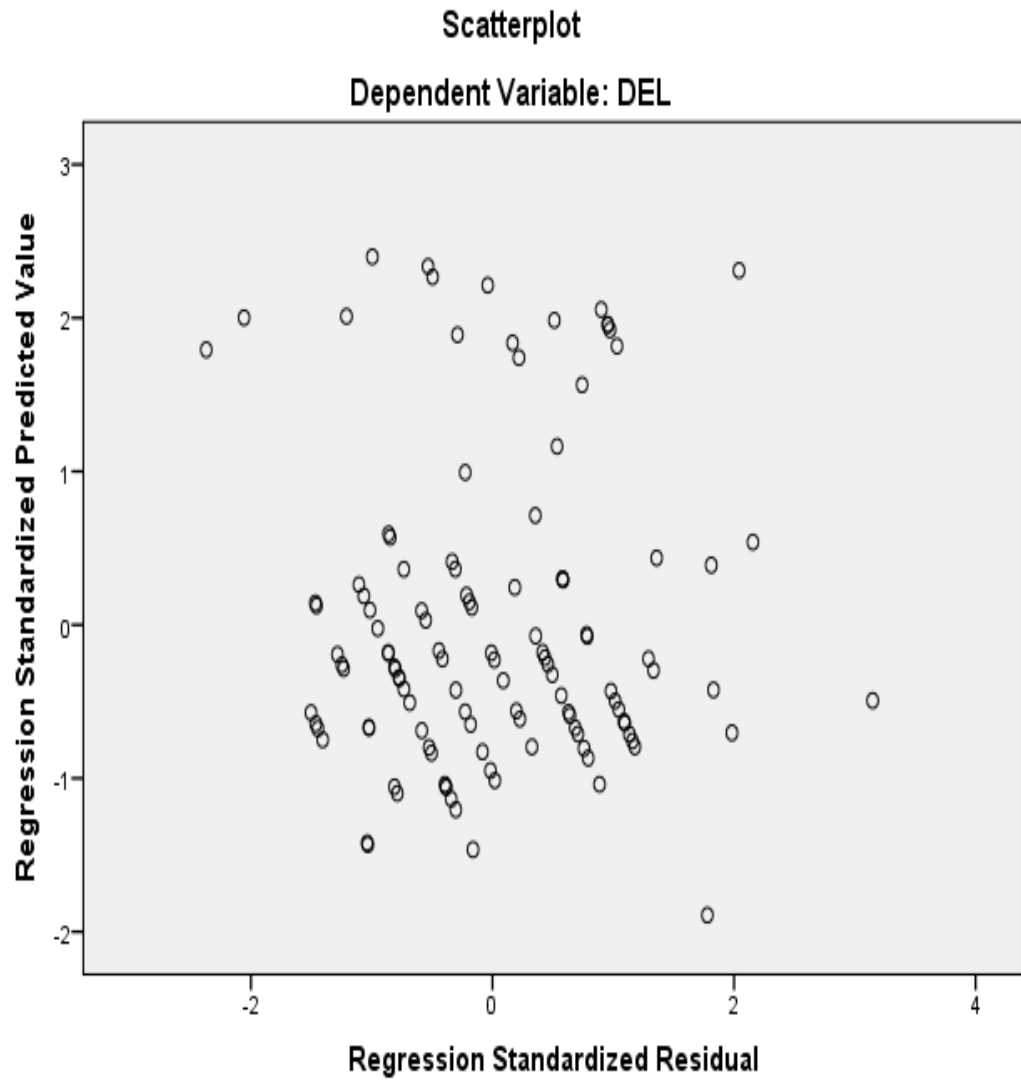
Thank you so much for your cooperation!

## Appendix B: Regression Model assumption Tests

### 1. Normality Distribution test

Descriptive Statistics					
	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
IT Infrastructure	117	.857	.224	.020	.444
System Quality	117	1.164	.224	.288	.444
User Training	117	.449	.224	-.510	.444
User support	117	.600	.224	-.299	.444
COMM	117	.340	.225	-.536	.446
Communication	117	1.274	.224	.532	.444
Valid N (listwise)	117				

Source: SPSS output of the survey, 2018.



Linearity of the Relationship test

Source: SPSS output of the survey, 2018.

## 2. Multicollinearity Test

Model	Collinearity Statistics	
	Tolerance	VIF
1		
(Constant)		
IT infrastructure	.301	3.322
System Quality	.276	3.626
User Training	.354	2.826
User Support	.337	2.970
Communication	.421	2.378

- a. Dependent Variable: Organization's Logistics performance  
Source: SPSS output of the survey, 2018.

