ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE

DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT

The Role of Information Technology in Logistics and Supply Chain Management Performance: The Case of Ethiopian Shipping and Logistics Services Enterprise (ESLSE)

By

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Declaration

I, Yafet Mekonnen declare that this paper is a result of my independent research work on the topic entitled "The Role of Information Technology in Logistics and Supply Chain Management Performance: The Case of Ethiopian Shipping and Logistics Services Enterprise (ESLSE)" in partial fulfillment of the requirements for the Degree of Masters of Art in Logistics and Supply Chain Management at Addis Ababa University. This work has not been submitted for a degree to any other university. All the references are also duly acknowledged.

Yafet Mekonnen

Signature_____

Date May. 2018

Confirmation

This is to certify that **Yafet Mekonnen** has carried out this research work on the topic entitled **"The Role of Information Technology in Logistics and Supply Chain Management Performance**: **The Case of Ethiopian Shipping and Logistics Services Enterprise (ESLSE)"** under my supervision. This work is original in nature and has not been presented for a degree in any University and it can be submitted for the partial fulfillment of the requirements for the award of the degree of Masters of Art in Logistics and Supply Chain Management.

Mengistu Bogale (**PhD**)

Signature_____

Date _____

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List of Abbreviations

ESLSE Ethiopian shipping and Logistics services Enterprises

SCM Supply Chain Management

IT Information Technology

DSS Decision Support Systems

EDI Electronic Data Interchange

RFID Radio Frequency Identification

SPSS Statistical Package for the Social Sciences

ABSTRACT

The ESLSE logistics and SCM department would be the first domain to be benefitted from this research as the study would have a contribution in their program of designing better IT systems. The developments in Information technology has resulted in many possible alternative solutions for managing the logistics and supply chain effectively. Logistics and Supply chain management is information driven function. Information Technology enabled logistics and supply chain management will provide a competitive advantage to on ESLSE over rest of the competitors in market place. IT plays a vital role in decision making process. Information Technology is beneficial for cooperation and coordination within the supply chain. The research design is explanatory that is conducted to be conducting on the role of IT in logistics and SCM performance of the ESLSE. This paper highlights the overview of role information technology for effective and efficient logistics and supply chain management, software focused supply chain characteristics as well as Information Technology tools used in Information technology enabled supply chain management. The data analysis, the research findings and based on the results the researcher gives discussion on the findings and also gives some interpretation of the result. In order to presents findings and the discussion about the role of Information Technology in logistics and Supply chain management performance of ESLSE.

Keywords: Supply chain management, Information Technology, Role, Logistics

CHAPTER ONE

INTRODUCTION

Supply chain management (SCM) is concerned with the flow of products and information between supply chain members' organizations. Recent development in technologies enables the organization to avail information easily in their premises. These technologies are helpful to coordinates the activities to manage the supply chain. The cost of information is decreased due to the increasing rate of technologies. In an integrated supply chain where materials and information flow in a bi-directional, Manager needs to understand that information technology is more than just computers, considering that this study tries to assess role of information technology in logistics and supply chain management performance in the Ethiopia, specifically in Ethiopian shipping and logistic service enterprise located in Addis Ababa with the objective of identifying that hinder logistic and SCM performance.

1.1 Background of the Study

Every organization is struggling in order to survive in today's competitive market place. Traditional logistics and supply chain working is not going to help an organization to cope up with market demands and customers. IT revolution changed the face of logistics and supply chain which was used to be few years back. IT provides an organization to have a smart and robust logistics and supply chain. The challenge lies in creating economic value through vibrant organizations, innovations and applications of strategic tools. Ethiopian supply chain industry is still under development and has understood the role of information technology in logistics and supply chain (Jadhav, 2015).

Information technology plays a vital role in enhancing the logistics and supply chain driver's performance. Information Technology is the use of inter organizational systems that are used for information sharing and/or processing across organizational boundaries. There is an ever increasing need for fully integrated logistics and supply chain management solutions which incorporate all the functionality of network strategy, configuration of supply chain, planning of

demand, transportation and warehouse management systems for any organization (Auramo, 2015).

Logistics and Supply chain management is a management of network of interconnected business involved in the ultimate provision of product and service packages required by end customers. Logistics and Supply chain management consists of flow of goods, information and funds. Main objective of logistics and supply chain is to enhance logistics, supply chain profitability and IT helps to achieve the same thing.IT plays a crucial role in logistics and supply chain decision phase which can be categorized as design, planning, or operational depending upon the time frame during which decision made apply (Rushton, Oxley, Croucher, 2000).

Logistics and Supply chain management execution is managing and coordinating the movement of information, funds and materials across the supply chain. The flow is bidirectional and it consists of information, management of inventory and flow of cash. Recent developing's in technology enable the organization to avail information easily in their premises and is helpful to coordinate the activities to manage the logistics and supply chain. The information cost is decreased due to increasing rate of technologies. Logistics and Supply chain manager's needs to understand that information technology is more than just computers (Hyvonen, 2011).

1.2 Background of the Study Area

Ethiopian Shipping and Logistics Service Enterprise (ESLSE) is Company that is established and owned by the government to maintain the less admirable economic growth that has been registered in the country over the last several years. One of the strategic measures taken by the Federal Government of Ethiopia is merging the former three public enterprises that have until recently been operating separately in a rather similar and interdependent maritime sub-sector; namely, Ethiopian Shipping Lines SC, Maritime and Transit Services Enterprise and Dry Port Enterprise. The Ethiopian Shipping and Logistics Services Enterprise is the result of this merger.

This newly amalgamated enterprise came into being following the issuance of Regulation by the Council of Ministers (Regulation No. 255/2011), and is vested with the huge responsibility of rendering sea-transport & logistics services to the country's importers, exporters, and investors in a more effective and efficient way, by reducing transit time, cost and handoffs. Besides, a truck operating company named Comet Transport SC has recently been transferred to ESLSE following a government decree issued in the mid of (2014).

ESLSE play vital role in the country economy in general foreign trade in particular. As set out in the regulation issued by the federal government of Ethiopia in 2011 (Regulation No. 255/2011), the objectives for which the ESLSE is established are: to reduce coastal and international marine and inland water transport services, to reduce freight forwarding agency, multimodal transport, shipping agency, to provide the services of stevedore, shore-handling, dry-port, warehousing and other logistics services, to provide container terminal services, to engage in the development, management and operation of ports, to establish and run human resources development and training center in the fields of maritime profession, to study the country's, import and export trade demand and thus develop technological capacity in order to render maritime and transit transport services and to engage in other related activities conducive to the achievement of its objectives.

Accordingly, the enterprise put in place its own new organizational structure in Dec 2012 on the basis of which, it has one chief executive officer and four deputy chief executive officers appointed by the government to lead and direct the enterprise at top management level. The enterprise has four sectors led by the four deputy CEO's, namely: Shipping Sector, Freight Forwarding Sector, Port& Terminal sector and Corporate Services Sector (Samuel,2016).

ESLSE is giving so many services to the country by using the major service such as Shipping Sector (Sea Transport Services, Agency Services, Stevedoring, Shore handling), Freight Forwarding Sector (Multimodal transport service: Uni-modal transport service, Customs and port clearing Trucking) and Port& Terminal Sector (Receiving and delivering cargoes) to generate income (Samuel, 2016).

1.3 Statement of the Problem

Technology is vehicle to enhance supply chain competitiveness and performance by enhancing the overall effectiveness and efficiency of logistics system. Hence choosing the right technology for various logistics activities or sub-processes is very crucial to any business to gain competitive advantage in today's competitive market. Information Technology is concerned with improvements in a variety of human and organizational problem-solving endeavors through the design, development, and use of technologically based systems and processes that enhance the efficiency and effectiveness of information in a variety of strategic, tactical and operational situations. Ideally, this is accomplished through critical attention to the information needs of humans in problem-solving tasks and in the provision of technological aids, including electronic

communication and computer-based systems of hardware, software and associated processes. Information technology complements and enhances traditional engineering through emphasis on the information basis for engineering (Capgemini, 2008).

Despite the adoption of information technology in logistic and supply chain management sectors today with its numerous objectives, observation has however shown that, not all the objectives have been realized and felt by users (Bowersox, 2009). It is highly disheartening to observe that, some among many undertaken are not working to standard thereby causing more harm than good to shareholders, potential investors among other users and traders.

Logistic and Supply chain management are unable to comply strictly with the mission statement/corporate mission with information technology. Much of the logistics and Supply chain management does not plan to meet the service quality, and security of goods (Rushton, Oxley, Croucher, 2000).

Depending on ESLSE Annual report and IT employees information, this study aims at investigating this phenomenon and establishes the role of information technology on performance of ESLSE towards operational improvements such as quality, cost, service levels cycle time, logistics (in/outbound), transaction reduction, inventory turns; and strategic objectives such as profitability, financial stability, competitive positioning. IT related problems in the day to day operation of the ESLSE from providing excellent service by disturbing the logistics and supply chain. The problems are related with human factor and non human factor as well. The human factor is related with poor performance of some of the employees in logistics and SCM area as a result of negligence, not understanding the value of IT systems and inadequate training.

The non human factors are lack of sufficient and modern IT equipments, substandard network infrastructure, electric power problems, and higher rate of loss and damage IT equipments, excessive uploading and downloading time to data storage are the main problems. Generally the ESLSE's IT system roles on logistics and SCM were affected by different factors to give a service quality, harmonize and support their day to day activities by technology.

1.4 Research Questions

In order to achieve its objectives, the researcher used the following research questions in line with the research objectives. These include the following;

- What are the practices of IT and related problem in the ESLSE's Logistics and SCM?
- What are the contributions of IT towards logistics and SCM performance?
- What are the factors affecting effective operation of IT in the ESLSE?

1.5 Objectives of the Study

1.5.1 General Objective

The general objective of this study is the roles of information technology in Logistics and Supply Chain Management performance in ESLSE.

1.5.2 Specific Objectives

The study was guided by the following specific objectives

- To determine the IT practices of ESLSE.
- To assess the roles and contributions of IT towards logistics and SCM performance (Efficiency, Effectiveness, and customer Satisfactions) of ESLSE.
- To identify factors affecting effective IT operation in ESLSE.

1.6 Significance of the Study

The ESLSE logistics and SCM department would be the first domain to be benefitted from this research as the study would have a contribution in their program of designing better IT systems. The different IT systems created about the customers' behaviors, service quality and others operations are helpful for planning and decision making processes in ESLSE. The other contributions of the research could be for those academicians (researchers), who are interested in conducting studies in similar areas. Future researchers, who would like to study the contributions of information technology in related organizations, may use this research as a reference.

1.7 Scope of the Study

This research work is about the role of IT on logistics and SCM in Ethiopian Shipping and Logistics Service Enterprise. So, it covers the accumulated employee's related logistics and SCM activities in ESLSE with the IT System of the organization. Though the targets to be

communicated for the study are the logistics and SCM and the IT departments of the ESLSE employee's, some customers will be used in the study.

1.8 Definition of Terms

Logistics: Council of Logistics management (1991) defined that logistics is 'part of the supply chain process that plans, implements and controls the efficient, effective forward and reverse flow and storage of goods, services and related information between the point of origin and the point of consumption in order to meet customers' requirements.

Supply Chain: "Supply Chain is the network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate consumer" - Martin Christopher

Supply Chain Management: "Supply Chain Management (SCM) refers to the coordination of production, inventory, location, and transportation among the participants in a supply chain to achieve the best mix of responsiveness and efficiency for the market being served" -Michael Hugos.

Supply Chain Performance refers to the extended **supply chain's** activities in meeting end customer requirements, including product availability, on-time delivery, and all the necessary inventory and capacity in the **supply chain** to deliver that **performance** in a responsive manner.

Logistics Performance: According to *Chowet al. (1994)* conceptualized that logistics performance is a subset of a larger organizational performance. According to *Fugate et al. (2010)* the concept by highlighting that logistics performance positively impacts organizational performance. According to *Green et al.(2008)* logistics performance as the " ability to deliver goods and services in the precise quantity and at the precise times as required by the customers".

Differentiation or relevancy manifests itself in the ability of logistics to create value for the customer through the uniqueness and distinctiveness of logistical services (Langley and Holcomb, 1992; Bowersox *et al.*, 2000).

Efficiency*:* Organizational efficiency is defined as an internal standard of performance (Pfeffer and Salancik 1978) and is approximately a construct "for doing the things right". From resource

dependence perspective efficiency is an independent measure for evaluating organizational productivity. Efficiency is seen as a "value free" quantifiable measure – highly valued as a rationale for activities such as improvement programs or as a base for rewards. This is problematic for social systems *(Pfeffer and Salancik 1978)* as efficiency is two dimensional (input and output) and social systems usually have several dimensions in their output. An example of this is the interdependencies within as well as among supply chains that cause efficiency in one supply chain and inefficiency in overlapping supply chains *(Dubois et al. 2003).* This means that efficiency within a supply-chain system is difficult to optimize due to limited knowledge of interdependencies within the supply chain as well as towards other supply chains. This is evident in the ramp-up phase of Volvo's S80 model.

Effectiveness: organizational effectiveness is defined as an external standard "of how well an organization is meeting the demands of the various groups and organizations that are concerned with its activities" *(Pfeffer and Salancik 1978)* which approximately is a construct "for doing the right things" or having validity of outcome *(Hines et al. 2000).* A conceptualization of effectiveness as use value is interesting to highlight that how well as well as demands in the above definition is vague. *Håkansson and Prenkert (2004)* seem to refer use value to evaluation of the network's utilization of resources. In resource dependence perspective is effectiveness seen as an independent measure for evaluating organizations. Meeting demands of various evaluators means that conflicting as well as compatible demands are prevalent.

1.9 Limitation of the Study

The limitation of the study is the accessibility to the required data as employees in the Logistics and SCM department is too busy to provide the necessary information in filling the questionnaire and conducting interviews. And also the study laid on the amount of time and financial costs required to enable comprehensive coverage to include more organizations.

1.10 Organization of the study

In this research proposal there are many parts some of them which include the introduction part of the study, statement of the problems and the main objective of the study, the limitation and significance of the research proposal, the research methodology is also includes under the study. This study tries to relate the study with literature review that includes data presentation analysis and interpretation of the study. At the end the major findings, conclusions and recommendation of the study is generalizing.

CHAPTER TWO

RELATED LITERATURE REVIEW

The literature review on logistics and SCM as well as on the IT solutions developed for logistics and SCM showed that the definitions for these two concepts are ambiguous. Therefore, the first action is to give definitions for these terms and then proceed to discussing the relevant previous research.

2.1 Theoretical Framework

This research aims to measure the impacts of information sharing between supply chain partners. This research addresses the operations of small-scale supply chains. For example, *Gavirneni et al. (1999), Lee et al. (2000)* and *Raghunathan (2001)* have studied two-echelon supply chains with one product, while the model of *Evans et al. (1993)* consists of four echelons.

These studies have found that typically the sharing of demand information in supply chains increases the performance of the supply chain by increasing availability and reducing inventory related costs *(Evans etal., 1993; Gavirneni et al., 1999; Cachon* and *Fisher, 2000; Lee et al., 2000).* The benefits of information sharing have been proposed to depend on the predictability of demand. For example, *Cachon and Fisher (2000)* anticipate that information sharing can have a significantly greater value in situations with unknown demand, for example, early sales of new products or promotion situations.

Also *Raghunathan (2001)* has proposed information sharing to be less beneficial in situations where demand is predictable, and where past demand can be used to form a reasonably accurate demand forecasts. Moreover, *Cachon and Fisher (2000)* have proposed that the benefits of IT use are more due to the positive effects of IT on transaction processing efficiency potentially leading to shorter lead times and smaller batch sizes than to sharing of inventory and demand information. *Evansetal. (1993),* in turn, maintain that the feeding of actual demand information forward in the supply chain provides greater benefits than lead time reductions.

To conclude, while focusing on the effects of the information sharing between supply chain partners, the analytical and modeling stream of research does not discuss the actual means of information sharing.

Thus, these studies do not directly discuss the use of IT for information sharing between supply chain partners. Nonetheless, these studies are relevant for the study as the sharing of planning information clearly is one the purposes for which IT can be utilized in SCM.

Information technologies which matured in business life in time and based on more realistic bases and needs can today bring in significant incomes and enabled them to reach to promised efficiency levels. The Internet with its structure open to general use, low cost compared to value-added networks, its use without special rules and world wide access feature plays a strategic role in the spread of electronic processes among enterprises. At this point, it can be said that there are two main reasons for businesses to use the Internet. One of them is the low establishment and application cost of the Internet thanks to its characters by its nature. The other is that thanks to its high influential power on the environment, the Internet improves opportunities resulting from new cooperative relations more effectively (Manthou et al., 2004).

In recent years, with the development of computer systems and communication technologies, information technology supported supply chain applications (e-scm) started to be used more commonly considering the huge value add potential of supply chain (Presutti, 2003). Considering these two powerful solutions together, supply chain management model and processes that are supported by IT applications have more significant impacts on the business performance.

One of the most important IT applications in this area is the supply chain planning and optimization tools that enable visibility, finding optimized solutions for complex planning problems and integrating whole value chain. The visibility and synchronization of the information such as order and inventory, companies reach on time and effective purchasing, production, sales and delivery plans (Yüksel, 2012).

Another supporting application is Electronic Data Interchange (EDI) that enables real time data interchangeability between all parties in the supply chain (Peppard, 1993). A supplier portal with the information on price, order, quality, logistics and inventory indicator is an example how supply chain performance can be improved by leveraging internet applications (Manthou et al., 2004). With EVD, businesses make changes in one or more than one level can integrate information systems with the activities of their businesses. With IT based systems, businesses can continuously monitor their stock levels and stock needs can be automatically transferred to the supplier with EVD system. Such an application decreases safety stock for the products purchased and shortens circulation period. Besides, with coordination between supply chain

members', on-time production applications can be realized. EVD makes it possible to monitor orders on the computer and to achieve on-time delivery (Yüksel, 2002:273). Besides the applications mentioned above some other IT tools like Product Data Management (PDM), Customer Relationship Management (CRM), Supply Chain Planning System, Supplier Relationship and Warehouse Management System, Geographic Informatics, etc. support companies for a better supply chain performance.

Product Data Management (PDM): PDM tools make production process integration easier by contributing design engineering and are used in supporting engineering based on cooperation. Besides, quality specifications in production, scraps, re-procession, stops and tools/equipments used for analyses about them can be described (Müftüoğlu, 2013).

Customer Relationship Management (CRM): CRM, which is an institutional approach to understanding customer behaviors via continuous and appropriate communication, makes it possible for the business to reach to the right customer with the right product or service through the right channels on right time (Alkan and Cantürk, 2013).

Supply Chain Planning System: The planning of raw material and materials to be supplied, supply chain planning systems like demand planning, advanced planning and scheduling are applications which coordinates limited material and capacity resources in line with changes common in a business environment. These systems are generally used in strategically and tactical planning covering long term (Patterson et al., 2013).

Depot Management Systems: Depot Management Systems are systems which are used in monitoring and controlling stock movements in the process from the reception of products sent till their purchasers. With a depot management system in which a number of depots are formed and monitored, all depots are easily managed on a system, input and output are saved and controlled (www.sistek.com.tr, 2008).

Geographical Information Systems: Information is accumulated in one system and transferred and saved on the computer, and their analysis using various scientific and practical models. And it is printed and displayed on sheets of any size on the map; data are shown with graphics and placed on the map make up geographical information systems. Correct and complete information entrance, this information is to include not only what is where but also properties which give details about physical structures (www.sakarya.gov.tr, 2008).

Thanks to its cutting edge in data collection, procession and distribution, it makes it easier to integrate independent supply chain components, contribute to the improvement of cost, time, quality and service and makes contributions to supply chain performance. Especially, developments in network technology lead to radical changes in commercial affairs and increases the performance of the supply chain by offering new methods to businesses for growing their markets, presenting their products and services, increasing their efficiency and for earning customers and preserving them (Papazoğlu and Tsalgatidou, 2010).

2.1.1 Supply Chain Management and Inter Organizational Information Systems

Supply chain management has emerged as a management discipline in the past couple of decades and has attracted attention from both practitioners and academics. The development of global markets forces businesses to seek management approaches that can meet global demand efficiently and effectively by working with partners worldwide. The global competition has brought customers an unprecedented number of products and services and also set new expectation standards for firms to meet market requirements. Information technologies have increased information availability and, manufacturing flexibility, but doing so has increased management complexity (Mabert and Venkataramanan 1998). Facing these challenges, managers and researchers have realized that the collection of functional activities through which raw materials are converted into finished products for sale to customers should be systematically managed as a supply chain.

However, the concept of supply chains is not consistently interpreted by all. Some have held a restricted definition of supply chains which refers to the relationship between a firm and its first-tier suppliers, while others take a broader view by including all upstream and downstream partners to a firm as part of the supply chain. The latter view is consistent with the "value chain" approach in which all activities required to bring a product to the marketplace, including supply/purchase, manufacturing, and distribution function, are considered essential functions in the supply chain (Ho et al. 2002; Mabert and Venkataramanan 1998). This research adopts the value chain view in defining the term supply chain. Therefore, according to Mabert and Venkataramanan (1998), *supply chains* are the "the network of facilities and activities that perform the functions of product development, procurement of material from vendors, the movement of materials between facilities, the manufacturing of products, the distribution of

finished goods to customers, and after-market support for sustainment." Furthermore, s*upply chain management* is defined as the systematic and strategic management of key business processes among a network of interdependent suppliers, manufacturers, distribution centers, and retailers in order to improve the flow of goods, services, and information from original suppliers to final customers, for the purpose of improving the long-term performance of the individual firms and the supply chain as a whole (Cheng and Grimm 2016).

As inter-organizational interactions become strategically indispensable to organizations but meanwhile grow increasingly complex, organizational researchers view supply chains as fruitful ground for studying strategic inter-organizational issues (Chen and Paulraj 2004a). Subsequently, SCM draws attention from researchers in disciplines such as management information systems, marketing, organizational behavior, and strategic management. Empirical research methods, such as surveys and case studies, have been adopted by a sizable number of research papers with an organizational focus.

2.1.2 IT and Supply Chain Management

Research classifies supply chain relationships into three levels – operational, tactical, and strategic (Shah et al. 2002). These three levels of relationships are largely characterized by the information sharing behaviors of the supply chain firms (Rai et al. 2006). The operational level supply chain relationships focus on exchanging transaction based information between partners using inter organizational information sharing technologies such as EDI or extended ERP, as well as transaction-cost reduction programs such as Vendor Managed Inventory (VMI). At the tactical level, information sharing does not occur only between single departments across firms, but involves multiple divisions or functional departments within a firm or across firms. Information sharing goes beyond transactional efficiency to achieve further productivity and profitability goals. Examples of SCM initiatives at the tactical level include Collaborative Planning, Forecasting, and Replenishment (CPFR), Continuous Replenishment (CRP), or sharing of Point-of-Sale (POS) demand information. The supply chain relationships at the strategic level involve gathering and sharing competitive intelligence and necessitate the decision support functionality of IT applications (Akkermans et al. 2003). Despite various focuses of information

sharing, the SC relationships can be highly collaborative or can involve one party dominating the information sharing processes with another party (Malhotra et al. 2005).

The research on IT impacts in the context of SCM has primarily examined the role of specific technologies and innovations, such as EDI, CRP, and RFID in improving SC processes and firm performance. Srinivasan et al. (1994) find that suppliers who use EDI to support manufacturing in a Just-in-Time (JIT) context have better delivery performance in terms of the level of shipment discrepancies. Raghunathan and Yeh (2001) show that continuous replenishment facilitated by CRP benefits both manufacturers and participating retailers. Lee et al. (2008) propose that a firm can use RFID to change its basis of competition from an efficiency-oriented strategy to strengthening of customer loyalty by increasing customers‟ value perceptions. In essence, supply chain IT can improve supply chain efficiencies by reducing uncertainties associated with information unavailability, incompletion and distortion.

2.1.3 Information Technology in Customer Service Delivery

Delivering the required service to the customer is challenging. Either interacting personally or through information processes, customers' perception concerning a market offering is built upon the ability of the service provider to attractively convince their various target market. Rust and Chung (2006) state that customer-information gathering has a greater potential link with meeting customers' needs better. More so, satisfying customers' needs are based on customers' purpose and customer-oriented services channeled to their various needs in order to solve particular problems of the customers. Furey (1991) points at customer service delivery enhancement via convenience provision, information provision for management use and extra services offerings as factors for information technology practices. Thus, many competing roles of IT in service embraces entry limitation, enhancing production, and generating revenue (Fitzsimmons & Fitzsimmons, 1997). Heskett et al. (1997) added that the emergence of the application of information technology is a crucial feature to customer satisfaction via various channels of delivery. Customer data is considered to have value and the potential to augment the customer-organization relationship. The storing of data for later retrieval is known as data warehousing, and the manipulation of the warehoused data is known as data mining. These new technologies can make customers data available up-to-the-second and allow organizations to communicate

with customer directly. These new technologies embrace the internet, computer-telephony and telecommunication in call centers (Evan, O'Malley & Patterson, 2014).

A tactical improvement in an organization's bargaining position relative to those of customers is aimed at providing unique and meaningful information and services that require drastic changes. Information technology can promote meaningful information or service offerings previously unavailable and potentially of very customers high value (Bakos & Treacy, 1986). Thus, when customer relationship is technology inclusive, it supports directly and/or by coordinating and restoring confidence in customer especially when changes are experienced in both training and other organizational changes (Evangelia & Michalis, 2006; Sweat & Hibbard, 1999). Thus, enhancing customer services can be endangered if mismanagement of technology exists; even in its delivery (Asbrand, 2014).

2.1.4 Information technologies in support of information systems, logistics

Information technologies are now present in all areas of business and enable the transition "from the paper economy" in the virtual reality. Technology, e-business is achieved faster, more accurate and more efficient data exchange, easier and more effective dissemination of information, ie. effective communication between all participants in the e-chain. The time required for the transmission of messages from one end of the world on the other, is now measured in seconds. Rapid technological changes affect the area of integrated logistics including the use of laser bar code scanning, integrated circuits, electronic data, satellite data transmission, artificial intelligence, software for warehouse management, etc. Modern managers see the development of logistics information technology as a great opportunity to improve the performance of all logistics activities. All phases of the logistics can be included in the wide application of information technology, which will shorten the time of the exchange of information and thus the completion of orders and this will lead to huge savings in business.

In the sphere of logistics operations now apply many information technologies and some of them will be presented in more detail below:

− Decision Support Systems (DSS);
− Electronic Data Interchange (EDI);
− Bar code system;
− Radio frequency identification (RFID);

− Satellite tracking of vehicles and others.

Solving complex methodological procedures and problems in day to day operations of logistics may speed up and facilitate the application of decision support systems (Decision support systems - DSS). These systems are intended to provide every kind of information support as an input for logistics easier decision-making (Patterson, 2014).

DSS should provide logistics manager in time the information, which will also be accurate, relevant and complete. It must also display information in an appropriate form, to be easy to understand and operate. Information displayed by this system can be the result of internal or can be collected from external sources through the different opinions and forecasts to help a manager. To DSS system was finally able to model through which solves the real problem simplify where appropriate and possible, and that in those aspects that keep his analyzes in detail the real complexity. Decision support systems supporting all phases of decision-making process, starting from the stage of formulation of the problem, through the design phase, selection phase, all the way to its implementation (Patterson, 2014).

Decision support systems provide support for decision-making at all levels of decision-making logistics, or are of special importance to the higher levels. Unlike management information systems, predominantly horizontal facilitate the flow of information, decision support systems supported vertical information flows and so help each other with the integration of the information used at different organizational and managerial levels. So, for example, logistics managers can more easily and quickly decide on the amount of purchases or time when you need to access procurement (Patterson, 2014).

Systems to support decision-making are very efficient but certainly cannot replace managerial decision-making. Can increase the efficiency of decision-making in logistics, and speed in decision making for logistics managers is crucial.

The IT support Integrated Logistics is now widely used electronic exchange of data in a modern way, providing timely and accurate information. Today, electronic data interchange applicable in almost every aspect of integrated logistics, because it allows the flow of documentation i.e. paperless. Completely replaces traditional forms of communication by letter, phone or fax. Thus significantly reducing administration, inventory, costs, increases productivity, logistics first and then the whole enterprise. Perhaps the greatest benefits of the application of electronic data

interchange greater focus on the customer and quickly responding to their needs (Patterson, 2014).

Electronic data affected the way people live and work in all areas, and one of the major impacts is the phenomenon of e-commerce, buying and selling goods and services that erase geographical borders. A large increase was recorded in this area, since the efficiency and effectiveness of logistics key factors of electronic commerce.

There are two basic types of e-commerce: from entrepreneurs to entrepreneurs (B2B-business to business) and from entrepreneurs to customer (B2C - business to customer). Thus, B2B companies interact with each other in many ways, including the purchase of raw materials and services, obtaining information, increasing speed, communication, monitoring, and other products. There are great benefits of B2B commerce and reflected in cost reduction, easier predicting the markets and reducing inventories. But the most attractive is that this mode can make the company more efficient.The second, however, e-commerce category of entrepreneurs to customer (B2C), where trade buyers cooperate with the company over the Internet to obtain goods, services or information. Otherwise, management of integrated logistics in this way for lower purchase costs, faster exchange of information, electronic payment, shorter delivery times and even better service and higher profits. B2C trade advantage is the reduced need for intermediaries. No, however, although the effective use of the Internet can reduce and simplify the supply chain, its complete abolition is not possible because many products require the physical supply chain in order to complete the delivery of the product. The mass of the products are now sold to consumers and a business over the Internet is large and in 2000 amounted to over 2 billion of orders. According to agency reports, the total turnover over the Internet at the global level in 2001 was around 444 billion dollars, while in 2004 reached the incredible sum of 2.7 trillion dollars.These data show that from a logistics system requires high speed and efficiency.

Especially in recent years intensively working on improving electronic commerce with the government. Thus, there are: G2C (government to customer, or a government - users), G2B (government to business or government - entrepreneur) and G2G (government to government, or the government - the government). Those shops are a symbol of the modern state, which applies the principles of modern communication and thus exchanges information with companies, customers, or the governments of other countries (Patterson, 2014).

No matter what type of e-commerce benefits, one thing is certain: it will affect the integral logistics system as a result of e-commerce integrated logistics managers are faced with increasing customer expectations, requirements for quick delivery of products or services and direct communication with buyers. A commercial practice of this kind will still continue to pose a challenge for logistics managers in the future. The importance of e trade is rapidly growing in the world and talk about the increasing traffic in this market. Thus, for example. Last year on Monday, the first day after the Thanksgiving weekend in the US, called "Cyber Monday" due to the start line on big promotion, the day with the largest on line purchase in history. That day has the highest line on turnover of 1.25 billion dollars. On the same day two years ago, the turnover of one billion dollars. The term "Cyber Monday" has introduced The National Trade Federations in 2005 in order to encourage customers to buy on line Monday, after the big feast. The idea was accepted by the sellers of the day offer great discounts and free delivery, to make as much use on the growing trend of online shopping (Patterson, 2014).

2.2 Empirical studies

Two streams of empirical studies on the use of IT in SCM can be identified. The first stream focuses on a specific technology or application area, and the second stream studies the application and benefits of IT in general. In the research focusing on specific technologies or application areas, there exists a distinct body of research on the adoption factors and impact of Electronic Data Interchange (EDI) (see e.g. *Iacovou et al., 1995; Mukhopadhyay et al., 1995; Tuunainen, 1998*). Here, for example cost reduction objectives *(Mukhopadhyay et al., 1995)* and volume of transactions between supply chain partners *(Tuunainen, 1998)* have been associated with the adoption of EDI links. Further, for example, the use of Extended Markup Language (XML) for supply chain integration has been studied *(Nurmilaakso et al., 2002)*.

As for research focusing on specific application areas, for example, the tracking systems and their importance for the efficient coordination of Logistics flows have been widely studied *(Harris, 1999; Stefansson and Tilanus, 2001; Ala-Risku et al., 2003; Kärkkäinen et al., 2003).* According to this body of literature, tracking is needed especially in situations with in-transit consolidation, and in project-oriented businesses. These tracking studies, however, are not empirically founded and thus, do not reveal how tracking systems and tracking information is actually utilized by companies.

As compared to the research focusing on specific technologies or application areas, research on the use and benefits of IT in SCM without the focus on specific technology is fewer in number. The research on the benefits of the use of IT in SCM includes a number of surveys investigating the impact of IT on supply chain integration, customer integration and service *(Closs and Savitskie, 2003),* supply chain time performance *(Jayaram et al., 2000),* financial performance, or a combination of these *(Vickery et al., 2003).* Meanwhile, *Auramo et al. (2005)* performed an exploratory multiple case study on the benefits of IT in SCM, and *McLaren et al. (2004)* conducted a multiple case study on how different SCM IS capabilities support different operations environments.

A number of empirical studies of SCM try to link myriad supply chain practices with performance outcomes, both at the firm level as well as at the supply chain level. For example, Monczka et al. (1998) investigate the success factors in supply chain alliances. Tan et al. (1999) study the association between manufacturers‟ supply chain practices, such as total quality management and customer relationship management, with manufacturers‟ performance. Despite the interesting findings resulted from this group of research, the empirical studies in SCM have been criticized as primarily descriptive, lacking theoretical foundations and contributions (Croom et al. 2000; Ho et al. 2002). This makes theory building in SCM a difficult, yet necessary, effort. Because different firms engage in different strategies and tactics in their implementation of SCM practices, research with an excessive focus on concrete SCM practices is difficult to generalize and therefore, has less predictive power. Consequently, recent recommendations encourage researchers to focus on the inter organizational capabilities that integrate a firm with its network of suppliers and customers (Rai et al. 2006; Straub and Watson 2011).

However, common to these studies is that while helping to assess and understand the value of IT use and integration for SCM, they do not help in determining how companies actually use IT in SCM.

2.3 Conceptual Frameworks

There are some few classification frameworks that describe how IT is used for logistics and SCM in the previous literature. Bagchi and Skjoett-Larsen (2002) examine the role of IT and organizational integration in logistics and supply chain performance.The focus of these studies being on assessing the roles of IT in logistics and supply chain management performance in ESLSE. Meanwhile, in their research, Kauremaa et al. (2004) have focused on the ways companies use IT in SCM and choose to classify the use of IT in SCM to transaction execution and information sharing.

Based on the rarity of using IT for information sharing among their sample of companies studied, they hypothesize that the drivers and prerequisites of using IT in transaction execution and in information sharing differ, and that the benefits of IT in Transaction execution is easier to quantify (Patterson, 2014).

Furthermore, they suppose that ESLSE use IT for transaction execution in situations with high transaction volumes and stable business relationships, while IT is uses for information sharing especially in environments with demand uncertainty and frequent product introductions.

The most severe limitation of this study is that the driver of using IT for transaction execution and information sharing are hypothesizes, and cannot be validates by their research data.

To conclude based on this literature review, there is a lack of research on how companies actually utilize IT in the management of their logistics and supply chains. Furthermore, there is a limited knowledge on the factors that drive the companies to use IT in a specific way in their logistics and SCM efforts. These identifies shortcomings of prior research create a need for research that this study aims to address (Patterson, 2014).

2.3.1 Information Technology Integration

Supply chain relationships play an important role in achieving the firm’s goals. The coordination and integration of activities with suppliers and understanding of customer’s needs results in greater benefits for companies. According to Bradawl, (2000) supply chain management is directly related to relationship management, which includes suppliers and customers. Strategic supplier partnerships and customer relationships are main components in the supply chain management practices (Bradawl, 2000), leading to information sharing, which is one of the five

pillars in achieving a solid supply chain relationship (Bradawl, 2000). Two sub-factors are considered in the model relationship with suppliers and customers Companies are inclined to work with different suppliers in different ways. It is important that the relationship with suppliers satisfy their company needs. Bowers, (2009) mentioned that in commodity products, it is common to find an adversarial relationship mainly based on price between buyer and supplier.

This type of relationship with suppliers does not allow for cost reduction in the supply chain. It may be beneficial to network the supplier, to develop partnerships and alliances that will benefit both partners. This could be based on Production, personal, and or symbolic networking that will turn on strategic alliances (Bradawl, 2000), allowing the information sharing, risk sharing, obtaining mutual benefits and coordinating plans, permitting the improvement of the supply chain The global markets offer a variety of products of different quality and cost. As a result, companies are always competing and trying to reduce costs and improve quality. According to Bowers ox, (2009) customers look for more choices, better service, higher quality, and faster delivery. The relationship with customers has turned a strategic issue for today's companies.

2.3.2 IT use on customer service delivery

Business management consists of leading, planning, organizing, monitoring and controlling all the involved actors and activities in a company to achieve goals and objectives.

Sullivan (2005) asserts that, "as the process of managing networking between companies" describe it. Fast changes in customer demand, globalization of markets, and changing technology require companies to focus their efforts on improving competitiveness, trying to achieve customer's satisfaction through adding more value to their products.

Thus, improving business process performance is critical for business management (Kohli & Devaraj, 2003). In addition, process strategy is used to improve manufacturing performance, and as result business performance (Sullivan, 2005). Managers view marketing strategy as a tool for improvement of their financial returns (Sullivan, 2005). In addition, innovation should be seen as part of business management, allowing the implementation of new processes, products, and services to respond promptly to customers' requirements (Sullivan, 2005). The customer's perception is not always the same as the product manufacturer's perception. Customers may give

more value to low cost, on time delivery, delivery date certainty, or receiving a customized product (Simchi-Levi et al., 2003).

According to Bowers ox, (2009) manufacturers and retailers are always looking for practical after-sales policies that will permit them to enhance customer satisfaction levels. Furthermore, an analysis conducted by Kohli & Devaraj, (2003) showed that customer-firm-supplier relationship management improves operational performance and customer satisfaction. Based on this, a sub-factor customer service is identified. The goal of the companies is to give customers the best service in an efficient and effective manner (Closs & Kefen, 2007) without forgetting about information such as product description, product availability, order status, shipping dates, and assisting them in all what they need Closs & Kefen 2007)). Kohli & Devaraj, (2003) states that customer service is defined by demand forecasting, service levels, order processing, parts/service support, and aftermarket operations.

2.3.3 Tracking and security System

This has had a lasting impact on the security of both the data and informations. In Kenya, the requirement by all truckers to install the Electronic Cargo Tracking System (ECTS) was initially met with opposition. However, truckers have slowly embraced the ECTS, which seeks to replace the security bond while monitoring cargo in transit and providing real time information on location, security and condition of cargo and assets (Bradawl, 2000).

The ECTS is currently being implemented by customs authorities in many parts of the world to mitigate against a range of risks such as significant tax loss, cargo theft, and improving regulatory compliance. The use of modern day technology such as bar codes and RFID makes it possible to access more precise information on the stock. Radio-frequency identification (RFID) is the wireless non-contact use of radio-frequency electromagnetic fields to transfer data, for the purposes of automatically identifying and tracking tags attached to objects. One of the major advantages of radio-frequency identification is that information exchange between tags and readers is rapid, automatic and does not require direct contact or line of sight (Bradawl, 2000). This will allow for access to more precise inventory management information. The researcher anticipates establishing whether there is any correlation between this and the performance of logistic and Supply chain management.

2.3.4 INFORMATION FLOW

According to Maurer (2011) The time taken to handle any customer issues, timely delivery, operational flexibility and sustained quality have become fundamental in successful business today. The success of aligning a supply chain to attain these results depends largely on the use of efficient communication and information technology. Communication between members of supply chain requires that relevant information is transferred from its point of inception to the point of use. Maurer (2011) also noted that the transfer of information entails an efficient flow of information between systems, systems and human being which is directly associated with the effective interoperability between the various entities handling the relevant information.

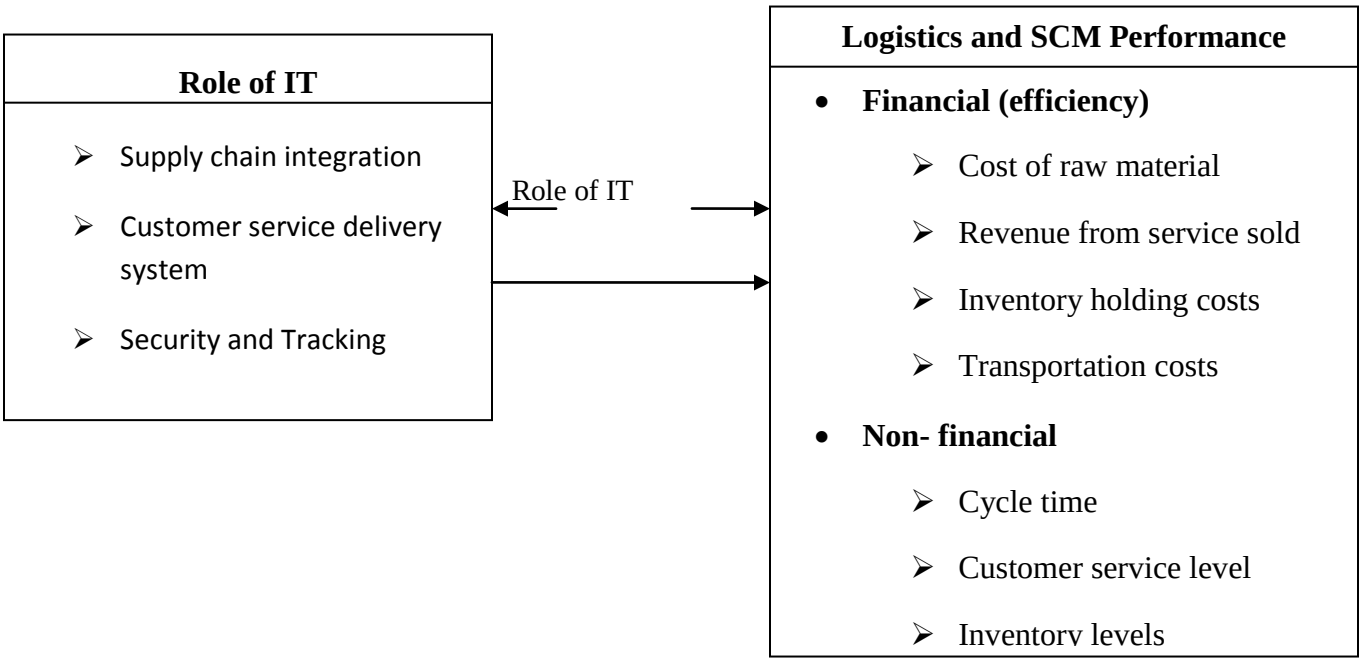
The future of the information technology to logistic performance is characterized by many upcoming challenges and opportunities, the logistics business has also become more volatile and uncertain (Melniyk*et al.*, 2009). The trend towards globalization has steadily increased with the effect that supply chains have become longer and more complex (Ballou, 2004). Moreover, customer expectations have changed insofar as they demand quicker response times and more convincing offer (Coyle et al., 2003)

The proficiency of IT adoption in managing information flow, facilitating operational processes and supporting decision making, this can be measured by examining how IT has an impact on logistics performance. Li et al (2009) noted that the IT and information-sharing capabilities have a direct effect on the supply chain integration and logistics system. The benefit of instant information sharing provides electronic links that support communication and collaboration along the supply chain. In the short-term perspective, the information is provided to managers for optimally allocating and utilizing available resources for increasing the efficiency and effectiveness of daily logistics operations. According to Elbashir et al, (2008), IT in the long term systems provides the ability to analyze business information in order to support and improve management decision making across a broad range of business activities

Automation has also resulted to smooth information flow providing easy links between employees, suppliers, forwarder, transporters and the clients. It lets real-time/online information communication and data exchange through the entire supply chain management to become realistic, speaking of time and cost (Wong et al, 2009).

IT is generally divided into positioning, tracking, and communication technology infrastructure. With good communication and cooperation along the supply chain, ICT and LIS enable the combination of operational and information flow, which provides transparent networks for suppliers and customers. According to Zhang et al (2011), supply chain visibility can increase the collaboration among supply chain members via real-time data sharing and enhance time-based delivery (Iyer et al, 2004). With sufficient information and with increased visibility and communication between various logistics operations and shareholders, different parties along the supply chain can promptly make appropriate decisions (Golicic et al, 2002)

Fig 2.1 Conceptual frame work



Source survey 2018

The conceptual frame work shows that IT plays a significant role in the logistics and supply chain management performance in the form of connecting improved IT roles for an enterprise. The connecting role of IT is that the flow of inputs to the company (the inbound logistics), other services like logistics activity within the enterprise and the services of the enterprise for their customer (the outbound logistics). In the development and maintenance of logistics and Supply chain management information systems both software and hardware must be addressed. Hardware includes computer's input/output devices and storage media. Software includes the

entire system and application programmed used for processing transactions management control, decision-making and strategic planning.

2.4 Research gaps

The literature shows that there is a little research, which has been done on the role of IT on the performance of the logistic and SCM of ESLSE. However, literature has shown very little concerning the direct role, impacts of IT on the service delivery on the logistic and SCM activities. Many researches which have been done majorly dwell on the IT impact, roles on the organization in general. This paper intends to explore more on the actual role of IT on logistic and SCM activities in Ethiopian Shipping Lines Service Enterprise (ESLSE).

CHAPTER THREE

METHODOLOGY OF THE STUDY

3.1 Design of the Study

The research design is explanatory that is conducted to be conducting on the role of IT in logistics and SCM performance of the ESLSE? Explanatory study (causal research) involves explaining causal relationships between variables *(Saunders et al., 2003).* The problems under explanatory research are also structured but instead of merely describing a situation, the researcher needs to deal with "cause-and-effect" problems as well *(Ghauri & Grønhaug, 2005).*

In order to do the research, both qualitative as well as quantitative types of data were used in order to get full information. The data was collected by conducting in-depth interview from different logistics and SCM activities including the staffing of IT, logistics, and Supply chain management.

In this Study the researcher applied explanatory type. The reasons for this is certain confusion and gaps in theory about the role of IT in logistics and SCM performance provides to mining ESLSE which is necessary to clarify to be able to undertake a study of more explanatory type regarding the research subject.

3.2 Research Approach

In the research methodology literature, the deductive and the inductive approaches are commonly used as two different alternatives to construct theories. The deductive approach process begins with development of a theory and a hypothesis, followed by information collection and a research strategy to test the hypothesis. The conclusion is drawn out of logical reasoning *(Saunders et al., 2003).* Within the deductive approach, facts are gathered to confirm or disprove the hypothesis that has deducts from earlier theories or propositions. The inductive approach is opposite, as it is based on empirical evidence and is considered to be one of the first steps in scientific methods where the researchers observe facts to generate a theory which is consistent with the facts *(Ghauri & Grønhaug, 2005).* By applying this approach, the researcher collected data and developed theory as a result of the data analysis *(Saunders et al., 2003).* In this

Study an inductive approach is use since the researcher start the research process with ideas and facts that leads to theories.

3.3 Qualitative or Quantitative Research

The study uses qualitative research methods, since the aim of the research is to analyze the role of IT service providers in the logistics and SCM performance. Therefore, the qualitative research is suitable for this purpose since this research provide its reader a new and deeper way to comprehend the complex phenomena.

3.4 Research Strategy

According to *Saunders et al. (2003)* there are several possible research strategies, such as experiment, survey, case study, grounded theory, ethnography, and action research. This research is conducts as an explanatory study.

3.5 Data Type and Source

The type of data collected includes both primary and secondary type of data. The instrument includes for the primary data, questionnaire and interview are the main one while for the secondary data, review of different manuals, journal with regard to the IT and logistics and SCM activity of the ESLSE were studied in more detail. The primary data were collected from employee of the ESLSE and customers that use IT system services.

3.5.1 Primary Data

The researcher uses semi-structured interviews with open-ended questions. The researcher considers it appropriate to use semi-structured interviews because the interviewees are given the freedom to express their views in their own terms. Besides, the interviewee was allows to ask the interviewer questions in order to clarify interview questions that are unclear, and in that process the researcher can gather more information.

3.5.2 Secondary Data

Secondary data was data that already exist, may easily be obtained and has historical value. The data is considered overall to be useful when establishing comparisons and evaluating data. Secondary data is divided into internal and external secondary data. Internal secondary data was data that has already been produced by organizations and private individuals and gathered to constitute a veritable data source. External secondary data are studies that have been published or are in the process of being published within the studied research area and are indispensable to the spread of the specific knowledge and evolution of the research *(Thietart, 2001).* Moreover, secondary data has been developed to help to solve the problem in hand and should therefore be relevant, accurate and available. Looking at secondary data is useful not only to find information but also to better understand and explain the research problem. Examples of information being viewed include books, journal articles, online data sources and webpages of firms *(Ghauri & Grønhaug, 2005).* In this proposal, the secondary data collects mainly from the internet. The researcher have gathers the secondary data from the official website of the ESLSE and some other related websites. The e-news papers, e-journals and e-books have also been uses to collect data.

3.6 Sample of the Study and Instrument

The population of the study encompasses Customer of the ESLSE, IT and logistics and SCM department including head, experts and head of departments like IT, logistics, transportation, warehousing and distribution areas in the organizations and customers of ESLSE. The population is 160 and as per the sampling method states below, the sample size is 108. The sampling method that is uses is purposive sampling in order to get appropriate data from employees directly related with the IT, logistics and SCM because the data that can be gathers from those people is helpful to get first hand information about the role that the IT plays in the day to day operation of the logistics and SCM activities.

Sample size determination formula

n=N/1+N (e) 2

Where n is number of respondents

N stands for total population

e stands for error term of 5%

Source Yemane(1967)

3.7 Method of Data Analysis

According to Yin, the most important strategy is to follow the theoretical propositions or hypotheses that led to the case study. In other words, such propositions can help the analyst plan and focus on the most relevant data, organize the entire case study, and define alternative explanations. In the absence of any propositions/hypotheses, an alternative is to develop a descriptive framework (e.g., a draft table of contents) for organizing the case study, while not pre-empting outcomes before the data has been fully analyzed. Such a framework can help the analyst with organizing the data as well as with developing a story line. In addition, there are five analytical techniques that can be used to analyze the case study evidence: pattern matching, explanation building, time-series analysis, logic models, and cross-case analysis *(Yin, 2003).*

Explanation building aims to analyze the case study data by building an explanation about the case. In this context, explaining refers to the process of building a set of causal links about how or why something happens. The process is usually iterative and involves making initial predictions, and comparing them against the case study evidence. Then, based on any variances, the initial predictions are revised and compared against additional evidence and/or cases. The procedure is mainly relevant to explanatory case studies *(Yin, 2003).*

The study would be employed regression analysis method since it uses to capture a cause and result relationship model. That means well-organize IT system would positively contribute to logistics and SCM performance. Those factors that affect IT system are organizing and calculate their regression on IT performance and logistics and SCM as well. In order to see IT practice of the enterprise, descriptive statistics is employee.

3.8 Validity and Reliability

The researcher would assured and considered the following points in his procedure in order to meet the requirements of the objectives of this study.

According to (Bryman and Bell, 2007), reliability analysis is concerned with the internal consistency of the research instrument. As multiple items in all constructs were used, the internal consistency/reliabilities of Information Technology practices, role of Information Technology, and logistics and SCM performance were assessed with Cronbach‘s Alpha and the reliability values for all constructs are confirmed as greater than 0.7, which are considered acceptable (Nunnally, 1978). The following table shows the summary of reliabilities of all constructs.

Table 3.1 Reliability test

IT Provides logistics and SCM efficiency	.765
IT systems timely delivery and safety satisfy customer	.784
The company reaches economies of scale and economies of distance to reduce cost	.785
IT service of our company is flexible	.795
IT service of our company is cost efficient	.772
The overall quality of our IT is very high	.771
Our IT cost is competitive in comparison with the market	.785
Our IT service gives quick response to special requests	.775

Employee Performance	.793
Employee Negligence	.793
Inadequate Training	.784
Lack of understanding team work	.810
sufficient and modern IT equipment	.784
Substandard networks	.796
Infrastructure Problem	.802
Missed Schedule	.790
Higher rate of loss and damage IT equipments	.776
Excessive up loading and downloading data storage time	.776
Electric power problem	.781

Our company IT is efficient in services and information's	.863
Using IT as a means of storage is a common practice in our company	.727
Our IT service deliver input at the right time	.704
Our IT security policies and procedures at any time	.710
Our IT system recovery and disaster recovery plan	.759

3.9 Ethical Considerations

In the context of research, ethics refers to appropriateness of researchers' behavior which related to the rights of those who are the study subjects, or those who are affected by the study or results. Researchers need to consider ethical issues throughout the research process and remain sensitive to the impact of the study and its results on those who participate and supporters to the study (Saunders et al. 2003).

Research as any other human activity can involve direct (or indirect) fraud, lies and wrong-doing. Misconduct in science has serious consequences. Therefore, normative guidelines and a code of ethics and rules are needed in order for academic institutions and organizations to monitor the integrity of science endeavors and to create ways to handle mistakes (Eriksson & Kovalainen 2008).

As a part of consideration to ethical issues, the respondents in this study given the right either to participate or not. The researcher explained the purpose of the study and considered confidentiality by not sharing the names of respondents. In addition, there was no compensation to be paid for any of the participants and the researcher has no conflict of interest with the findings of the research.

Chapter Four

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1. Introduction

This chapter presents the data analysis, the research findings (results), and based on the results the researcher gives discussion on the findings and also gives some interpretation of the result. In order to presents findings and the discussion about the role of Information Technology in logistics and Supply chain management performance of ESLSE; the researcher uses different form of tables and figures and qualitative analysis is done.

4.2. Response Rate

For data collection purpose, depending on sample of the study, a total of 108 questionnaires were distributed to respondents and 86 of them are collected but from the collected questionnaire 4 of them are not fit for analysis as a result of incompleteness the total questionnaire used for analysis is 82. Therefore the response rate stood at 76 percent which show the response rate is acceptable for analysis.

4.3. General Information

4.3.1 Respondents Gender

Table 4.1. Gender of Respondents

		Frequency	Percent
Valid	F	30	36.6
	M	52	63.4
	Total	82	100.0

Source survey 2018

The table above shows sex composition of respondents that participated in filling questionnaires. As per the result, from the total respondents, 52(63.4%) of them are Male while the remaining 30(36.6) are Female employee of the enterprise.

4.3.2. Educational Background of Respondents

Table 4.2. Educational Background of respondents

		Frequency	Percent
Valid	High school Complete	3	3.66
	Diploma	5	6.09
	Degree	52	63.41
	Masters	14	17.07
	Others	8	9.76
	Total	82	100.0

Source survey 2018

Table 4.2.Above shows educational background of respondents. From the total respondents, 3(3.66%), 5(6.09%), 52(63.41%) are High school complete, Diploma and Degree holders respectively while educational background of the remaining 14(17.07%) and 8(9.76%) are Masters and others respectively.

4.3.3 Work Experience of Respondents

Table 4.3. Work Experience

		Frequency	Percent
Valid	0-5 years	9	10.97
	5-10 years	23	28.04
	10-15 years	27	32.92
	above 15 years	23	28.04
	Total	82	100.0

Source survey 2018

Respondents of the questionnaire served the company for different period of time as per the result depicted in the table above. From the total respondents, 9(10.97%) of them are with the company for five years and below, 23(28.04%) fall in between six to ten years of service, 27(32.92%) are with the company for above eleven years to fifteen years and the remaining 23(28.04%) are in service of the company for above fifteen years. It is possible to state that majority of the respondents are with the company for a long period of time which means they know the company very well from which it is possible to get the required information for the study.

4.4. Descriptive Statistics for IT Practice and Factors Affecting logistics and SCM Performance

4.4.1. IT Practice

Table 4.4. Information Technology practice

	N	Mean	Std. Dev.
IT provides logistics and SCM efficiency	82	4.44	.704
IT systems timely delivery and safety satisfy customers	82	4.17	.717
IT service of our company is flexible	82	2.26	.991
IT service of our company is cost efficient	82	2.38	.951
The overall quality of our IT system is very high	82	2.40	.829
Our IT costs is competitive in comparison with the market	82	4.28	.653
Our IT service gives quick response to special requests	82	2.24	1.072
Valid N (list wise)	82		

Source survey 2018

In table 4.4, it is sought to see what Information technology practice of the company looks like in order to do that , the respondents were requested to respond to the statements on a 5 point Likert scale and indicate the extent they agree with the statements that is: 5-Strongly agree, 4-Agree, 3-Nutral, 2-Disagree, 1-Strongly disagree. A mean (M) score of 0-1.5 means that the respondents strongly disagreed, between 1.51 to 2.50 means they disagreed, 2.51 to 3.50 means the respondents were neutral, 3.51-4.50 means they agreed, and a mean above 4.51 means the respondents strongly agreed. As per the response from respondents, as per the result above, the result shows that practices of the company like Information Technology provides logistics and SCM efficiency, As per the response from respondents, the result shows that practices of the company like Information Technology provides logistics and SCM efficiency, Information Technology systems timely delivery and safety satisfy customer, and our Information Technology cost systems is competitive in comparison with the market have a mean square value

of 4.44, 4.17, 4.06 and 4.28 respectively showing that Information Technology is providing logistics and SCM efficiency by playing the roles of supply chain integration, customer service delivery system and security and tracking. Information Technology increases customer satisfaction by timely and safe delivery of product, good service quality to the customer which is supported by 4.17 mean square value meaning respondents agree on the role of Information Technology in the company for timely delivery and safety. Unlike the above practices, Information Technology service flexibility, Information Technology service cost efficiency, the overall quality of Information Technology and Information Technology services quick response to special requests in the company with mean value of 2.26, 2.38, 2.4, and 2.24 respectively, the respondents disagreed with the practice of the company. It shows that Information Technology service lacks flexibility with mean and st.dev of (2.26 and .991), the Information Technology service is consuming much cost with mean of (2.38, .951) and the respondents also disagree with the existence of quality Information Technology service in the company with mean 2.4 and st dev .829 and also they disagree with the speed within which the company gives responses to special requests with mean and st.dev of 2.24 and 1.027.

The above finding shows that Ethiopian Shipping and Logistics Service Enterprise (ESLSE**)** has to identified areas of Information Technology practice like Information Technology flexibility, Information Technology systems cost and the time it takes to reply to special inquiry and work on those dimensions in order to improve the Information Technology which in turn improves the overall logistics and SCM efficiency resulting in improved organizational performance.

Table 4.5 Human factors affecting information technology Performance

Question items	Frequencies		Percent	Total	Mean	Std. Dev
1.Employee Performance	Very Low	-		100%	4.04	0.733
	Low	-				
	Moderate	16	19.5			
	High	47	57.3			
	Very High	29	23.2			
2. Employee Negligence	Very low			100%	3.94	0.743
	Low	12	14.6			
	Moderate	33	40.2			
	High	32	39.0			
	Very High	5	6.1			
3.Inadequate Training	Very low	-				
	Low	2	2.4			
	Moderate	18	22.0			

	High	50	61.0			
	Very High	12	14.6	100%	4.02	0.566
4. Lack of understanding Team Work	Very low	-				
	Low	1	1.2			
	Moderate	24	29.3			
	High	55	67.1			
	Very High	2	2.4	100%	4.06	0.673

Source Survey 2018

In table 4.4, it is sought to see the Human factors affecting Information Technology performance of the company, the respondents were requested to respond to the statements on a 5 point Likert scale and indicate the extent they agree with the statements that is: 5-Strongly agree, 4-Agree, 3-Neutral, 2-Disagree, 1-Strongly disagree. A mean (M) score of 0-1.5 means that the respondents strongly disagreed, between 1.51 to 2.50 means they disagreed, 2.51 to 3.50 means the respondents were neutral, 3.51-4.50 means they agreed and mean of above 4.51 is strongly agree. As per the response of respondents, all of the factors stated as human factors affecting Information Technology performance of the company are affecting the day to day operation of Information Technology in the company, employee performance with mean of (4.04) shows that employee performance in the company have a problem in order to benefit from excellent

performance of the man power. Employee negligence with mean of (3.94) stated by respondents there exist negligence of some employees in the company which have an effect in the smooth operation of the Information Technology activity. The is also inadequate training with mean of (4.02) and Lack of understanding team work with mean of (4.06) is explained as the other human factor affecting Information Technology operation of the ESLSE.

Table 4.6 Non Human factors affecting Information Technology performance

Factors	Frequencies		Percent	Total	Mean	Std. Dev
1. Lack of sufficient and Modern IT equipment	Very Low					
	Low	5	6.1			
	Moderate	50	61.0			
	High	24	29.3			
	Very High	3	3.7	100%	3.84	0.853
2. Substandard Network	Very low	16	19.5			
	Low	20	24.4			
	Moderate	37	45.1			
	High	5	6.1			
	Very High	4	4.9	100%	3.79	0.813
3. Infrastructure problem	Very low					
	Low	20	24.4			
	Moderate	55	67.1			
	High	7	8.5			
	Very High			100%	3.98	0.867
	Very low					

4. Missed schedule	Low	2	2.4			
	Moderate	11	13.4			
	High	59	72.0			
	Very High	10	12.2	100%	4.1	0.713
5. Higher rate of loss and damage of IT equipments	Very low					
	Low					
	Moderate	31	37.8			
	High	45	54.9			
	Very High	6	7.3	100%	4.00	0.786
6. Excessive uploading and downloading time data storage	Very low					
	Low	4	4.9			
	Moderate	21	25.6			
	High	48	58.5			
	Very High	9	11.0	100%	3.88	0.792
7. Electric power problem	Very low			100%	3.87	0.798

Source survey 2018

In table 4.6, it is meant to see the Non human factors affecting Information Technology operation of the company to do that , the respondents were requested to respond to the statements on a 5 point Likert scale and indicate the extent they agree with the statements that is: 5-Strongly agree, 4-Agree, 3-Nutral, 2-Disagree, 1-Strongly disagree. As it is depicted in the above table, the respondents agree on the existence of non human factors that affect Information Technology operation of the company with mean of (3.84) lack of Lack sufficient and Modern IT equipment

is stated as one of the problem. There is also Substandard Network in the company as respondents agree with a mean of (3.79) there also exists an infrastructure problem in the company related with transportation as per respondents response having a mean of (3.98).There is also missed schedules with mean of (4.10.)

The existence of the non human factors stated above would hamper the smooth operation of Information Technology operation. Especially lack of availability of substandard Network, lack of modern IT equipments and IT infrastructure problems significantly determine performance of the Information Technology service coupled with the human factors mentioned earlier as most of the operation of the ESLSE is dependent on Information Technology.

4.5. Inferential Statistics for Information Technology Role and Logistics and SCM Performance

4.5.1. Correlation Analysis

To identify the relationship between role of Information Technology and logistics and SCM performance, correlation analysis is employed. The role Information Technology plays Integration, (customer service delivery system and security and tracking) is taken as the independent variable and logistics and SCM performance is considered as the dependent variable the indicators for logistics and SCM performance are logistics and SCM effectiveness, efficiency and differentiation.

Correlations are the measure of the linear relationship between two variables. A correlation coefficient has a value ranging from -1 to 1. Values that are closer to the absolute value of 1 indicate that there is a strong relationship between the variables being correlated whereas values closer to 0 indicates that there is little or no linear relationship.

As described by Andy (2006), the correlation is a commonly used measure of the size of an effect: values of ± 0.1represent a small effect, ± 0.3 is a medium effect and ± 0.5 is a large effect. In this section, correlation analysis conducted in the light of each research Objectives and questions developed. The relationship between role of Information Technology and Logistics and SCM performance was investigated using correlation analysis. This provides correlation Coefficients which indicate the strength and direction of relationship. The p-value also indicates the probability of this relationship‘s significance.

4.5.2. Correlation analysis between dimensions of role of information technology and logistics and scm performance indicators

To test relationship between the dependent variable-logistics and SCM performance with dimensions of Logistics and SCM performance indicators differentiation, Logistics and SCM efficiency and logistics and SCM effectiveness with the independent variable which is Information Technology efficiency in services and information, practice of using Information Technology as a data storage facility, providing inputs timely, delivering services to customers timely, delivery accuracy in respect of place and timely delivery of services to customers. The finding of the analysis is clearly depicted below.

Table 4.7 Correlation Analysis between Dimensions of role of Information Technology and Logistics and SCM performance indicators

		Efficiency in Different services and information	Using IT roles	Timely delivery of services	On time Service delivery	Logistics and SCM Differentiation	Logistics and SCM Efficiency	Logistics and SCM Effectiveness
Efficiency in Different Service and information	Pearson Correlation	1	.385**	.217*	.082	.165	.239*	.249*
	Sig. (2-tailed)		.000	.050	.463	.139	.030	.024
	N	82	82	82	82	82	82	82
Customer service	Pearson Correlation	.385**	1	.639**	.457**	.704**	.764**	.780**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000
	N	82	82	82	82	82	82	82
Timely delivery of input	Pearson Correlation	.217*	.639**	1	.591**	.814**	.801**	.887**
	Sig. (2-tailed)	.050	.000		.000	.000	.000	.000
	N	82	82	82	82	82	82	82
Security and tracking	Pearson Correlation	.173	.568**	.754**	.658**	.785**	.606**	.889**
	Sig. (2-tailed)	.120	.000	.000	.000	.000	.000	.000
	N	82	82	82	82	82	82	82
On time service delivery	Pearson Correlation	.082	.457**	.591**	1	.780**	.550**	.810**
	Sig. (2-tailed)	.463	.000	.000		.000	.000	.000
	N	82	82	82	82	82	82	82

Logistics and SCM Differentiation	Pearson Correlation	.165	.704**	.814**	.780**	1	.917**	.916**
	Sig. (2-tailed)	.139	.000	.000	.000		.000	.000
	N	82	82	82	82	82	82	82
Logistics and SCM Efficiency	Pearson Correlation	.239*	.764**	.801**	.550**	.917**	1	.804**
	Sig. (2-tailed)	.030	.000	.000	.000	.000		.000
	N	82	82	82	82	82	82	82
Logistics and SCM Effectiveness	Pearson Correlation	.249*	.780**	.887**	.810**	.916**	.804**	1
	Sig. (2-tailed)	.024	.000	.000	.000	.000	.000	
	N	82	82	82	82	82	82	82

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

*. Correlation is significant at the 0.05 level (2-tailed).

The correlation between dimensions of Information Technology role and logistics and SCM performance indicators was run as seen in the above table. The result of correlation matrix between dimension and logistics and SCM performance are analyzed as follow:

As it is shown in the table 4.7 above, storage role of Information Technology is positively related to indicators of logistics and SCM performance of logistics differentiation with a Pearson correlation coefficient of 0.704 (r=0.704) and significance value is less than 0.001, logistics and SCM efficiency with a Pearson correlation coefficient of .764 and logistics and SCM

effectiveness with a Pearson correlation coefficient of .780 and significance value of less than 0.001. This significance tells that there is strong relationship between storage role of Information Technology and logistics and SCM performance dimensions of logistics and SCM differentiation, efficiency and effectiveness.

It is also shown in the table above; the other role of Information Technology creating time utility is positively related with logistics and SCM performance dimensions of Logistics and SCM differentiation with Pearson coefficient of .814, with logistics efficiency with Pearson coefficient of .801 and with logistics and SCM effectiveness with Pearson coefficient of .887 with significance of less than .001 in all the three cases. This significance tells that there is a strong and genuine relationship between Information Technology role of creating on time service delivery and logistics and SCM performance dimensions of differentiation, efficiency and effectiveness.

The other roles that Information Technology creates are security and tracking by security policies and procedures in place at any time. In this regard, Information Technology role of security and tracking is positively related with logistics and SCM performance dimensions of Differentiation, Efficiency and effectiveness with Pearson coefficient of .785, .550 and .810 respectively with significance level of less than.001 in all the three correlations.

4.5.3. Correlation analysis between information technology practice and logistics and scm performance

Table 4.8 correlation analysis between Information Technology practice and logistics and SCM performance Correlations

		Information Technology practice	Logistics and SCM performance
Information Technology practice	Pearson Correlation	1	.465**
	Sig. (2-tailed)		.000
	N	82	82
Logistics and SCM performance	Pearson Correlation	.465**	1
	Sig. (2-tailed)	.000	
	N	82	82

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

Source survey 2018

The correlation run test conducted in the above table to show correlation in between Information Technology practice and logistics and SCM performance shows significant but moderate

relationship with Pearson coefficient of .465 and significance level of 0.00 which is less than 0.001.

4.5.4. Correlation between Information Technology role and logistics and SCM Performance

Table 4.9. Correlation between Information technology role and Logistics and SCM performance correlation

		IT Role	Logistics and SCM performance
IT Role	Pearson Correlation	1	.925**
	Sig. (2-tailed)		.000
	N	82	82
Logistics and SCM Performance	Pearson Correlation	.925**	1
	Sig. (2-tailed)	.000	
	N	82	82

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

Source survey 2018

Table 4.9 shows the result of correlation run between Information Technology performance and logistics and SCM performance. As a result of the correlation run, there is a very strong

positive relationship between Information Technology role and logistics and SCM performance with Pearson coefficient of correlation of .925 with significance of .000 which is less than .001.

4.6. Regression Analysis

As it is stated in bold in the literature part of the paper, Information Technology plays a great role in the logistics and SCM and to have an efficient logistics and SCM performance, and it is must to have a strong Information Technology service in the any company. To prove this and determine the variation in logistics and SCM as a result of Information Technology, a regression analysis is conducted.

4.6.1. Regression analysis between role of Information Technology and logistics and SCM Performance

Table 4.10 model summary for dependent variable Logistics and SCM performance

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.925[a]	.855	.853	2.65385	1.849

a. Predictors: (Constant), Information technology role

b. Dependent Variable: Logistics and SCM

Performance Source survey 2018

From table 4.10 R-Square which is the coefficient of determination is a commonly used statistics to evaluate model fitness. The adjusted R square also called the coefficient of multiple determination, is the percentage of the variation in the dependent variable explained uniquely or jointly by the independent variable. As per the adjusted R square result in the table above, 85.3 percent of variation in Logistics and SCM performance of ESLSE can be attributed to effect of

predictor variable which is Information Technology role. This means, 14.7 percent changes in logistics and SCM performance can be attributed to other factors while 85.3 percent of the variation in logistics and SCM performance is as a result of the role that Information Technology plays in the logistics and Supply chain management.

4.6.2. Regression analysis between logistics and SCM performance and dimensions of Logistics and SCM performance

Table 4.11 Regression coefficients for logistics and SCM performance and for predictor variable

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.791	1.311		2.892	.005
Logistics and SCM Differentiation	-.079	.148	-.036	-.538	.592
Logistics and SCM Efficiency	1.406	.186	.342	7.575	.000
Logistics and SCM Effectiveness	1.934	.120	.727	16.170	.000

a. Dependent Variable: Logistics and SCM performance *Source SPSS output (2018)*

Table 4.11 shows that there exists significant association between the independent variables Logistics and SCM efficiency and logistics and SCM effectiveness and the

dependent variable logistics and SCM performance of ESLSE, since the p-value of those logistics and SCM performance dimensions are less than 0.05.

Table 4.12 Model summary for dependent variable logistics and SCM performance for Predictor variable dimensions of logistics and SCM performance

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.988[a]	.476	.475	1.09331	1.790

a. Predictors: (Constant), Logistics and SCM Effectiveness, Logistics and SCM Efficiency, Logistics and SCM Differentiation

b. Dependent Variable: Logistics and SCM performance

Source survey 2018

The findings from table 4.12, the adjusted R Square, imply that 47.6 percent of the variation in Logistics and SCM Performance of the ESLSE can be attributed to the combined effect of predictor variable (Logistics and SCM Effectiveness, Logistics and SCM Efficiency, Logistics and SCM Differentiation). That means 52.4 percent of changes in the logistics and SCM performance is attributed to other factors.

4.6.3 Regression analysis between Information technology practice and Role of Information Technology

Table 4.13 Regression coefficient for role of Information Technology

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	8.817	2.142		4.117	.000
	IT Practice	.370	.070	.507	5.267	.000

a. Dependent Variable: Role of Information Technology

Source survey 2018

Table 4.13 shows there exists significant association between the Information technology role and the IT practice of ESLSE; since p-value for IT practice is less than 0.05. It is to mean that by taking all other factors at constant zero, a unit increase in IT practice results in a 37 percent increase in role that IT plays in the logistics and SCM.

Table 4.14 Model summary for dependent variable role of Information technology

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.507[a]	.257	.248	2.54899	1.737

a. Predictors: (Constant), Information Technology practice

b. Dependent Variable: Role of Information Technology

Source Survey 2018

The adjusted R Square in table 4.14 shows that 24.8 percent of the variations in role of IT are as a result of the predictor IT practices and the remaining 75.2 percent is as a result of some other factors.

Table 4.15 Regression coefficient for role of Information Technology of ESLSE

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	31.154	5.184		6.010	.000
	IT practice	.800	.170	.465	4.702	.000

Dependent Variable: Logistics and SCM Performance

Source Survey 2018

The result in table 4.15 shows that there is significant association between the independent variable Information Technology practice and logistics and SCM performance as p-value for IT practice is less than 0.05.

Table 4.16 model summary for Information Technology practice

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.465[a]	.217	.207	6.16883	1.561

a. Predictors: (Constant), Information Technology practice
b. Dependent Variable: Logistics and SCM performance

Source Survey 2018

The adjusted R Square in table 4.16 shows that 20.7% of variation in logistics and SCM performance is related with the Information Technology practice with the remaining of 79.30% resulting from other factors.

4.7. Discussion of Results

The objective of the study is to examine the role of Information Technology in logistics and SCM performance with specific objectives of analyzing Information Technology practice and identifying Information Technology related problems specific to Ethiopian Shipping and Logistics Service Enterprise (ESLSE). Literature has suggested that logistics and SCM performance is dependent up on Information Technology service at each and every stage of operation. The study will contribute by exploring the relationship between Information

Technology role and logistics and SCM while showing factors affecting smooth operation of Information Technology at the same time. In order to do that, the results are discussed here below.

Information Technology practice of the company is analyzed using descriptive statistics. The findings reveal that Information Technology provides logistics and SCM efficiency with a mean of 4.44 (St Dev .704). This shows that Information Technology operation of the company is providing logistics and SCM efficiency even though there are factors affecting the smooth operation which will be discussed in the later part of the discussion. Safety and timely delivery of services increases customer satisfaction as it is supported by respondents with mean of 4.17 St Dev 0.717.

On the other end, flexibility of Information Technology operation in ESLSE is not supported by majority of respondents with mean of 2.26 St.Dev.991 his shows that Information Technology practice lacks flexibility. Quality of Information Technology service and the speed of reply to special enquiry is not the practice in the company with mean of 2.4 and 2.224 respectively showing that quality is compromised. Quality of Information Technology is in question means the whole operation of logistics and SCM is at risk as the whole operation of logistics and SCM starting from raw material delivery to distribution of finished goods to the market is dependent on Information Technology now a day.

The factors that affect Information Technology are divided in to two as human and non human factors. From the non human factors that are affecting Information Technology operation of the company are employee performance, employee negligence, inadequate training and lack of understanding team work are described as existing problem in the company.

Information Technology is also being affected by non human factors of Sufficient and Modern IT equipments, Substandard Network, Infrastructure problems, Missed schedules, higher rate of loss and damage IT equipments, Excessive uploading and downloading time data storage, Electric power problems in anywhere like Addis Ababa are among the non human factors that affect Information Technology in the Ethiopian Shipping and Logistics Service Enterprise (ESLSE).

Correlation result between Information Technology role and dimensions of logistics and SCM chain performance is conducted in order to see the degree of association between the constructs. As per the result there is a significant association in between storage role of Information Technology and all the three dimensions of logistics and SCM performance of differentiation with Pearson coefficient of.704, with logistics and SCM efficiency having .746 Pearson coefficients and with coefficient of .780 with logistics and SCM effectiveness.

Information Technology role of creating time utility also have a strong association with differentiation, efficiency and effectiveness with Pearson coefficient of .814, .801 and .887 for time utility and .785, .550 and .810 for any integrated utility respectively.

There is a moderate but significant association between Information Technology practice and logistics and SCM performance of Ethiopian Shipping and Logistics Service Enterprise (ESLSE) which also supports the literature that a good Information Technology service reduces uncertainty and level of inventory holding. The two factors Information Technology practice and logistics and SCM performance have Pearson coefficient of .465 and significance level of below 0.001.

Dimensions of logistics and SCM performance (Logistics and SCM differentiation, Logistics and SCM efficiency and Logistics and SCM effectiveness) determines 97.5% of the variation in logistics and SCM performance which indicates working on those dimensions of logistics and SCM performance dimensions is at the heart of every logistician.

Information Technology practice effect on Information Technology role is also regressed in order to see what percentage of Information Technology role is in the control of Information Technology practice as a result with R Square of .248, variation in Information Technology role is attributed to 24.8% of Information Technology practice.

As the ultimate objective of the paper is examining and bringing to the attention of the company as well as all stakeholders (MCIT, INSA and etc), the association between role of Information Technology and logistics and SCM performance is very strong with Pearson coefficient of .925 and significance level of .000.

4.8. Summary of Interview

As per the interview conducted, with different employees of the company in the logistics and SCM department, the role that Information Technology plays is inevitable. Almost every activity is dependent on logistics and SCM operation. Even if the positive contribution of Information Technology is supported by them, there are problems related with Information Technology that hinders the smooth operation. Some of the problems are related with the human factors like employee performance, negligence and the like but the main problems raise are new infrastructure problems and the network problems are the main ones. Even if there are problems the contribution of Information Technology is rated as the core activity in the logistics and SCM of the company which is supported by the finding of the paper.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1. Conclusions

Based on the result of summary findings,

- There are human factors employee negligence, employee performance, inadequate training and lack of understanding team work.

- IT service of ELSE is providing logistics and SCM efficiency despite the problems of human and non human.

- IT services of the company is not flexible as supported by majority of respondents which shows lack of flexibility in technology operation of ESLSE.

- The IT practice is also not cost efficient as per respondents 'response.

- The IT service is also not giving timely reply to special enquiry from customers.

- The non human that sufficient and modern IT equipments, substandard network infrastructure, electric power problems, and higher rate of loss and damage IT equipments, excessive uploading and downloading time data storage are the main ones.

- There is a strong and positive relationship between IT practice and role of IT with logistics and SCM performance.

- The relationship between IT (the role IT plays) and logistics and SCM performance is very strong and positive. It shows that role of IT have a strong influence on logistics and SCM performance.

5.2. Recommendations

Based on the overall findings and conclusions made, the under listed recommendations are made.

- To improve Information Technology performance and enhance its role on logistics and SCM performance, the ESLSE needs to look in to human factors like employee performance, negligence, inadequate training and lack of understanding teamwork.

- The ESLSE also needs to avoid or keep to a minimum the non human factors (lack of sufficient and modern IT equipments, substandard network infrastructure, electric power problems, and higher rate of loss and damage IT equipments, excessive loading and unloading time to data storage) that are hindering the smooth operation of different Information Technology activities.
- The ESLSE has to work on IT flexibility in order to serve different segment of the market.

- To cultivate the benefits of logistics and SCM performance, the ESLSE has to give due emphasis to IT practice as IT accounts for about services costs which will support the ESLSE‘s objective of benefiting from economies of scale and their service quality.
- To increase organizational performance, it is better for the organization to give due attention to logistics and SCM performance as more and more of their operation is supported by different Information Technology systems.

5.3 Implication for further study

It should be noted that IT is not the only factor that influence logistics and SCM performance but there are chain activities like procurement, property, warehousing, distribution and also the relation of logistics and SCM with other operation of the ESLSE like marketing, production, finance and the like all have a say on the performance of logistics and SCM operation even if the major one is to increase IT systems. Performance of logistics and SCM is not dependent only on IT. Therefore, the implication for further study is to include all other dimensions including the influence from other departments in the company in order to have a full picture of factors having significant role on performance of logistics and SCM.

In order to be more accurate of IT role, it will also be an interest to conduct the study on different companies at a time especially in company's works on logistics and SCM. Integration as their operation is largely IT dependent.

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Appendix

Dear all Subject:

This questionnaire is prepared to collect data from the respondents in order to assess the role of Information Technology in logistics and SCM performance in the **Ethiopian Shipping and Logistics Service Enterprise (ESLSE)**. I am a student of Addis Ababa University School of Commerce in Department of Logistics and Supply Chain Management. First of all I would like to forward my heartfelt gratitude and respect to you for administering this questionnaire honestly and responsibly. The questionnaire is designed to collect the necessary information to undertake a research on the topic **"The Role of Information Technology in Logistics and SCM performance the case of Ethiopian Shipping and Logistics Service Enterprise (ESLSE)** for the partial fulfillment of the requirement of the degree of Masters of Logistics and Supply Chain Management. The information that you provide will remain confidential and will be used for the purpose of this research only. For any further enquiry please use the address below.

Email: yymmk12@hotmail.com or mobile phone 0910 43 13 50

Thank you in advance for your cooperation

Questionnaire

Please give answers in the spaces provided and tick in the box that matches your response to the questions where applicable.

Part One-Respondents profile

1. Sex Male---------- Female----------

2. Educational Background: - Diploma------ Degree --- Masters ----other please specify-----

3. Years of experience in the company: 1-5 ____, 6-10 ____, 11-15 ___, ≥15 ____

Part two – Questions related to IT practice

1. Practice or systems of information technology provides efficiency in logistics.

Strongly agree □ Agree □ neither agree nor disagree □ Disagree □ strongly disagree □

2. IT systems timely delivery and safety satisfy your customer

Strongly agree □Agree□ neither agree nor disagree□ Disagree □ strongly disagree□

3. The company reaches economies of scale and economies of to reduce cost

Strongly agree□ Agree □ neither agree nor disagree □Disagree □strongly disagree□

4. IT service of our company is flexible

Strongly agree□ Agree □ neither agree nor disagree □Disagree □strongly disagree□

5. Our IT service is cost efficient

Strongly agree□ Agree □ neither agree nor disagree □Disagree □strongly disagree□

6. The overall quality of our IT is very high

Strongly agree□ Agree □ neither agree nor disagree □Disagree □strongly disagree□

7. Our IT service is competitive in comparison with the market.

Strongly agree□ Agree □ neither agree nor disagree □Disagree □strongly disagree□

8. Our IT service gives quick response to special requests

Strongly agree□ Agree □ neither agree nor disagree □ Disagree □strongly disagree□

Part three – Questions related to IT practice Challenges

I. Human factor challenges affecting IT practice

Human factor challenges stated below are believed to affect Information Technology performance operation. Please show their degree of effect on IT operation of your company.

Challenges	Rating				
	Very low	Low	Moderate	High	Very High
	1	2	3	4	5
Employee performance					
Employee negligence					
Inadequate training					
Lack of understanding team work					

II. Non-human factors challenges affecting Information technology practice

Non-human factor challenges stated below are believed to affect Information Technology performance operation. Please show their degree of effect on IT operation of your company

Challenges	Rating				
	Very low	Low	Moderate	High	Very High
	1	2	3	4	5
Sufficient and Modern IT equipments					
Substandard Network					
Infrastructure problems					
Missed schedules					
Higher rate of loss and damage IT equipments					
Excessive uploading and downloading data storage time					
Electric power problems					

Part four – Questions related to Information Technology Role

The under listed items are meant to measure role of Information Technology in your company. Therefore please put the sign to show your answer

IT Role	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	1	2	3	4	5
1.Integration					
Your company‘s IT is efficient in different services and information					
2.customer service					
Using IT as a means of is a common practice in your company					
Your IT service deliver services to customers on time					
3.Security and Tracking					
Are documented IT security policies and procedures in place at any time					
Your IT systems support your company's critical business functions					
Your IT systems recover IT functions and disaster recovery Plan					

Part five – Questions related to three dimensions of Logistics and SCM Performance

I. Logistics and SCM Differentiation

The under listed items are asked to measure how different is your logistics and ACM operation from other Competitors in the industry.
Therefore please put the sign /√/ on the appropriate answer.

Logistics and SCM Differentiation	Rating				
	Far below competitors	Below competitors	Neutral	Above competitors	Far above competitors
	1	2	3	4	5
Percentage of Damage free deliveries					
Stock of finished goods inventory					
Forecasting accuracy					
Lead time(time between order and delivery)					
Percentage of on time delivery					
Time it takes on backorder					
Total inventory					
Percentage of Damage free deliveries					

II. Logistics and SCM Efficiency

The under listed items are asked to measure efficiency of logistics and SCM operation of the company.
Therefore, please answer the questions by putting the sign/√/ on the rating provided.

Logistics and SCM Efficiency	Very poor	poor	Neutral	Good	Very Good
	1	2	3	4	5
Average order cycle time (time in between asking and service delivery)					
Number of IT services on time					
Customer service level relating to customer satisfactions					
Inventory level					

III. Logistics and SCM Effectiveness

The under listed items are asked to measure effectiveness of logistics and SCM operation of the company.

Therefore, please answer the questions by putting the sign/√/ on the ratings provided.

Logistics and SCM Effectiveness	Rating				
	Much worse	Worse	neutral	Better	Much better
	1	2	3	4	5
Cost of raw material					
Revenue from service sold					
Inventory holding costs					
Transportation costs					