



ADDIS ABABA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

SCHOOL OF COMMERCE

DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT

**THE EFFECT OF TECHNOLOGICAL ADVANCEMENT ON LOGISTICS
PERFORMANCE; THE CASE OF ETHIOPIAN SHIPPING AND LOGISTICS
SERVICE ENTERPRISE (ESLSE)**

By: Amanuel Fikru

Advisor; Matiwos Ensurnu (PHD)

**A Thesis Submitted to the School of Commerce of Addis Ababa University
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**ADDIS ABABA UNIVERSITY
SCHOOL OF COMMERCE**

**The Effect of Technological Advancement on Logistics Performance: The
Case of the Ethiopian Shipping and Logistics Services Enterprise (ESLSE)**

Prepared by: Amanuel Fikru

Approved by a board of Examiners and Advisor:

_____	_____	_____
Advisor	Signature	Date
_____	_____	_____
Examiner	Signature	Date
_____	_____	_____
Examiner	Signature	Date

Declaration

I, Amanuel Fikru declare that this thesis is a result of my independent research work on the topic entitled “The Effect of Technological Advancement on Logistics performance: The case of The 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 School of commerce. This work is original in nature and has not been presented for a degree in any other University. All the references are also duly acknowledged.

Amanuel Fikru

Signature _____



Date July 03, 2023

Confirmation

This is to certify that Amanuel Fikru has carried out this thesis on the topic entitled “The Effect of Technological Advancement on Logistics performance: The case of The Ethiopian Shipping and Logistics Services Enterprise (ESLSE).”under my supervision. Accordingly, I here assure that his work is appropriate and standard enough to 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.

Dr. Matiws Ensurmu (PhD)

Signature_____

Date _____

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Acronym and Abbreviation

ASEAN- Association of Southeast Asian Nations

CEPT- Common Effective Preferential Tariff

CSP- Customer Service Policy

DESI- Digital Economy & Society Index

ERP- Enterprise Resource Planning

ESL- Ethiopian Shipping Lines

ESLSE- Ethiopian Shipping and Logistics Services Enterprise

EU- European Union

FDI- Foreign Direct Investment

ICT- Information & Computers Technology

IP&M- Inventory Planning & Management

IT- Inland Transport

ITF- International Transport Forum

LP- Logistics Performance

LPI- Logistics Performance Index

LSP-Logistics Service Provider

OP-Order Processing

OE-Order Entry

OTD-Order to Delivery

OTIF- On Time in Full

SCM- Supply Chain Management

SPSS- Statistical Package for the Social Science

SSP- Supplier Service Policy

TAC- Total Acquisition Cost

UK- United Kingdom

UNCTAD- United Nations Conference on Trade & Development

UNESCAP- United Nation Economic & Social Commission for Asia & the Pacific

VIF- Variance Inflation Factor

WMS- Warehouse Management System

Abstract

Applications of advanced automated technology in the maritime industry have become a vital part in the successful operation of its various activities. And this paper tries to see the outcome of technical advancement on logistics performance in the case of Ethiopian Shipping and Logistics Services Enterprise particularly in the Automation of system area. In order to compile the required information to conduct the research 83 questionnaires were prepared and submitted to the employees of ESLSE of which 78 of the respondents have filled and returned back the response. Pearson correlation was employed to assess the links indicated in the framework, and regression analysis was used to analyze the causal relationships. According to the findings of the investigation, there is a significant effect that applying advanced technology in various areas to maximize net profit, minimize overall cost, integrate shipping systems and improve cargo delivery time will have a positive relationship depending on how well the logistics capability of the company. And in the current logistics performance of ESLSE it is observed that majority of the employees have neutral or lower stance which shows efforts need to be exerted to improve the overall logistics of the company at this stand. Therefore, an improvement is needed on automating the system of the organization in order to improve the cargo delivery time by integrating the various shipping systems and avoiding unnecessary costs and eventually maximize the net profit so that better services are registered for the overall customer satisfaction.

Keyword: Automation, Net profit maximization, cost minimization, system integration, improved cargo delivery, logistics performance.

CHAPTER ONE

1. INTRODUCTION

Logistics is fundamental to countries like Ethiopia who aspire to grow their economy in a short period of time. And this study tries to see the effect of technological advancement especially on automation on the Ethiopian Shipping and Logistics Enterprise's logistical performance located in Addis Ababa who plays a critical role in the movement of majority of the consignments coming in and out of the country. In the 1980s; this decade signaled the start of a new era in supply chain solutions. When personal computers initially became widespread in the early 1980s, planners had much better computer access and could now plan in a new graphical environment. This gave rise to a wave of new technology, including adaptable spreadsheets and interfaces based on maps, which greatly improved logistics planning and execution technology. The fact that logistics was so widely acknowledged in the 1980s as being extremely expensive, crucial, and difficult was arguably the most important trend of the time. The company's executives realized that by investing in competent labor and cutting-edge technology, they could significantly enhance the bottom line in the logistics industry. 1990s; the advancement of Enterprise Resource Planning (ERP) systems in the 1990s further spurred the surge in logistics solutions. These aided in the integration of the various databases that existed in almost every firm but infrequently interacted with one another. This modification to ERP systems has a hugely positive impact on data availability and accuracy. Additionally, the globalization of manufacturing during this decade created a need for enhanced logistics strategies across countries (aka e-commerce). 2000s; there was a separation between two key notions as the supply chain grew increasingly intricate. The definition of "logistics" was a supply chain operation. (globaltranz.com/)

1.1. Background of the Study

According to Essex, (2019), Logistics is the process of coordinating and carrying out the effective storage and transit of commodities from their point of origin to their point of consumption. The goal of logistics is to provide timely and cost-effective client service. Logistics was originally responsible for moving military troops, supplies, and equipment. Despite its enduring military importance, the term logistics is now more commonly used to refer to the transportation of commercial commodities within the supply chain.

Before the 1950s, military terminology was used to describe logistics. It had to deal with the acquisition, upkeep, and transportation of equipment, manpower, and facilities for the military. Although some authors had begun to discuss the advantages of getting the right items at the right place at the right time for the company prior to this

Logistics and Supply Chain Thesis

time, such as transportation costs with inventory costs, the typical firm's organization around the operations today connected with logistics was scattered. At the time, logistics and distribution were not emphasized in educational courses or programs. They were mostly concerned with personal pursuits like travel and shopping. There was minimal effort made to integrate and balance the logistics-related operations that had competing costs and/or services. As a result, managers had limited opportunities to become familiar with the bigger ideas in logistics. Ballou (2007)

The Ethiopian Government established a new company, The Ethiopian Shipping and Logistics Services Enterprise (ESL for short), to enhance the country's shipping and logistics services. ESL is able to provide effective marine and land transportation services, as well as maritime and dry port services thanks to its extensive fleet ships, heavy-duty trucks, sea and dry port facilities, chicaneries, and so on. Djibouti, Modjo, and Kality (the former Comet) are the primary branches, as well as further branches in the towns of Mekelle, DireDawa, Kombolcha, Semera, and Gelan, ESL is headquartered in the heart of Addis Abeba, Ethiopia. Additionally, it has a maritime training institute in Bishoftu (formerly Debrezeit) Town at a location named Babogaya. (<https://www.eslse.et/overview.html>)

A supply chain includes all stakeholders involved in directly or indirectly fulfilling a consumer request. The supply chain includes transporters, warehouses, merchants, and even the real customers, in addition to the manufacturer and suppliers. Every firm, such as a manufacturing, has a supply chain that includes all operations involved in receiving and fulfilling a client request. Among these responsibilities are the development of new products, marketing, operations, distribution, financing, and customer service. Sunil & Peter (2013)

1.2.Statement of the Problem

In today's corporate world having effective logistics system is the make or break of a country's development. Being a developing country Ethiopia's logistics system plays an important part in the overall performance of businesses, government and non-government organizations. And managing this process in a more advanced manner will provide end users the necessary goods at the appropriate time and location so that the required conversions or distribution are done in an adequate manner without any disruption.

The goal of this research is to look at the effect of technological advancement on performance in logistics the case of Ethiopian Shipping and Logistics Enterprise (ESLSE) with a special focus on automation. Ethiopia as a land locked nation, it heavily relies on ESLSE's efficient and effective performance in bringing in and taking out

export consignments with minimum level of delay so that the Country's economy is supported with cost effective time bounded service so that on the global market, commerce can be fiercely competitive.

To be efficient and effective in the current global market, technologies plays a vital role in providing various benefits for shipping companies as well as their customers. Using its own and hired vessels, the company currently imports around 83% of the nation's seaborne general cargo, and it manages about 4,000 owned and 200 leased containers. Because the ships are chosen by the importers on the other side of the water, the corporation only exports a small portion of its cargo. Debela (2013). And as majority of Ethiopia's import and export goods are moved by ESLSE, it is vital for the shipping company to equip its self with the latest technologies in terms of online platforms for customers, online integration of shipping systems, digital platform to conduct routine and repetitive tasks without any paper works and the so much more, in order for customers to prefer the company to move their consignment without any hesitation.

It is observed that ESLSE insists they have improved technologies despite many institutes put them in the lower level in terms of technology usage especially in sharing real time information to customers so that they are able to see the performance in a clear manner with minimum draw backs and increased efficiency and effectiveness. The World Bank Logistics Performance Index 2016 claims that: trade and transportation infrastructure quality is given 2.12 (1low to 5 high) for Ethiopia. Even though ESLSE use various technologies to improve its services, much of the work done are still manual like getting instant binding offers, trace and track shipments, list all shipments, access the various tariffs involved, easily finding offices and dry ports map, and many others which the customer can self-serve. The above factors play key role in improving the logistics performance of the enterprise and in this study the involvement or effect of technological improvement is seen whether it play critical role in improving the overall logistics performance in terms of cost minimization, net profit maximization, better integration between shipping systems, and betterment of on time in full delivery of consignments.

The goal of this study is to investigate how technological development or improvements affect the efficiency in Ethiopian Shipping and Logistics Enterprise logistics performance while keeping in mind the aforementioned gaps. And it is observed there is a gap between the services provided by the company and customers in getting the right delivery at the right time without any obstacles or information delays, since most of the issues raised by the customers are these issues. Keeping these gaps in mind this study has focused on the automation advancement particularly since it tries to see how the improvements affect the logistics performance of the organization so that it is able to provide the best services for its customers and make them the best in the shipping industry.

1.3. Research Questions

These fundamental research queries are attempted to be answered by this work;

- What effect does technological advancement have in maximizing the net profit?
- What effect does technological advancement has in minimizing cost?
- What effect does technological advancement have in improving overall integration between the shipping systems?
- What effect does technological advancement have in improving cargo delivery time?

1.4. Objective of the Study

1.4.1. General Objective

The general objective is to examine the effect of technological advancement on logistics performance in ESLSE especially in the automation area.

1.4.2. Specific Objective

The following objectives are specific to the study;

- To assess the effect of technological advancement in maximizing the net profit in ESLSE.
- To assess the effect of technological advancement in minimizing cost in ESLSE.
- To assess the effect of technological advancement in improving overall integration between the shipping system of ESLSE.
- To assess the effect of technological advancement in improving cargo delivery time for ESLSE.

1.5. Significance of the Study

As ESLSE is the major player by providing logistics services in the Country's economy, having a new advanced technology will give a certain edge to the improvement of the overall improvement of the services given by the company. In doing this study it will pave a way for other researchers do more studies in this area so that a well refined final outcome is reached so that the Country's national carrier will use it to improve its overall services and bring it to the current stage of technological advancement. In addition many international organizations like the World Bank put the performance of ESLSE to be mediocre and this study will help in providing necessary findings and recommendations so that the organization can use it in improving its overall logistics system so that its customers are satisfied and final end users are provided with the required products with minimum setbacks.

1.6.Scope of the Study

The performance of a shipping company's logistics is greatly impacted by technological advancement. In terms of time, money, and research manageability, doing the study is challenging and unmanageable in all places where ESLSE operates. The focus of this study is therefore restricted to how technology (automation) innovation affects ESLSE's logistical performance. Only the ESLSE head office in Addis Abeba was studied in order to control the research flow. In addition three years financial performance of the company is used to show how the company is carrying out its activities.

The effect of technological advancement on the logistics performance is measured on the basic indicators of improved net profit, minimized cost, integrated shipping systems and improved delivery time registered. The above will show the required effect in relation to the technological advancement. The scope of the investigation is limited to descriptive type of research design since the outcome is unknown and also explanatory design is also applied since there is a cause and effect relationship between the variables by this it tries to examine the effect of technological (automation) advancement on logistics performance in Ethiopian Shipping and Logistics Enterprise (ESLSE).

By analyzing how the case company, Ethiopian Shipping and Logistics Services Enterprise (ESLSE), which is based in Addis Abeba, interacts with technological improvement in order to improve the logistics performance, the study's focus is further restricted to this particular company.

1.7.Limitation of the Study

The investigation focuses on the Ethiopian Shipping and Logistics Enterprise, particularly its headquarters even though the topic is vast and can involve a lot of stake holders in relation logistics. The willingness and timely response of respondents will be one pull back when conducting this study. Furthermore, the time and cost factor will have further pull to conduct an extensive research on the topic.

1.8.Definition of Terms

Automation: The process of combining particular software, technology, and infrastructure to streamline fulfillment planning and shipping tasks; eliminate manual processes; and minimize human error is referred to as shipping automation. The purpose of shipping automation is to eliminate the need for trained or unskilled labor to undertake repetitive operations such as rate shopping or carrier availability. Most significantly, automated shipping processes promote higher efficiency, which leads to increased production, allowing your team to fill, process, and ship more orders in less time. Champion (2023)

Technological Advancement: technology is the use of equipment, machines, supplies, procedures, and energy sources to facilitate and improve work. Technology deals with making things happen, but science is interested in understanding how and why things happen. As humans grow, modern technology has undoubtedly had a significant impact on the entire world, particularly through the global connectivity fostered by the internet, smartphone technology, and other handheld advancements. Begum (2018)

Logistics Management; designing, implementing, and monitoring transit in both directions as well as the keeping of commodities, services, and related data between origin and consumption places in order to suit customer needs. (Council of Supply Chain Management Professionals)

Supply Chain Management; includes all actions related to sourcing, purchasing, conversion, and logistics management in its planning and administration. It is crucial that it also incorporates channel partners in coordination and collaboration—suppliers, middlemen, third-party service providers, and customers. In essence, supply chain management integrates supply and demand management within and between enterprises. (Council of Supply Chain Management Professionals)

Technology; Customs agents, port employees, and transportation professionals are becoming more and more aware of the benefits of new technologies and digitalization for sustaining business continuity during disruptions in addition to increasing productivity. Advanced analytics, on-board sensors, communications, port-call optimization, block chains, big data, and autonomous ships and vehicles are examples of technological breakthroughs. These technologies have reduced direct contact during the pandemic and kept ships moving, ports open, and international trade active. The development of technology has also encouraged consumers to spend more money online and increased e-commerce. These changes will continue to alter how goods and services are produced and consumed, as well as how ships, ports, and their hinterland linkages transport them. UNCTAD (2021)

Net Profit/Net Income; The amount of money left over after all expenses and income for a period have been taken into account is known as net income, often known as net profit. The income statement's final line, labeled "Net Income," is located at the bottom. Kagan (2020)

Cost; charges associated with transporting cargo from Point A to Point B are commonly referred to as shipping charges. The shipping expenses may include a number of components, depending on the type of contract. forto.com (2016)

On time in Full Delivery; according to Iris Zimmermann. (2018) On Time in Full refers to the company's ability to supply the entire quantity required by the client at the latest on the date specified. When all of the items in a single sales order are delivered on time and in full, the OTIF may be calculated for a whole order.

Quality; according to Ramya (2019) Service conformance to customer expectations is measured in terms of service quality. Operators of service businesses frequently evaluate the quality of the services they deliver to their clients in order to enhance their services, rapidly discover issues, and more accurately gauge client happiness.

1.9.Organization of the Study

This paper is prepared in five sections the first chapter is made up of the back ground of the study, statement of the problem, research questions, objective of the study both the general and specific objectives, The importance of the study, the scope of the investigation, the limitations of the study, the definition of terms, and lastly the organization of the study. Then comes the following section which comprise the literature review which tries to display the related topics in relation to this study in addition the conceptual frame work and the gaps found in the literature review is depicted in this chapter. Chapter three encompasses the methodology of research involved to conduct this study which is the research approach and design, study population and sample size, data sources and types, and data gathering procedures and the ethical consideration. Coming next is the fourth chapter which focuses on the data analysis, result interpretation and discussion. The last chapter will be summarizing the findings followed by conclusion on the outcome and finally providing list of recommendations in relation to the study's limitations and providing proposals for more investigation.

CHAPTER TWO

2. REVIEW OF LITRATURE

2.1. Introduction

In this section of the paper it tries to see how various scholars and writers have described logistics its benefits and over all purpose of it in a brief manner. According to Indian institute of materials management 2020, Organizations must think about novel methods to deliver value to their consumers in today's fiercely competitive global business environment. An organization must compete with rivals in terms of products, costs, quality, and services due to shifting global market dynamics. This has opened the door for the requirement to create logistics systems that are more sophisticated than conventional ones. The focus of logistics has changed over the past 20 years from being purely operational to being corporate. A growing demand for comprehensive logistics management that affects the entire business aids in lowering costs and improving service.

The French word "Logis" (which means "troop accommodation") is where the word "logistics" first appeared in English. The Greeks used the term "Rhocreanatics" to describe the movement of materials. The military introduced logistics at the beginning of the 19th century and defined it as the organization and transportation of troops. Business Logistics was the name given to the process of logistics when it was first established in 1964. The only aspect of the business Logistics was discussing at the time was the actual distribution of goods. Between the 1960s and 1970s, there was discussion over this distribution's study and application. As a result, logistics was exclusively focused on improving the three P's, as given in: Mohamed et al (2019)

- Place (Location and destination) – Adding value to the customer by transporting items between areas that will maximize their value..
- Period & Pace (Time value) – By emphasizing time, this strategy adds value for customers. Both the flow of commodities and inventory management reflect this..
- Pattern (Forms of order) – By focusing on the intended shape of the items, value is created through ordering.

Only military applications were involved in the rise of logistics, which then began to apply to business enterprises in the 1960s. However, it was only concentrating on the physical distribution of goods and the optimization of transportation inside an organization, which was improved by the machining of transportation tools. As a result, logistics met the industrial needs that consumers had originally generated. Mohamed et al (2019)

2.2. Theoretical Review

2.2.1. Definition of Logistics

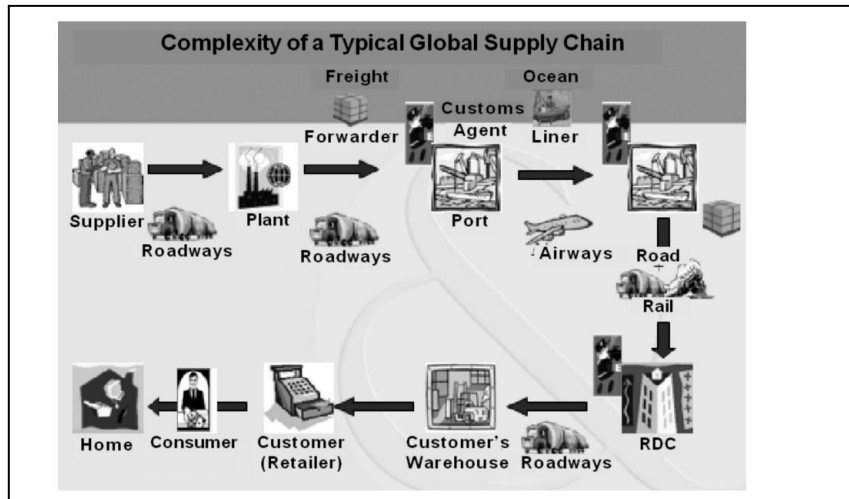
Logistics is the portion of the supply chain processes that organizes, executes, and manages efficient forward and reverse flow, as well as storage of commodities, services, and connecting data between points of origin and consumption to suit customer needs. Few company sectors involve the intricacy or geographic range that logistics does. The main focus of Logistics Notes is on the availability and freshness of their products. Without logistical support, it is challenging to imagine any marketing or manufacturing. Since the dawn of civilization, logistics has been practiced; it is hardly new. But putting best practices in place for logistics has emerged as one of the most fascinating and difficult operational topics in corporate and government management. Logistics speaks of the organization, planning, and the administration of a system that controls the flow of materials within a company. This is an essential part of a multinational company due to territorial restrictions. A multinational company's logistics department handles the transfer in terms of raw materials, coordinating flows into and out of numerous nations, selecting the most cost-effective mode of transportation, packaging products for export, storing products, and overseeing the entire process. Neha (2014)

2.2.2. Supply Chain vs Logistics

Supply chain management is the systematic, strategic coordination of traditional business departments and techniques within a specific company and across enterprises in the supply chain in order to improve the long-term performance of individual companies and the supply chain as a whole. Reji (2008)

SCM is frequently thought of as a subset of logistics. The five main components of the SCM are: Procure, Make, Move, Store, and Service. Most people define logistics as the act of transferring objects from point A to point B, including all steps involved (from carrier selection to planning and execution). Various steps of the supply chain, including from the supplier to the plant, the plant to the distribution center, the distribution center to the store, the store to the client, or any combination of these stages, require logistics. (Ibid)

Fig 2.1: Complexity of a Typical Global Supply chain (Reji, 2008)



2.2.3. Four Logistics Concepts

- **The system concept;** is primarily based on all organizational functions cooperating to maximize benefits. These ideas occasionally call for particular organizational parts to perform below par in order to reach the system's maximum aims.
- **The total cost concept;** is built on the system concept, and cost-based metrics are used to gauge objective achievement.
- **The after-tax concept;** the whole cost notion is a variant of the after-tax concept. This idea aims to maximize after-tax earnings. Due of the numerous varied national tax policies, this idea is growing in popularity..
- **The trade-off concept;** extremely effective means of connecting the system, however it may result in inefficient trade-offs. It is necessary to balance the benefits of such great efficiency with the associated risks..

The logistics system includes several different elements that can be mixed in various ratios to accomplish a specific objective. While the short-term goal is to withstand competition by recovering marginal costs, the long-term goal is profitability. Reji (2008)

2.2.4. Major Components of Logistics Management

- **Demand planning;** Determining all logistics-related elements is essential to maintaining a balance between supply and demand. Because it makes sure that operations are well-planned, logistics management prevents interruptions in the flow of commodities. In order to evaluate and forecast demand for goods and services in SCM, firms can streamline the management logistics process..

A key element of the supply chain that can prevent an inadequate or inappropriate supply of commodities is careful planning. For good logistics management, it involves tasks like warehousing, material handling, and storage. Analyzing historical data, statistical forecasting, and the entire product lifecycle is also an aim in order to remain ahead of market changes.. axetrack.com (2012)

- **Storage and Material Handling;** Because of the erratic nature of market demand in the modern world, it is crucial that there be a supply of goods on hand to meet customers' unforeseen needs. The products or materials need to be properly preserved and stored. To make sure that commodities are simple to store, move, and transport, warehouse management systems (WMS) are crucial.

The smooth operation of supply chain operations benefits from WMS's optimization of storage capabilities, equipment, and equipment expenses as well as its reduction of distribution and transportation costs. Additionally, improperly managed items may become faulty, resulting in additional financial loss for the company. As a result, it is regarded as a crucial element of logistics management. axetrack.com (2012)

- **Inventory Management;** Companies examine inventory levels on a regular basis to track the flow of items into and out of warehouses. It examines and determines how much stock to order, when to order it, and where it should be stored. As a result, keeping an efficient inventory level is critical to meeting client demands. Companies can avoid having too much or too little product on hand by using proper inventory management. It even forecasts consumer demand, allowing for more efficient order planning and organization.

Inventory control and management software automates supply chain activities, making workflows simple and practical. Inventory management systems are also necessary for optimizing stock levels. Real-time monitoring is an important aspect of logistics of inventories and strategic planning. axetrack.com (2012)

- **Fleet Management;** as it encompasses tasks like increasing asset utilization, fleet maintenance planning, and cost management, managing and monitoring commercial vehicles is a crucial part of logistics. To increase the productivity of their fleets and drivers, businesses are investing in fleet management software today.

It uses cutting-edge technical solutions to give fleet owners real-time updates and insights. Additionally, it is a successful strategy for rising driving and vehicle safety standards. As a result, the fleet management system usually uses accurate reporting and predictive analytics to give all the information related to the fleets. axetrack.com (2012)

- **Transportation Management;** the distribution of commodities to their final location is planned and supported by it, making it the most crucial element of logistics management. It can be transported using freight trains, cars, ships, and other means of transportation. By making the transportation more efficient, the commodities or objects are delivered to the customer on schedule.

The expansion of the firm can benefit from investing in a transport management system because it even controls the reverse flow of goods. Numerous advantages result from it, including lower costs, smaller carbon footprints, on-time deliveries, and others. Some businesses also prefer consolidation because it combines several smaller shipments into one. As a result, this can improve customer service because the products will be delivered on time or even earlier. axetrack.com (2012)

- **Information and Control;** the logistics sector is thought to have a bright future with the adoption of new technology. Data-driven insights are provided by software and processes, which aid businesses in more effective supply chain management. It often forecasts demand and transit schedules, enabling businesses to make more cost-effective choices. It's critical to keep the information flowing to be able to gain insightful knowledge and more precisely manage demand. However, in order to attain transparency throughout the whole supply chain, businesses are adopting cutting-edge technology including big data, the internet of things, artificial intelligence, and block chain. As a result, each of these components can only be carried out properly when the proper information is obtained and the logistical operations are under control.. axetrack.com (2012)

2.2.5. Logistics Activities

According to wordpress.com (2010), Logistics is consisting of five interrelated activities: costumer response, inventory planning and management, supply, transportation, and warehousing.

- **Customer Response;** Customer response connects logistics both internally to sales and marketing and externally to the customer base. When the customer service policy (CSP) is optimized while identifying and implementing inventory carrying, distribution, and distribution strategies that generate the lowest cost of missed sales.

The actions taken by the customer response logistics include;

- Creating and upholding a policy for customer service.
- Keep track of customer happiness.
- Order entry (OE).
- Order Processing (OP).
- Billing and gathering efforts.
- **Inventory Planning and Management;** The goal of inventory planning and management (IP&M) is to establish and maintain the lowest inventory levels that can be achieved while still meeting the customer service policy's objectives. The logistics of inventory management and planning comprise;
 - Forecasting.
 - Order quantity engineering.
 - Service level improvement.
 - Planning for replenishment.
 - Inventory deployment.
- **Supply;** the method of constructing inventory (via manufacture and/or buying) to the goals set in inventory planning is known as supply. In order to achieve the availability, reaction time, and quality requirements specified in the customers' service policy and the inventory master plan, supply management must reduce the total acquisition cost (TAC). The logistics supply includes;
 - Developing and maintaining a Supplier Service Policy (SSP)
 - Sourcing
 - Supplier integration

- Purchase order processing
- Buying and payment
- **Transportation;** The consumers we have chosen to serve as parts of our customer service policy are physically connected to the sources of supply identified during sourcing. The reason we reserve transportation for the fourth spot on the list of logistical activities is because before a transportation scheme can be designed, the deliver-to points, reaction time criteria, and customer service policy must be in place, as well as the pick-up sites identified in the supply plan.

The purpose of transportation is responsible for connecting all collection and delivery locations at the lowest possible cost while adhering to the response time guidelines set forth by the customers' service policies. The logistics if transportations include;

- Network planning and improvement.
- Shipment management.
- Management of the fleet and containers.
- Carrier management.
- Freight management.
- **Warehousing;** because strong planning in the other four tasks may be sufficient to eliminate the necessity for warehousing or may recommend that the warehousing activity be outsourced, I have listed warehousing as the final of the five logistics tasks. A strong warehouse strategy also depicts the effectiveness or ineffectiveness of the complete supply chain.

In order to meet the cycle speed and shipment accuracy requirements of the customers' service policy and the storage capacity requirements of the inventory play, warehousing must reduce the cost of labor, space, and equipment in the warehouse. Included in the logistics of warehousing are;

- Receiving
- Put away
- Storage
- Order picking
- Shipping

Fig 2.2: Logistics activities wordpress.com (2010)



2.2.6. Benefits of Logistics Management

According to analyticssteps.com (2021) Effective logistics management must be used by firms if they want to stay stable and competitive. Businesses can satisfy demand and customer expectations when logistics are managed effectively.

- **Increasing customer satisfaction;** logistics management helps give prompt, top-notch service. Because consumers may become disappointed as a result of delayed deliveries, a management strategy can consistently work to improve transportation practices and avoid any delays.

By offering better customer service and a smooth freight processing process, more value may be added to the customer experience. Providing better customer service may enhance the reputation of your company or brand and increase sales. Therefore, effectively managed logistics results in an excellent overall customer experience.

- **Reducing operating costs;** logistics function effectively when there is a high degree of transparency and openness in operations. To increase efficiency and reduce fuel costs, a good logistics management plan may look at previous data and optimize routes..

You may boost business productivity, reduce costs, and make the most of your assets with the aid of logistics management.

- **Increased profitability;** Logistics management may help businesses get a complete picture of their operations, improve client interactions, and do away with the need for excess inventory. This increases the order completion rate, which raises the business' profitability.

Businesses can reduce operational expenses and assure coordinated supply chain management by applying route optimization tools, the most recent technological innovations, and optimizing fleet capacity utilization.

- **More efficient intermodal operations;** Intermodal operations involve moving goods via two or more carriers, or modes, from a source to a client. Certain standardized containers are used in intermodal operations to prevent the risks of handling products directly. Better intermodal operations are more reliable and safe, save money, and are more ecologically friendly.
- **More efficient and productive delivery;** Logistics places an emphasis on reducing procedures and boosting effectiveness while preserving profit margins. By reducing resource waste, delivery productivity is ensured without compromising on timely product delivery.

By ensuring quality standards are met, lowering failures, faults, and deviations, logistics management may ensure that delivery productivity is not damaged.

2.2.7. Role of Logistics in Organization

According to Gunjali et al (2020) Logistics is an important aspect of supply chain management. It entails the planning, execution, and administration of commodities, services, and information from point of origin to point of consumption. Logistics is responsible for coordinating the complex web of shipping, receiving, import and export operations, warehousing, inventory control, purchasing, production scheduling, and customer service. Businesses see logistics as an essential component of supply chain design. It is used to manage, coordinate, and track the resources needed to move goods in a seamless, punctual, cost-effective, and dependable manner. And its basic roles are

- Companies may cut cost and improve customer service with the use of logistics management.
- If not carefully planned, logistics and supply chain management can make or destroy your company. It takes time and can be expensive. These factors make them one of the main functions in a company.
- Logistics management reduces the cost of inventory in the supply chain process.
- That component of the supply chain process that organizes, executes, and regulates the efficient flow and storage of products, services, and related information from the point of use or consumption to meet the needs of customers.

- Since customer service satisfaction has developed into a foundation on which firms promote business growth and profitability, using the finest transportation system enhances performance trade-offs to reduce shipping costs and ensure on-time delivery of goods. These procedures and practices underscore the necessity of transportation and warehousing for first-rate customer service and the delivery of end-user products, making them essential elements of a successful logistics management system.

2.2.8. Role of Logistics in the Economy

According to Douglas et al (1998), creating usefulness is one of the main ways logistics adds value. Utility is the value or usefulness that an object or service has in satisfying a want or need from an economic perspective. Form, possession, time, and location are the four categories that make up utility. The logistics field provides vital support for the latter two, time and place utility.

Form utility Putting the product or service in the right form for the user to use is known as form utility. Form utility is produced when Honda of America Manufacturing turns components and raw materials into automobiles. Typically, this is a step in the production or operating process.

Possession utility the value that is added to a good or service because the client may actually take possession of it is known as possession utility. Credit agreements, loans, and other financing mechanisms make this possible. For instance, possession utility becomes available when General Motors Acceptance Corporation grants a loan to a potential auto buyer.

Form and utility of possession, while not directly related to logistics, would not be possible without getting the correct materials required for consumption or production to the right place, at the right time, in the right quality, and at the right price.

The value increased by having an item on hand when needed is known as **time utility**. This could happen within the company, such as having all production components and materials, preventing the need to shut down the production line. If the product is unavailable when the customer needs it, it is of no use to them.

Place utility, which refers to having the good or service available where it is needed, is closely related to this. Customers do not benefit from having a place to store a wanted item if it is in transit, a warehouse, or another store. A consumer could not be happy without the time and place utility that logistics directly supports.

2.2.9. Logistics Performance

The basic goal of logistics should be general coordination. Andersson P et al (1989). Porter (1990) emphasizes that innovation and upgrading would increase a country's competitiveness. As a result, quantifying The LP is currently the highest priority. Griffis et al. (2007) jeopardized the organizations, according to Forslund (2007). It was originally mentioned in the context of LP in 1985, at a conference organized by The Netherlands Association for Logistics Management in the Netherlands. This lecture helped to build the performance indicators paradigm, and the indicators are now utilized in a variety of industries. MCB University Press (1992).

2.2.10. Delivery Time

The amount of time that the transport units spend traveling between the specified origin and destination terminals is known as the average transport time. In general, transport operators may experience two effects during this time: First, a quicker transport time for the units can result in a quicker loading time overall. Janic (2014). The OTD process is described as a process made up of four sub-processes: the customer ordering, the supplier delivery, the logistics by the service provider (LSP) transportation, and the sub-process for the consumer receiving their items. Forslund et al, (2008).

The supply chain's information driver makes it possible for the other drivers—orders, inventory, and transportation—to cooperate to establish an integrated supply chain. In supply chain information systems, automation should be implemented to the extent that it effectively delivers customer value and corporate profit. It shouldn't be taken for granted since other companies already use it or neglected because it would be too difficult to map out the particular needs of the supply chain and find a system that meets them. Sadler (2007)

2.2.11. Cost

Costs of international transportation play a significant role in trade and economic growth. Recent studies in Asia and the Pacific reveal that trade costs due to other policies, or those that are not tariff-related, account for between 60 and 90 percent of bilateral trade costs, while tariffs only account for 0 to 10 percent of bilateral comprehensive trade costs. To put it another way, factors other than customs fees that affect trade expenses include things like transportation costs, maritime connections, and processes. Economic and Social Commission for Asia and the Pacific (2015).

UNCTAD has evaluated the costs of international transportation (across all forms of transportation) for country groupings based on information from merchandise imports. During the period 2005–2014, international transport

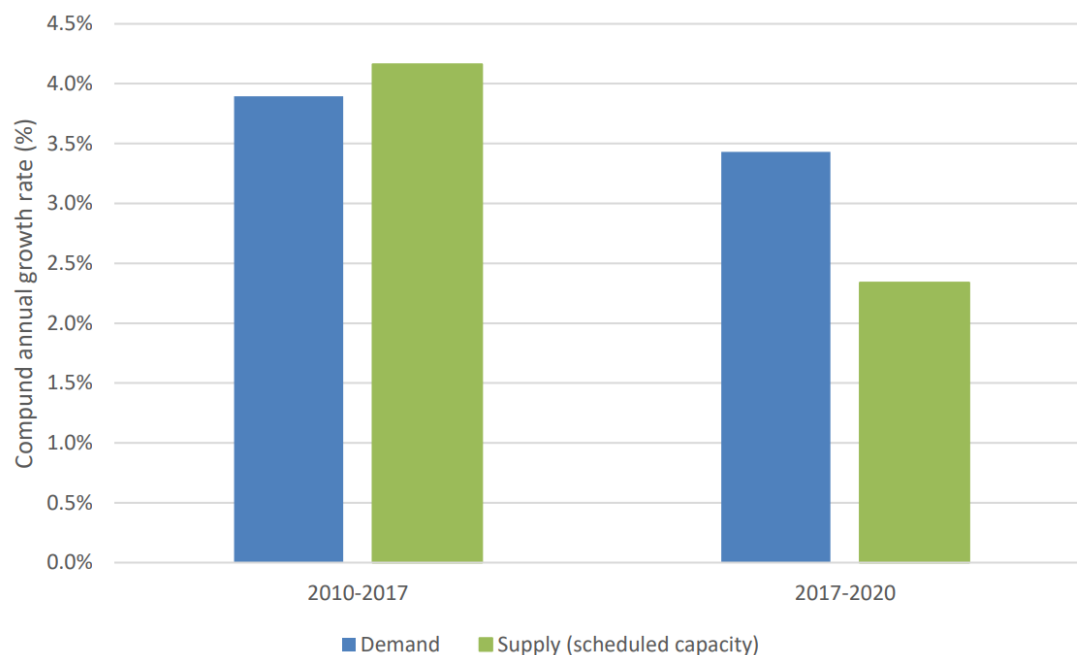
expenses for the average nation amounted to almost 9% of the value of imports. Among the major regional groups, African nations paid the highest average rates (11.4%), compared to wealthy nations' average rates of only 6.8%.

2.2.12. Increasing Capacity

According to ITF 2022, Container shipping companies made an effort to meet the increase the need for transportation by sea in the Far East and North America in the second half of 2020. They were, however, limited by their choices about capacity deployment prior to the crisis: whereas the supply of deployed container ships exceeded demand from 2010 to 2017, the opposite was true from 2017 to 20. Compound annual growth rates for the demand for container transport over this time period reached 3.5%, however, 2.3% for the availability of deployed container ships (Figure 2.3). The previous cap on capacity since 2017 is what led to the shortage of container ship capacity in the second half of 2020. This shortage is anticipated to last until at least 2024, with forecast demand being roughly 3.2% higher than planned ship capacity (including ship orders, net of scrapping), which is estimated to be in the range of 2.5% over 2021–2024 at the time this report was written.

Carriers redirected capacity thorough alternate routes, including as well as East-West round-the-world services that cross Asia-Europe-North America and Asia, to the transpacific commerce in response to the spike in demand in the Far East and North America. As a result, there was a net shift of capacity from the Asia-Europe route to the trans-Pacific route in the second quarter of 2020. In the first quarter of 2021, capacity between Asia and Europe was slightly lower than in the same period in 2020. Due to a lack of capacity, freight prices between Asia and Europe may have risen. After the first quarter of 2021, bandwidth between Asia and Europe increased.

Fig 2.3: Global container transport demand vs scheduled liner service capacity, 2010-20 (ITF, 2022)



2.2.13. Expanding to New Market

Multiple vessel categories in the shipping industry are currently experiencing extremely high earnings. Prices for both new construction and used goods have increased. With assets worth USD 50 billion transacted in 2021, the sale and purchase market's transaction volumes exceeded the previous peak from 2007. Last year, huge investments of USD 110 billion were made in new ships. Nearly 40% of ships now in production are expected to have some sort of alternative fuel capabilities. In the upcoming years, we anticipate seeing more participants in the industry's move towards zero carbon. In green corridors, where employment profiles are probably matched by fuel offtake agreements, an increasing number of vessels will be required to trade. Rex & et al, (2022).

According to UNESCAP (2011), this increase in goods trade has taken place at the same time as a boom in foreign direct investment (FDI) by the more affluent Asian economies, initially Japan, but later the Republic of Korea, Taiwan Province of China, Hong Kong, China, and Singapore, in manufacturing facilities located in nations with lower wage costs. This resulted in extraordinary levels of growth in the intra-Asian container trades in the early and middle 1990s, along with trends in manufacturing processes that have encouraged the two-way trade in components and sub-assemblies. As a result of the 1997 crisis, which saw the major importing economies' purchasing power weakened by a recession and currency depreciations, this tendency was sharply reversed.

However, a number of variables indicate that the intra-Asian trade's long-term growth prospects are still favorable:

- The close proximity of several economies at very different stages of economic development.
- The majority of Asian economies' sound medium-to long –term growth prospects.
- The continued significance of more economically developed Asian economies as FDI sources for the regions less developed economies.

Regional trade pacts like the Common Effective Preferential Tariff Scheme (CEPT) of ASEAN

2.2.14. Impact of Technological Advancement on Maritime 2023

According to Sinay (2023) the necessity of digital transformation in recent years has forced businesses across all economic sectors to change. The maritime sector has experienced considerable technical advancements, which have had an impact on the entire supply chain. It is now standard practice in the sector to use digital systems for tracking ships and cargo as well as digital communication and cooperation tools. However, some cutting-edge technologies stand out and provide fascinating potential across a range of domains. These are intended to expedite, safeguard, improve upon, and go green shipping.

Robotics technology: this technology has the ability to free people from difficult, dangerous, or physically taxing employment. Automated cargo handling systems help port terminals run more quickly and efficiently, with fewer chances of human mistake, lower emissions, and shorter wait times for ships at anchor or at the quay. For instance, autonomous cranes are used in every significant port in the US, Canada, Asia (China, Singapore, India...), Europe (UK, Germany, France, Spain, the Netherlands...), Australia, and other regions..

Robotics technology advancement also attempts to address labor shortages and increase overall productivity in comparison to manual work..

Big data and analytics: Large volumes of data are generated across the entire supply chain, and this data is gathered and analyzed to examine and enhance usages and procedures. This is done by establishing patterns, spotting trends, and making informed decisions. For example, the following tasks can benefit from data-driven insights:

- Estimated demand.
- Sailing route optimization by shipping corporations to cut down on fuel use and carbon footprint (minimizes emissions and waste, enhances recycling...).
- Reduced expenses and accident hazards.
- identify creative methods to increase productivity and profitability;

Block chain technology: This technology is being used more and more in the marine sector to improve efficiency, security, and visibility in a variety of areas, including supply chain management, vessel registration, and cargo tracking. Block chain's fundamental idea entails a decentralized digital ledger that offers a safe and transparent means to record transactions..

Block chain, for example, may generate an immutable record of a ship's movements using its distributed design, which can help to avoid fraud and improve safety. Furthermore, the usage of smart contracts on a block chain platform instead of paperwork can help automate numerous operations, decreasing delays and saving money.

2.2.15. Benefits of Technological Advancement in the Maritime Industry

Based on Sinay (2023) Companies in the marine industry may improve the value chain and fulfill the needs of tech-savvy business users by using the power of the latest digital technologies: cheaper and faster shipping, increased flexibility, real-time visibility on operations, and better customer experience.

- Boost productivity, resulting in more efficient operations.
- Improve traffic patterns to cut down on delays, fuel use, and greenhouse gas emissions.
- Reduce operating expense.
- Utilize predictive knowledge to reduce risks.
- Establish connections between companies and clients to improve communication and raise client satisfaction.
- Automate data gathering and analysis in a centralized system to promote better judgment and resource utilization.
- Get rid of manual paperwork to save time and minimize human error.

2.2.16. Advantages of Automation in Shipping Industry

The following are the primary benefits of automating logistics according to stocklogistic.com (2019):

- **Loading and data analysis are available in real time.** You can make better business decisions when you have access to load data and the capacity to produce reports.
- **Errors that cost a lot of money are reduced.** A lot of errors might occur during human data entry, resulting in increased delivery costs.
- **Control within the organization.** The systems are usually adaptable enough to the company's business regulations while also powerful enough to force all users, whether internal and external, to adhere to the policies that assure effective and profitable shipping.
- **Improved customer experience** by implementing real-time cargo tracking, auto pick-up, proper insurance, and cargo accounting into your order parameters.
- **Scalability and speed are important considerations.** For example, the software allows for easier entrance into the system and more agile management of a warehouse. Furthermore, regardless of how many shipments you have in each location, all transport invoices can be combined into a single weekly invoice.

2.2.17. General Overview of ESLSE

The company was founded to carry out a number of activities, with the provision of shipping services in international and domestic seas, the provision of multimodal logistics, the development and extension of ports, and the fulfillment of other associated logistic services being its main objectives. Ethiopian shipping and logistics service providers offer shipping and logistics services on land and at sea for a variety of commodities, including consumer goods, industrial goods, small and large machinery, cars, trucks, and other vehicles. The business is gratifying national and foreign investors working in our nation by offering quick and flexible logistics and transportation services. By accomplishing this, it contributes to the shift of our nation's economy from one centered on agricultural to one based on industry. ESLSE (2022)

The company strives to establish itself as a favored and well-known African company in the shipping and logistics industry. By actually putting the ideals of honesty, explicitness, accountability, and perspective into practice, the company is growing and improving. It strives to fulfill its purpose of offering first-rate shipping and logistics services while contributing to economic development. The organization is made up of three goal-executing sectors and managers-responsible charters. Shipment service, logistics service, ports and terminal service, and corporate services make up the enterprise's four sectors. (Ibid)

2.2.17.1. Ethiopian Shipping and Logistics Enterprise Journey to Success

The company regularly broadens the scope of its services, which helps it produce flawless outcomes and establish itself as a reputable African corporation. The business expanded its trade network in the previous years, expanding its service to 345 worldwide seaports. The company is using Berbera port in addition to Djibouti port, which was formerly the only port used for the nation's import-export business for decades. The company is thinking about exploiting the Mitswa and Lamu ports as a possibility to provide services that go beyond time. ESLSE (2022)

2.2.17.2. Application of New Ideas and Inventions

- ERP technology is being used by an Ethiopian shipping and logistics company to totally outsource paperwork and digitally manage ships from their origin port to their destination port.
- The company unveiled a website where clients could follow the progress of their shipments.
- The company quickly modernized and sped up its operations by implementing the cyzen principle throughout all of its branches.

2.2.17.3. Financial Heights and Social Responsibility

Due to its duty for the nation's import and export logistics, Ethiopian shipping and logistics service firm operates with significant financial resources. Year after year, the company's profits increase and remain consistent, enabling it to assist national development. The company's starting capital of 3.76 billion birrs has increased to 20.88 billion birrs. ELSE (2022)

The Ethiopian shipping and logistics service company has a set budget for taking care of its social obligations. The business engages in volunteer work, environmental protection, and endeavors to improve the quality of life for citizens by focusing on socio-economic activities during regular business hour (Ibid)

2.2.17.4. New Destinations

The company transports its goods on both its own ships and those of other companies. Up until recently, the company transported 80% of the imported commodities into the country using ships owned by other companies.

- In addition to the 9 ships and two oil tankers it already has, the company is looking to acquire an additional two ships to add to its fleet in order to enhance the amount of cargo it can transport.
- The company's only focus is on transforming Mojo's dry port and terminal into a logistics hub and an all-purpose port for our nation and east Africa.

The company is looking on ways to fulfill its ten-year lead and strategic plan. ESLSE (2022)

2.3. Empirical Review

Ana Ruiz Garcia (2021) conducted a study on the effects of technology, and she came to the conclusion that while the rest of the world has undergone significant change in the last ten years due to the digital revolution, the international trade industry has lagged behind in adopting new technology. Thankfully, the software and technology in the supply chain are starting to advance. Using cutting-edge software and solutions for exporters, importers, ports, and shipping lines all around the world, technology businesses today are substantially increasing the efficiency of international trade. No business can streamline such a vast and complex sector. These forward-thinking tech companies must do the following to truly revolutionize this sector:

In a study done by Molodabekova & et al (2021), the level of digitization in EU nations is shown to be the foundation for the growth of economies' logistical performance through empirical research. Specific digitization elements have a considerable impact on the dimensions of a country's logistical performance, as the study demonstrates. A high level of technological and digital preparedness is needed to deploy Industry 4.0 components in logistical procedures. This is discovered and obtained from the performance of the EU nations in the two indexes (DESI and LPI), respectively. As a result, in a broader sense, the usage of internet services and the integration of digital technologies influence the effectiveness of logistics and the efficiency of logistical services. The findings also show that government policies must put a strong emphasis on providing sound fundamental circumstances for the digital transformation of the business and society in the form of human capital, specifically: ICT knowledge. In order to improve the performance of the nation's logistics, the governments should also advance digital connection by supporting fixed broadband and 4G coverage.

Based on the study by Jian & et al (2022); the high-quality development of the shipping industry and digital innovation differ regionally, and the high-quality development of the shipping industry is of a higher standard in the regions with significant digital innovation. Second, although its potential has not been fully realized, digital innovation contributes significantly to the high-quality development of the transportation business. The high-quality development of the shipping industry will increase by 1.233 units for every extra unit of digital innovation. Thirdly, high-quality development of the shipping business is significantly influenced by expenditures in education and technology as well as the growth of other transportation industries.

2.4.Literature Gaps Identified

Research done in African Maritime Industry which will affect to get the overall picture of the industry in In going through the various documents certain gaps are identified among them is the lack of sufficient the continent. Even if few researches are done they are done in a manner which does not provide the required information due to lack of adequate material to go through. Most of the researches done are focused on the traditional ways of doing business instead of exploring the technological factor. Most of the works done are found in the Eastern Asia, the Americas and EU since most of the major trading are done in or out of these countries. Failure to substantiate sample sizes or sample selection methods is also observed. In addition it is observed that most of the participants tend to be on the management side and it would have been good if the lower level or front line workers are involved as they are the ones who observe the day to day challenges of the industry when it comes to handling consignments and moving them through the logistics system. In the future these gaps will open ways to include African liners in order to enhance their overall effectiveness to service the continent efficiently and effectively.

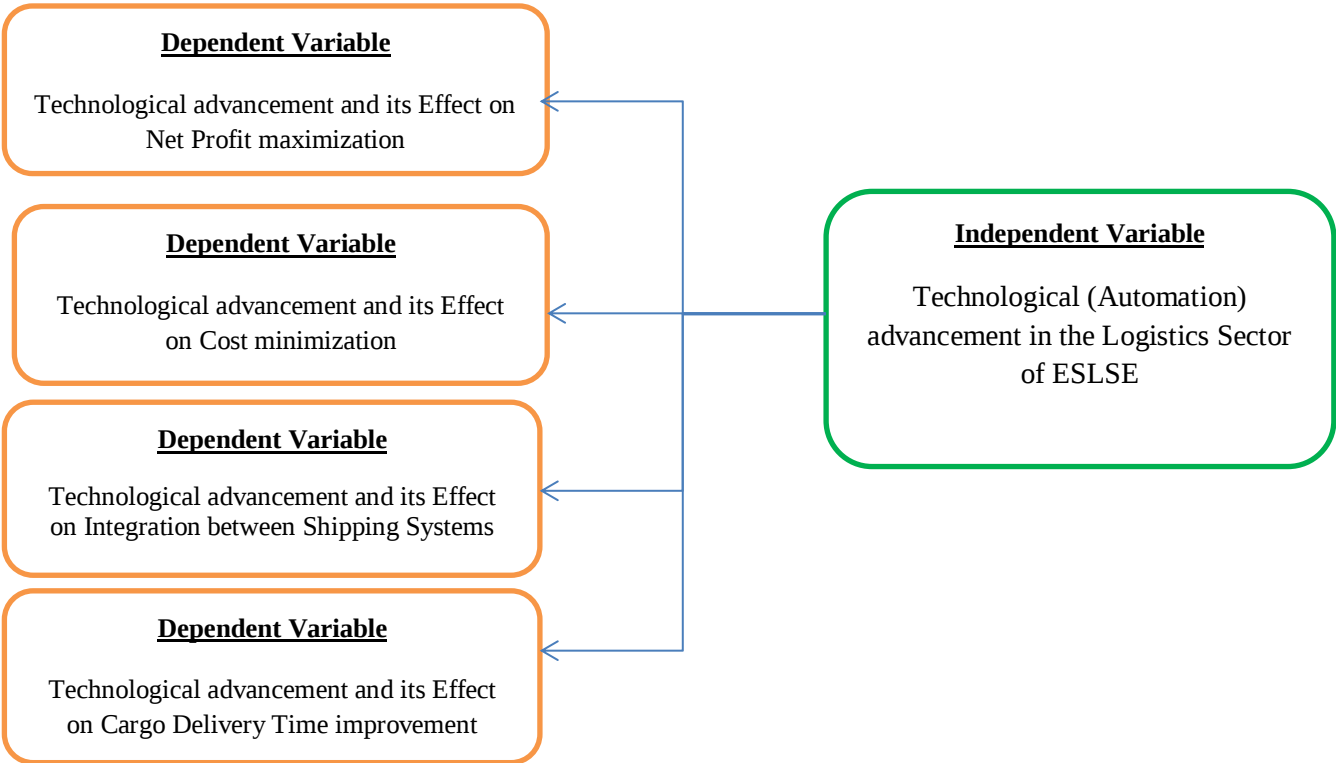
Furthermore, the studies in this area specially ESLSE is under explored and cannot be easily found for countries like Ethiopia given this the purpose and benefit of automation improvement or advancement has not been adequately assessed in most researches particular to the logistics activities done for Ethiopia. Most of the activities are done in a conventional manner instead of modernizing its activities especially in the customer service sector which need to be brought to the latest version of service giving so that the clients are served with the best service a shipping company should give in relation to better delivery time, giving real time information on timely basis and minimized service charges to the customer. In doing so the service provider must also take into consideration the minimization of cost and increment of revenues in general. In the above gaps identified most of the researches done are focused on other areas in a geographical manner and this issues must be addressed in contest of the shipping industry service with in the Country as well.

2.5.Conceptual Framework

The concept of conceptual framework has been explained and clarified by a number of academics. The final result of combining a number of linked concepts is a conceptual framework, which explains and provides a more comprehensive understanding of the event under study. This suggests that a conceptual framework is a summary of many findings from the literature sources regarding the research that have been examined, outlining the research agenda for better comprehension of the research aims. By giving an inquiry a framework that organizes the currents of thought that give it emphasis and direction, insight is attained Imenda (2014). An explanation of your conceptual framework shows how your variables should be related to one another. It lays out how your research's pertinent goals fit together to provide logical findings and outlines the relevant aims for your study method. Swaen & George (2022). In this study the researcher tries to see the result of technology on logistics

performance in terms of improved delivery time, minimized cost, increased net profit, and integration between shipping systems;

Fig 2.4: Conceptual Framework model



Source: Swaen & George (2022) published on Scribbr

CHAPTER THREE

3. RESEARCH DESIGN AND METODOLOGY

3.1.Introduction

In this section it is shown the general procedures for getting the desired data so that the research objectives are met. And with great care and planning in setting up the process map will help get the desired results. The data source and the way of collection is clearly depicted in this chapter, the target population and the number of respondents is carefully set out so that the validity of the research is maintained throughout. Furthermore, the data analysis, processing and exhibition are also put out so that when readers go through the paper it would be easy to understand the overall processes from the get go.

3.2.Description of the Study Area

This study aims to examine the effect of technological advancement on logistics performance in Ethiopian Shipping and Logistics Enterprise. The Ethiopian Shipping Lines is one of the government-owned businesses that is emerging, but there hasn't been much coverage of it in the local and international media, making it difficult to recognize its enormous impact on the economy of the nation. The Ethiopian Government and Taurus Investment Inc. have agreed to establish Ethiopian Shipping Lines with an initial capital of 50,000 ETB and a headquarters in Washington, DC, was made on March 10, 1964, and is remembered as a significant day. Then ESL signed a contract with the Dutch company VEROLME group for the delivery of ships as well as technical, operational, and management support. The M.V. "Lion of Judah" and the M.V. "Queen of Sheba" as well as the oil tanker "Lalibela" were initially ordered and ceremoniously launched in Rotterdam in 1966. Since then, Ethiopian Shipping Lines Share Company (ESLSC) has been conducting major fleet expansion plans in response to the demand for shipping services. With 122 million in capital, it was reestablished in 1994 with the intention of providing coastal and international marine transport services. (waltainfo.com, 2011)

ESLSC has been working extremely hard to realize its mission of becoming a contemporary indigenous shipping company that provides dependable and cost-effective marine transport to the nation's export and import trade. The ESLSC consists of individuals working on land and at sea in a variety of levels and positions. Under their motto, which reads as follows, they hope to increase their market share and develop the advanced shipping lines sector. "think big to achieve big and act with confidence". In the past 50 years, ESLSC has made significant progress. It overcame several obstacles and eventually established itself as a pillar of Ethiopia's economic expansion. Routes between the U K/Northern and Western Europe, which at the time represented the primary

direction of Ethiopia's import and export trade, were where ESLSC reportedly inaugurated its initial operation. Then, it extended its services to the Red Sea, the Mediterranean, the Adriatic, the Far Eastern regions, and the Gulf regions. Since ESLSC now operates out of the port of Djibouti and offers dependable and effective services, numerous business organizations have expressed interest in using it. (waltainfo.com, 2011)

This merger produced the Ethiopian Shipping and Logistics Services Enterprise, or ESL for short. Following the issuance of Regulation No. 255/2011 by the Council of Ministers, this newly combined enterprise was established. It is charged with the tremendous responsibility of providing more effective and efficient sea-transport and logistics services to the nation's importers, exporters, and investors by minimizing transit time, cost, and handoffs. In addition, Comet Transport SC, a trucking company, has recently been transferred to ESL as a result of a mid-2014 government decree. (<https://www.eslse.et/overview.html>)

3.3. Research Approach

This research will be conducted using both a qualitative and quantitative research approach. The meaning of people's experiences, cultures, and viewpoints on a specific topic or scenario are all investigated in qualitative research. The goal of quantitative research is to look into the link between various variables such as dependent, independent, and extraneous variables. Creswell (2009).

Quantitative research is a method for testing objective hypotheses by investigating the relationship between variables. These variables can be measured, often with the use of instruments, to allow statistical analysis of numerical data. The final written report must follow the following format: introduction, literature and theory, methodology, results, and discussion. Individuals that use this method of investigation, such as qualitative researchers, make assumptions about their ability to generalize and reproduce data, compensate for alternative hypotheses, include bias safeguards, and test theories deductively. Creswell (2009)

Mixed methods research is a type of research. Collecting quantitative and qualitative data, merging the two types of data, and employing unique methods that may include philosophical assumptions and theoretical frameworks are all part of research. This research approach is founded on the fundamental notion that combining qualitative and quantitative methodologies provides a better grasp of a study problem than either method alone. Creswell (2009)

3.4. Research Design

Because the primary goal of the research was empirical examination, the study used a descriptive research design to see the Effects of technological advancement on logistics performance in Ethiopian Shipping and Logistics Enterprise further more since there is a cause and effect relationship between the variables explanatory design is also applied to conduct this study.

Research studies classified as descriptive are ones that focus on describing the traits of a certain person or group. Descriptive research investigations include those that deal with particular predictions, the narrating of facts and qualities pertaining to an individual, a group, or a scenario Kothari (2004). The dependent variable has to do with the subsequent phenomena, whereas the independent variable has to do with the antecedent phenomenon. Consequently, in order to fully characterize the impact and connections between the independent factors and the dependent variable Studies that are descriptive in nature are used.

3.5. Population and Sample Design

3.5.1. Population

ESLSE according to the data collected from the corporate communications department has well over 3,770 employees all over the nation and due to time logistics and time constraint this research tries the required data for the workers located in the head office. The total number of workers in the head office is estimated to be around 749 located in the various departments of the organization with in the head office, for our research purpose we have narrowed the population to the departments involved mainly on the overall logistics namely the Corporate Communication department, Multimodal Operations department, Unimodal Operations department, Commercial, Operations department, and IT (Inland Transport) department. And when seeing the workers involved in this department their total will narrow down to 481 personnel all in all.

3.5.2. Sampling Unit

The sampling unit for this study focuses on the individuals who have direct relation with the logistics of the consignments like stated earlier the multimodal and unimodal shipping officers, commercial shipping officers, port and terminal officers and the management staff.

3.5.3. Sampling Technique

Because the general population of the study is heterogeneous, the researcher employed probability sampling, namely the stratified sample strategy, to achieve the goal of this study. Based on the departments that have a direct involvement in the logistical activities of the organization, the study's target population was separated into five strata. The samples are then drawn from each stratum based on their proportion of the population. Because the study requires diverse people's knowledge of current logistical actions, a stratified sample technique is used to ensure an appropriate representation of individuals from each relevant sector or division. The following departments were used as strata from which data were gathered:

Multimodal Operations Department, Unimodal Operations Department, Corporate Communication, Commercial Department and IT (Inland Transport) Department are considered in the sample.

3.5.4. Sample Size

The higher the sampling size of a study, the more accurate the data obtained, according to Malhortra and Peterson (2006) and Zikmund (2003). However, the sample determination procedure proposed by J Carvalho, (1984) was constrained by time and budgetary constraints as well as the characteristics of the population. "Archival application of mathematical sampling techniques", (1984). (Quoted by national Archive report Richmond, 2005) was preferred to be used by researcher as a method to determine a sample size.

Table 3.1: Sample size determination

Population	Small	Medium	Large
51-90	5	13	20
91-150	8	20	32
151-280	13	32	50
281-500	20	50	80
501-1200	32	80	125
1201-3200	50	125	200
3201-10,000	80	200	315
10,001-35,000	125	315	500
35,001-150,000	200	500	800

Source: (Carvalho, 1984) as quoted by (national Archive report Richmond, 2005)

Table 3.2: Breakdown of respondents based on departments

S. No	Department	Total Target Population	Sample size of each stratum	% Coverage of each stratum
1	Multimodal Operation	145	25	30.12%
2	Unimodal Operation	130	22	26.51%
3	Corporate Communication	52	9	10.84%
4	Commercial Operation	93	16	19.28%
5	Inland Transport	61	11	13.25%
Total		481	83	100%

In research, the term "sample size" refers to the number of participants included in a sample size. The phrase "sample size" refers to a group of people picked from the general public who are deemed to be representative of the actual population for that particular study. (<https://www.omniconvert.com/what-is/sample-size/>).

Since the population size is are more or less the same type the investigator use 90% confidence level since reducing the sample size does not have big impact on the outcome of study;

$$n = \frac{N}{1 + Ne^2}$$

$$n = 481 / 1 + 481(.10)^2 = 82.79$$

Where;

n=sample size

N=Population size

e=the error of sample

3.6.Data Source and Type

Using both primary and secondary data collecting techniques, the study's necessary data were gathered.

Primary data: - The Company's employees' replies to a self-administered questionnaire containing closed-ended questions were used to gather primary data for qualitative and quantitative analyses, respectively. Because it is beneficial to ask respondents to rank their opinions on the items of multiple dimensions, it is an ideal measurement strategy. Depending on the respondents' availability and desire, an additional informal interview will be conducted in addition to the one mentioned above.

Secondary data: - Annual reports and journals served as a starting point for the research and a source of secondary data.

3.7.Data Collection Procedures

Two fundamental tools, a questionnaire and document analysis, were utilized to acquire the data.

Questionnaire: It was created using a review of the pertinent literature. The vast number of responses makes this instrument suitable for gathering the required data. The questions are close ended so that the respondents will answer the questions in a fast manner. The questionnaire was thoughtfully created to gauge how the suggested independent variables would affect the dependent variable. Careful consideration was given to the questions' format, language, and sequencing.

Informal interview: In cases where appropriate informal interview may be conducted depending up on the availability and willingness of the respondents.

Document Analysis: With the use of these data collection tools, reports, journals, and pertinent documents from the Corporate Communication department have been examined and obtained. This data collection technique is used to improve the information gathered through the usage of questionnaires and the current stance of the company in terms of logistics performance.

3.8. Ethical Consideration

Ethiopian Shipping and Logistics Services Enterprise (ESLSE) received a formal letter from the School of Commerce, Department of Logistics and Supply Chain Management at Addis Ababa University. to conduct this research and the concerned authorities with in ESLSE. The data collection process began only after the consent of the authorities at ESLSE to conduct the study. Furthermore, to ensure anonymity, the names of the employees (chosen for the sample) were not provided.

The researcher had maintained the voluntary participation of the respondents and keeps the safety of respondents strictly to a professional level to maintain the integrity of this study.

3.9. Method of Data Analysis

Descriptive statistics are used in conjunction with the data from the questionnaire that was collected. Analyzing the useful information gathered from responders requires making the necessary coding. SPSS 2016 (Statistical Package for Social Sciences) is employed. And the secondary data collected from the various publications will be presented separately. For a better outcome, both descriptive and inferential methods are used. A set of data is described using descriptive statistics in terms of the central tendency, the dispersion, and the frequency of occurrence. Regression analysis, correlation analysis, and reliability testing were investigated using inferential statistics.

3.10. Reliability and Validity Test

3.10.1. Assessing Reliability

While reliability is concerned with the accuracy and precision of a measurement technique, validity is the most important criterion and reflects the extent to which an instrument measures what it is intended to measure. If the results of a measuring device are dependable, they must be repeatable. As many elements were employed in all structures; effects in maximizing net profit, effect in minimizing cost, effect in improving the overall integration between shipping systems and effect in improving cargo delivery time were evaluated using Cronbach's Alpha, and reliability values are proven to be more than 0.7 for all constructs, which is ideal Pallant (2005).The table below provides a summary of the reliabilities of all constructs.

Table 3.3: Cronbach's Alpha test of variables

S.No	Variable	Cronbach's Alpha	Cronbach's Alpha based on Standardized Items	No of Items	Reliability Ranges
1	Effects in maximizing net profit	.960	.962	8	Good
2	Effect in minimizing cost	.911	.914	8	Good
3	Effect in improving the overall integration between shipping systems	.920	.917	8	Good
4	Effect in improving cargo delivery time	.939	.941	8	Good

Source: (SPSS output 2023)

3.10.2. Analysis of Validity

In his study, Malhotra (2010) identified three categories of validity: content validity, predictive validity, and construct validity. To guarantee validity, the researcher assessed the questions to see if they were related to the factors utilized by the researcher. This study addressed content validity by reviewing the literature and customizing instruments used in earlier studies. And tries to predict what will happen in the future if technologically advanced systems are employed within the company. Furthermore, it has assessed the impact of sophisticated technologies on ESLSE's logistical performance.

CHAPTER FOUR

4. DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.1. Introduction

As was said in the preceding chapter, this study tried to look at how the Ethiopian Shipping and logistical Service Enterprise fared in terms of logistical performance. As a result, this chapter presents and discusses the study's findings. The questionnaire was designed with five grading categories: strongly disagree (1), disagree (2), neither (3), agree (4), and strongly agree (5). Correlation and regression analyses were performed on a scale-typed questionnaire to determine the impact of technological improvement on the performance of logistics. Employees were given a total of 83 questionnaires, and 78 (93.95%) of them were legitimate and used for analysis. With the aid of the statistical program SPSS (version 16.0), the gathered data were displayed and examined. The degree of link between the many variables under examination was determined through the study's use of correlation analysis, specifically Pearson correlation. Additionally, regression analysis was utilized to examine the relationship between the independent and dependent variables.

4.2. Response Rate

Employees received a total of 83 questionnaires, and 78 (93.95%) of them were returned. Due to refusal to provide information and the unavailability of some respondents, the remaining 5 surveys were not gathered. These indicate that the response rate is roughly 94%.

.Table 4.1: Response rate

S No	Departments	No. of Questionnaire Distributed	No. of Questionnaire Collected	No. of Questionnaire Uncollected
1	Corporate communication	9	9	0
2	Multimodal Operation	25	23	2
3	Unimodal operation	22	21	1
4	Commercial	16	14	2
5	Inland Transport	11	11	0
Total		83	78	5

Source: (Survey data May, 2023)

4.3.Respondent Profile

Table 4.2: Profile of Respondents

S No	Gender	Frequency	Percentage
1	Male	51	65.4%
2	Female	27	34.6%
Total		78	100%
	Age	Frequency	Percentage
1	<25	8	10.3%
2	26-35	54	69.2%
3	36-45	13	16.7%
4	>45	3	3.8%
Total		78	100%
	Work Experience	Frequency	Percentage
1	1-5 Years	12	15.4%
2	6-10 Years	46	59.0%
3	11-15 Years	20	25.6%
4	>15 Years	0	0
Total		78	100%
	Education Level	Frequency	Percentage
1	Diploma	4	5.1%
2	Degree	64	82.1%
3	Masters	10	12.8%
4	PHD	0	0
Total		78	100%

Source: (Survey data May, 2023)

The analysis of the respondents profile in terms of their Sex, Age, and Work Experience and Educational qualification in line with Table 4.2 is presented as follows.

Gender: Out of the 78 respondents 65.4% are male workers located in the head office of ESLSE and the remaining 34.6% are females. From this it is seen majority of the respondents where male. And accordingly all respondents who were selected despite their gender orientation are presumed appropriate to respond for the questionnaires provided to them.

Age: 54 respondents (69.2%) have identified themselves to be in the age group of 26-25, followed by 13 respondents (16.7%) who put themselves in the age group of 36-45, (10.3%) said they are below the age of 25

and the remaining 3 respondents (3.8%) are in the age group above 45. From the responses one can see that the workers involved in this survey majority of them are of the young group identifying themselves below the age of 45. It is presumed that younger generations are more susceptible to changes and are more easily adaptable to improvements on advanced technologies in relation to automation and can easily be trained to achieve a higher performance for the organization.

Work Experience: From the total respondents, 12 respondents (14.4%) fall at a work experience range of 1-5 years, 20 respondents (25.6 %) fall at a work experience level of 11-15, and 46 respondents (59%) who are the majority for this particular survey are with 6-10 years of experience. This suggests that the majority of respondents have relevant knowledge and experience concerning their company and the study's topic. In the above work experience will help get the required information as to how the logistics performance of ESLSE is since the majority of the respondents have better work exposure it would be easy for the them to see how well the technological advancement will help improve the performance of the organization and better serve customers since most of them have direct communication with customers and can get valuable information as to how the current logistics performance of ESLSE is being conducted.

Educational Level: 64 respondents (82.1%) have first degrees (BA/BSc Degree), 10 respondents (12.8%) have second degrees (MSc/MA Degree), and the remaining 4 respondents (5.1%) are diploma holders. 74 responders (94.9%) have a first or second degree. The response shows that the respondents provide relevant and reliable data for the study and that their findings are consistent with those of the questionnaire. As it is known one of the basic things to have an understanding between professional is their educational level in this case it would be easy to have an understanding with the respondents professionally since they are mostly well aware of the various business terms and can have an insight in the strategic thinking and the ability to improve the service levels based on the fact that an application of advanced technology for the automation process would have a positive or negative impact for the activities done with in ESLSE.

4.4. Responses on ESLSE Logistics Performance in Relation to application of Advanced Technology

4.4.1. Response to the various variables indicated

Table 4.3: Mean and Std deviation of responses in maximizing profit

Effect in maximizing profit	mean	Std. Deviation	N
Innovative technologies will maximize the sales performance of ESLSE	4.14	.849	78
Having digital platform for customers will improve the overall income of your organization	4.27	.848	78
Applying new technological advancement will help gain new market shares in the industry	4.38	.725	78
Application of modern machine learning systems for better industry prediction can help improve sales	3.88	.967	78
Real-time information sharing with advanced technologies with customers will have an incremental factor on revenue.	4.18	1.041	78
Technologically improved data storage and sharing platforms will have a better impact in maximizing revenue	4.08	1.148	78
Optimizing routes through big data and predictive analytics helped by software can help increase the revenue of the organization	4.01	1.099	78
Setting up advanced software can help set competitive price by reducing cost and eventually increasing overall revenue	4.09	1.047	78

Source: (Survey data May, 2023)

The respondents' responses on a 5-point Likert scale reflect their level of agreement with the following statement: 1-Strongly Disagree, 2-Disagree, 3-Neutral, 4-Agree, and 5-Strongly Agree are the five possible responses. A mean (M) score of 0–1.5 indicates that respondents strongly disagreed, 1.50–2.50 suggests disagreement, 2.50–3.50 shows neutrality, 3.50–4.50 indicates agreement, and a mean above 4.50 indicates strongly agreed. Based on table 4.3 above, the vast majority of respondents concur that applying advanced technologies will have an impact on increasing net profit. Furthermore, the automation of activities has a positive impact in the maximization of profit in such a way that it will speed up processes and cancel out unwanted activities so that more income is generated with the aspect of implementing an advanced technology which can help generate more revenue for the organization in general.

Table 4.4: Mean and Std deviation of responses in minimizing cost

Effect in minimizing cost	mean	Std. Deviation	N
Automating manual and repetitive tasks will lower the cost incurred within the organization	3.88	1.206	78
Developing an online self-service application for customers will help in minimizing the cost of the company	4.12	.993	78
Application of advanced material handling equipment helps delivery of items without damage	3.92	.977	78
Using online data storage and sharing mechanism will help reduce the cost of stationary and can help the organization to go green	4.12	1.032	78
Advanced technologies can help assign the right personnel for the right job in an effective and efficient way	3.86	.922	78
Advanced technologies can best help track the assets of ESLSE in an organized manner and get the best benefit out of them with minimum cost	4.01	1.000	78
Advanced digital solutions can reduce the overall cost of the organization	4.06	1.024	78
Digital tracking and identification of consignments at ports in short period of time can help reduce the cost of the organization	4.06	1.049	78

Source: (Survey data May, 2023)

In the above table 4.4 the respondent's mean response is above 3.50 therefore, they have agreed or strongly agreed that applying advanced technology will help in minimizing overall cost of the business. In relation to this one of the cost generating factor is the fact that many uncesary repetitive and time consuming tasks are involved like payment checking, booking, providing quotations and so much more and the respondents believe that if an automated system is set out to do these works the cost will be minimized. Because customers will use self-service systems like mobile apps and the like the employees of ESLSE would rather focus on strategic works which can help the company get other constructive imputes from its employees since they would be assigned to work on necessary and fruitful tasks which can bring about a better income and decreased cost for the company. In doing so it would benefit the Enterprise in reducing its cost and a minimized cost will help further improve the net income of the company since resources will be better assigned to the various activities.

Table 4.5: Mean and Std deviation of responses on overall integration

Effect in improving the overall integration between shipping systems	mean	Std. Deviation	N
Having fast and actual information sharing platform with in the organization help in upgrading the performance of the various parties with in the system	4.38	.793	78
Advanced technologies can help in boosting order processing time with in each department	4.08	1.054	78
The flow of information among departments will be bettered with the use of enhanced automated system	3.97	1.057	78
Improved technology will help the different department's response time to challenges in an integrated manner	4.14	.963	78
An integrated system due to advanced automation system can improve the import and export activities of the country	4.22	.767	78
An improved technology system can easily identify where problems arise	4.04	.918	78
Using the various data gathered from the different systems advanced technologies can help in improve the forecasting process	3.95	.866	78
An advanced technology would create a better service to the customers of the organization	4.12	1.206	78

Source: (Survey data May, 2023)

In the above table 4.5 the respondent's mean response is above 3.50 therefore, they have agreed or strongly agreed that applying advanced technology will help in improving the overall integration between shipping systems. From the above response it is observed that improved system integration will lead to a better performance and flow of information within the organization. As information and data are critical in the shipping industry and blockage due to lack of integration would be catastrophic so having an advanced automated system will help in creating a better synergy between systems and having a harmonious system will support the various logistics activities done within the organization to come to a higher level so that the logistics performance of the company would be great starting from the booking step until the items are delivered in time to the customers without any defects and delays.

Table 4.6: Mean and Std deviation of responses in improving delivery time

Effect in improving cargo delivery time	mean	Std. Deviation	N
On time and in full delivery can be achieved with improved technologies all times	3.85	.955	78
Real time tracking of in transit shipments on 24/7 mobile applications can help customers easily track their shipment	4.08	.950	78
Digital alerts and updates of each process time within the system can help improve the delivery time	3.99	1.063	78
Digitally managed transportation system from dock to the various dry ports can help improve the delivery time	4.09	.996	78

Faster loading and vehicle matching can reduce truck turnaround time and hence delivery time if advanced technologies are applied on the trucks	4.06	.972	78
Mapping routes in real time through advanced software can help avoid unnecessary delays	4.00	.953	78
Improved and vast warehousing systems equipped with advanced technological gadgets can help improve the delivery time	4.10	.847	78
Advanced software can easily integrate the various transport modalities easily to work together so that better delivery time is achieved.	4.19	.884	78

Source: (Survey data May, 2023)

In terms of improving cargo delivery time based on the application of advanced technology it is seen from the respondents most of them agree with this showing a mean score of above 3.50 as depicted on table 4.6. At the end of the day the main aim of the shipping industry is to deliver the consignments it took under it to its clients in time and in full (OTIF) and having an advanced automated technology will help accordingly based on the response received from the respondents. And having an integrated system will push for a better service since the integration is supported by an automated system and having this integration will help deliver items with in time without any defects or damages. Putting the above statement in to perspective it will also help minimized cost and improve the net income of the company which helps it grow in a better way when compared to other liners.

4.4.2. Response to current level of logistics performance at ESLSE

Table 4.7: Mean and Std deviation of responses to current logistics performance

Level of Logistics performance at ESLSE	mean	Std. Deviation	N
Transportation cost both inland and at sea	3.50	.679	78
Clearance and port due cost	3.29	.705	78
Warehousing, loading and unloading cost	3.18	.769	78
Various documentation costs	3.04	.746	78
Maintaining on time and in full delivery	2.56	.920	78
Total time spent by truck in the terminal area	3.22	.696	78
Maintaining real time information and data	2.76	.969	78
Overall logistics performance of ESLSE	3.49	.950	78

Source: (Survey data May, 2023)

To be able to observe the respondents' perception on the current logistics performance at ESLSE 5 point Likert scale was employed which is: 1- Very Low, 2- Low, 3- Neutral, 4- High, and 5- Very High. Again the score range (M) of 0 to 1.5 means respondents have a very low opinion, score 1.50 to 2.50 means respondents have low opinion, results 2.50 to 3.50 shows respondents have a neutral stance, 3.50 to 4.5 means respondents think the performance of the company is high, and above 4.50 indicating very high performance. Therefore, it can be

seen in the above table 4.7 that most among the participates have shown they have a neutral stand as to the level of current logistics performance of ESLSE with most of them scoring between the parameter of 2.50 to 3.50. From the financial reports which is annexed at the end of this paper dating from 2018/19-2021/22 it is seen that the Enterprise is performing well with net profit increasing from year to year but still the there is an increment in the cost of the company as well . Even though, the profitability of the company is seen still the majority of the respondents have shown a neutral to low in their opinion and this show that the actual logistics performance of the company is not championed by its own employees which is an implication that customers are not served well or an improvement is needed in the automation of its systems in order to improve its services when it comes to the ground level. At the end of the day as a service giving organization its aim is to satisfy its clients to the fullest level without affecting its income, without extra cost and with better improved system integration in general.

4.5. Inferential Statistics

4.5.1. Correlation Analysis

The linear link between two variables is measured via correlations. The range of a correlation coefficient's value is from -1 to 1. Closer values to the absolute value of 1 suggest a strong association between the variables being correlated, whereas closer values to 0 indicate a weak or nonexistent relationship. According to Pallant (2005), the correlation is a widely used indicator of the magnitude of an effect, with values of ± 0.1 denoting a little influence, ± 0.3 denoting a medium effect, and ± 0.5 denoting a strong effect.

This section includes a correlation analysis that was carried out in light of each research objective and set of produced hypotheses. Correlation analysis was used to examine the connection between supply chain management strategy and firm performance. This gave correlation coefficients, which showed the relationship's strength and direction. The p-value also displayed the likelihood that this link would be significant..

Table 4.8: Correlation Analysis between technological advancement and its effect in maximizing net profit

		Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	Q 7	Q 8
Q 1	Pearson Correlation	1	.777**	.734**	.574**	.882**	.868**	.861**	.775**
	Sig (2- tailed)		.000	.000	.000	.000	.000	.000	.000
	N	78	78	78	78	78	78	78	78
Q2	Pearson Correlation	.777**	1	.632**	.656**	.739**	.859**	.874**	.821**
	Sig (2- tailed)	.000		.000	.000	.000	.000	.000	.000
	N	78	78	78	78	78	78	78	78

Q 3	Pearson Correlation	.734**	.632**	1	.565**	.785**	.760**	.711**	.690**
	Sig (2- tailed)	.000	.000		.000	.000	.000	.000	.000
	N	78	78	78	78	78	78	78	78
Q 4	Pearson Correlation	.574**	.656**	.565**	1	.679**	.745**	.674**	.562**
	Sig (2- tailed)	.000	.000	.000		.000	.000	.000	.000
	N	78	78	78	78	78	78	78	78
Q 5	Pearson Correlation	.882**	.739**	.785**	.679**	1	.879**	.849**	.736**
	Sig (2- tailed)	.000	.000	.000	.000		.000	.000	.000
	N	78	78	78	78	78	78	78	78
Q 6	Pearson Correlation	.868**	.859**	.760**	.745**	.879**	1	.895**	.804**
	Sig (2- tailed)	.000	.000	.000	.000	.000		.000	.000
	N	78	78	78	78	78	78	78	78
Q7	Pearson Correlation	.861**	.874**	.711**	.674**	.849**	.895**	1	.880**
	Sig (2- tailed)	.000	.000	.000	.000	.000	.000		.000
	N	78	78	78	78	78	78	78	78
Q 8	Pearson Correlation	.775**	.821**	.690**	.562**	.736**	.804**	.880**	1
	Sig (2- tailed)	.000	.000	.000	.000	.000	.000	.000	
	N	78	78	78	78	78	78	78	78

** . Correlation is significant at the 0.01 level (2-tailed). Source: (SPSS output 2023)

Based on the table above the eight questions raised will show us the relationship or correlation with each other in showing the effect on maximizing net profit. It is seen that there is a strong correlation between technological advancement and its effect on maximizing net profit. Each of the eight questions asked on the during data collection shows high significance at 0.000, which show that 100% level of confidence in the relationship between the two examined variables. Like for example, having a digital platform for customers has a positive correlation with applying new technically advanced system to attract new market which is ($r=.632$) and so on with this it can be seen that positive correlation is set on this ground.

Table 4.9: Correlation Analysis between technological advancement and its effect in minimizing cost

		Q 9	Q 10	Q 11	Q 12	Q 13	Q 14	Q 15	Q 16
Q 9	Pearson Correlation	1	.777**	.734**	.574**	.882**	.868**	.861**	.775**
	Sig (2- tailed)		.000	.000	.000	.000	.000	.000	.000
	N	78	78	78	78	78	78	78	78
Q10	Pearson Correlation	.777**	1	.632**	.656**	.739**	.859**	.874**	.821**
	Sig (2- tailed)	.000		.000	.000	.000	.000	.000	.000
	N	78	78	78	78	78	78	78	78
Q 11	Pearson Correlation	.734**	.632**	1	.565**	.785**	.760**	.711**	.690**
	Sig (2- tailed)	.000	.000		.000	.000	.000	.000	.000

	N	78	78	78	78	78	78	78	78
Q 12	Pearson Correlation	.574**	.656**	.565**	1	.679**	.745**	.674**	.562**
	Sig (2- tailed)	.000	.000	.000		.000	.000	.000	.000
	N	78	78	78	78	78	78	78	78
Q 13	Pearson Correlation	.882**	.739**	.785**	.679**	1	.879**	.849**	.736**
	Sig (2- tailed)	.000	.000	.000	.000		.000	.000	.000
	N	78	78	78	78	78	78	78	78
Q 14	Pearson Correlation	.868**	.859**	.760**	.745**	.879**	1	.895**	.804**
	Sig (2- tailed)	.000	.000	.000	.000	.000		.000	.000
	N	78	78	78	78	78	78	78	78
Q15	Pearson Correlation	.861**	.874**	.711**	.674**	.849**	.895**	1	.880**
	Sig (2- tailed)	.000	.000	.000	.000	.000	.000		.000
	N	78	78	78	78	78	78	78	78
Q 16	Pearson Correlation	.775**	.821**	.690**	.562**	.736**	.804**	.880**	1
	Sig (2- tailed)	.000	.000	.000	.000	.000	.000	.000	
	N	78	78	78	78	78	78	78	78

**. Correlation is significant at the 0.01 level (2-tailed). Source: (SPSS output 2023)

Considering the outcome above in relation to effects in minimizing cost as to application of advanced technology to perform various logistics activities it is observed that it has a strong correlation between each question raised with in this section. Each and every question has a positive correlation with each other with a 100% confidence level. Like assigning the right personnel for the right job has a strong correlation with having advanced digital solution which can reduce the overall cost of the organization with ($r=.849$). And it is observed on the other variables in relation to minimizing the cost of the organization.

Table 4.10: Correlation Analysis between technological advancement and its effect in improving the overall integration between shipping systems

		Q 17	Q 18	Q 19	Q 20	Q 21	Q22	Q23	Q 24
Q 17	Pearson Correlation	1	.508**	.430**	.370**	.394**	.657**	.501**	.577**
	Sig (2- tailed)		.000	.000	.001	.000	.000	.000	.000
	N	78	78	78	78	78	78	78	78
Q18	Pearson Correlation	.508**	1	.830**	.846**	.284*	.843**	.687**	.800**
	Sig (2- tailed)	.000		.000	.000	.012	.000	.000	.000
	N	78	78	78	78	78	78	78	78
Q 19	Pearson Correlation	.430**	.830**	1	.795**	.247*	.630**	.552**	.563**
	Sig (2- tailed)	.000	.000		.000	.029	.000	.000	.000
	N	78	78	78	78	78	78	78	78
Q 20	Pearson Correlation	.370**	.846**	.795**	1	.151	.728**	.553**	.735**
	Sig (2- tailed)	.001	.000	.000		.186	.000	.000	.000

	N	78	78	78	78	78	78	78	78
Q 21	Pearson Correlation	.394**	.284*	.247*	.151	1	.412**	.427**	.338**
	Sig (2- tailed)	.000	.012	.029	.186		.000	.000	.003
	N	78	78	78	78	78	78	78	78
Q 22	Pearson Correlation	.657**	.843**	.630**	.728**	.412**	1	.770**	.864**
	Sig (2- tailed)	.000	.000	.000	.000	.000		.000	.000
	N	78	78	78	78	78	78	78	78
Q23	Pearson Correlation	.501**	.687**	.552**	.553**	.427**	.770**	1	.752**
	Sig (2- tailed)	.000	.000	.000	.000	.000	.000		.000
	N	78	78	78	78	78	78	78	78
Q 24	Pearson Correlation	.577**	.800**	.563**	.735**	.338**	.864**	.752**	1
	Sig (2- tailed)	.000	.000	.000	.000	.003	.000	.000	
	N	78	78	78	78	78	78	78	78

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

*, Correlation is significant at the 0.05 level (2-tailed). Source: (SPSS output 2023)

In the above table it seen that a strong correlation is observed with the questions raised to support the notion of technological advancement in improving the overall integration between shipping systems. In relation to boosting order processing time within each department and the integrated system improving the import and export activities there is a positive correlation but with 95% confidence where ($r=.284$). The same goes on with the follow of information among departments to have a 95% correlation with improving the import and export activities within the organization having ($r=.247$). The correlation between the different departments response time to be improved is positive with the improvement of the import and export of the organization but it is insignificant since ($r=.151$).

Table 4.11: Correlation Analysis between technological advancement and its effect in improving cargo delivery time

		Q 25	Q 26	Q 27	Q 28	Q 29	Q30	Q31	Q 32
Q 25	Pearson Correlation	1	.643**	.561**	.725**	.767**	.671**	.711**	.698**
	Sig (2- tailed)		.000	.000	.000	.000	.000	.000	.000
	N	78	78	78	78	78	78	78	78
Q26	Pearson Correlation	.643**	1	.605**	.692**	.571**	.631**	.571**	.477**
	Sig (2- tailed)	.000		.000	.000	.000	.000	.000	.000
	N	78	78	78	78	78	78	78	78
Q 27	Pearson Correlation	.561**	.605**	1	.786**	.529**	.525**	.478**	.404**
	Sig (2- tailed)	.000	.000		.000	.000	.000	.000	.000
	N	78	78	78	78	78	78	78	78
Q 28	Pearson Correlation	.725**	.692**	.786**	1	.732**	.739**	.605**	.615**

	Sig (2- tailed)	.000	.000	.000		.000	.000	.000	.000
	N	78	78	78	78	78	78	78	78
Q 29	Pearson Correlation	.767**	.571**	.529**	.732**	1	.841**	.718**	.727**
	Sig (2- tailed)	.000	.000	.000	.000		.000	.000	.000
	N	78	78	78	78	78	78	78	78
Q 30	Pearson Correlation	.671**	.631**	.525**	.739**	.841**	1	.837**	.848**
	Sig (2- tailed)	.000	.000	.000	.000	.000		.000	.000
	N	78	78	78	78	78	78	78	78
Q31	Pearson Correlation	.711**	.571**	.478**	.605**	.718**	.837**	1	.946**
	Sig (2- tailed)	.000	.000	.000	.000	.000	.000		.000
	N	78	78	78	78	78	78	78	78
Q 32	Pearson Correlation	.698**	.477**	.404**	.615**	.727**	.848**	.946**	1
	Sig (2- tailed)	.000	.000	.000	.000	.000	.000	.000	
	N	78	78	78	78	78	78	78	78

** . Correlation is significant at the 0.01 level (2-tailed). Source: (SPSS output 2023)

In the above table it shown that there is a positive correlation between each question raised to see the effects of technologically advanced system in improving the cargo delivery time of ESLSE. Like on time and if full delivery can be achieved with advanced technology correlates with the real time tracking of transit shipments 24/7 with a value of ($r=.643$) which is positive and a 100% significant with two stars.

In the above correlation it is observed most of the Pearson correlations score are above ± 0.5 which shows a strong effect and the significance level for most of the factors is 100% with some instances 95% with one star observed. And this implicates there is a strong relation between each factors in relation to this study to be conducted. An advanced automated technology has a strong relationship with maximization of profitability, minimization of cost, improvement of system integration and improvement of cargo delivery time.

4.5.2. Regression Analysis

The purpose of this regression analysis is to determine the degree to which the independent variable accounts for the dependent variable. The regression was conducted between improving the overall income performance of the organization (dependent variable), overall cost minimization performance (dependent variable) of the company, improving overall integration between shipping systems (dependent variable) and the last is to see the effect on on time and in full delivery performance improvement (dependent variable) the above dependents variables are seen against the application of new advanced technologies especially on automation of activities with in the ESLSE as an independent element. The regression analysis is a linear type and for the Coefficients ansys 95% confidence interval for B is used.

Table 4.12: Regression model between application of advanced technology and profit maximization

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.904 ^a	.817	.798	.381

a. Predictors: (Constant), Question8, Question4, Question3, Question1, Question5, Question6, Question7. Source: (SPSS output 2023)

As shown in table 4.12, there is an association between maximizing net profit and implementing advanced technological systems. The effect in implementing advanced automated technology has 81.7% effect on improvement of the overall income of the organization. Therefore, those dimensions are unable to account for the remaining 18.3% of the variation. So the R square value can be attributed to the implementation of advance technologies.

Table 4.13: ANOVA result between application of advanced technology and profit maximization

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	45.196	7	6.457	44.530	.000 ^b
	Residual	10.150	70	.145		
	Total	55.346	77			

a. Dependent Variable: Question2

b. Predictors: (Constant), Question8, Question4, Question3, Question1, Question5, Question6, Question7
Source: (SPSS output 2023)

Table 4.14: Regression Coefficients between application of advanced technology and profit maximization

Model	Coefficients ^a						
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	1.509	.332		4.545	.000		
Q 1	.066	.131	.066	.502	.617	.152	6.587
Q 3	-.080	.102	-.068	-.781	.438	.343	2.913
Q 4	.061	.071	.070	.857	.395	.395	2.535
Q 5	-.177	.111	-.217	-1.590	.116	.140	7.130
Q 6	.336	.112	.455	2.994	.004	.113	8.824
Q 7	.319	.120	.414	2.659	.010	.108	9.254
Q 8	.168	.091	.207	1.844	.069	.207	4.829

a. Dependent Variable: Question2

In the above table 4.13, the ANOVA result indicates a value of 0.000 demonstrates the importance of the regression relationship in determining how technological improvement would affect logistics performance in terms of optimizing an organization's net profit it has a strong influence on profit maximization. The F value shows 44.530 a higher value which shows the model is significant.

In the above table 4.14 it is observed that technologically improved data storage and sharing platforms will have a better impact in maximizing the income and hence the profitability of the company. The significance level for this is below .04 which is .004. Furthermore, Optimization of routs through predictive analytics can help improve the revenue of ESLSE with its significance level below .05 which registered .010 in this scenario. With regards to co linearity between independent variables the tolerance for each are greater than 0.1 and the VIF is below 10. Pallant (2005), and hence we can conclude that there is now co linearity with in the above data.

Table 4.15: Regression model between application of advanced technology and cost minimization

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.933 ^a	.870	.857	.386

a. Predictors: (Constant), Question16, Question14, Question10, Question9, Question13, Question11, Question12. Source: (SPSS output 2023)

Table 4.15 shows that the effect of minimizing the overall cost in relation to adopting new advanced automated technology is around 87% and the rest of 13% variation is expected from another source. Consequently, this demonstrates that there is a connection between minimizing cost and introducing advanced technology to the organization.

Table 4.16: ANOVA result between application of advanced technology and cost minimization

ANOVA ^a					
Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	70.226	7	10.032	67.180	.000 ^b
Residual	10.453	70	.149		
Total	80.679	77			

a. Dependent Variable: Question15

b. Predictors: (Constant), Question16, Question14, Question10, Question9, Question13, Question11, Question12. Source: (SPSS output 2023)

Table 4.17: Regression Coefficients between application of advanced technology and cost minimization

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-.632	.250		-2.528	.014		
Q 9	.150	.050	.176	2.983	.004	.529	1.889
Q 10	.533	.109	.517	4.884	.000	.165	6.054
Q 11	-.370	.087	-.353	-4.232	.000	.265	3.768
Q 12	-.046	.100	-.046	-.454	.651	.181	5.536
Q 13	-.011	.079	-.010	-.136	.892	.370	2.705
Q 14	.689	.063	.673	10.889	.000	.484	2.066
Q16	.206	.079	.211	2.597	.011	.281	3.562

a. Dependent Variable: Question2

In the above table 4.16 it is seen that the F is 67.180 which is very which the significance lever to be very acceptable 0.000. This provides the fact that the implementation of advanced technology will have a significant role in the minimizing of cost since it is one section which shows the logistics performance of the organization.

In table 4.17 automating manual and repetitive tasks will has a significant impact in minimizing cost of the company with a score of below .05 which is .004. Both setting an online self-service application and applying advanced automated material handling equipment and having an automated tracking system in Q10, Q11 & Q14 respectively have a significance level of .000 which is lower than .05. And all three factors have an impact in minimizing the company's cost. And lastly with significance score of .011 is the application of digital tracking and identification of consignments which help set a minimized cost for ESLSE. In the co linearity section the tolerance level are all greater than 0.1 and the VIFs' are not greater than 10 therefore, the co-linearity of independent is registered to be low. Pallant (2005)

Table 4.18: Regression model between application of advanced technology and overall shipping system integration

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.907 ^a	.823	.805	.532

a. Predictors: (Constant), Question23, Question21, Question17, Question20, Question19, Question22, Question18. (SPSS output 2023)

In the above table its shows that 82.3% attributed to improving the overall integration between shipping systems up on adopting new advance technology. This shows there is a relationship between integration and introducing advanced technology at ESLSE.

Table 4.19: ANOVA result between application of advanced technology and overall shipping system integration

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	92.143	7	13.163	46.493	.000 ^b
	Residual	19.819	70	.283		
	Total	111.962	77			

a. Dependent Variable: Question24

b. Predictors: (Constant), Question23, Question21, Question17, Question20, Question19, Question22, Question18. (SPSS output 2023)

Table 4.20: Regression Coefficients between application of advanced technology and shipping system integration

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-1.351	.463		-2.916	.005		
Q 17	.183	.107	.121	1.708	.092	.507	1.974
Q 18	.364	.163	.318	2.224	.029	.124	8.073
Q 19	-.406	.117	-.356	-3.462	.001	.239	4.184
Q 20	.447	.134	.357	3.337	.001	.221	4.523
Q 21	.016	.093	.010	.168	.867	.724	1.381
Q 22	.380	.173	.289	2.190	.032	.145	6.889
Q 23	.341	.114	.245	2.996	.004	.378	2.646

a. Dependent Variable: Question 24

As can be observed in the above table 4.19, the regression connection is significant in integrating the total shipping system by enhancing or introducing cutting-edge automated technology within the firm, as indicated by the significance value of 0.000. The ANOVA table's F ratio evaluates how well the regression model fits the data, and its F value of 46.493 indicates that the model is significant.

In table 4.20 to the co linearity of the factors the tolerance level is greater than 0.1 and the VIF is below 10 therefore, low co linearity is observed in this area Pallant (2005). With a significant level of .001 below .05 using enhanced automated system to better the flow of information and with the help of improved technology response time for department will be improved have a significant impact in improving the system integration with in ESLSE. Setting up automated system to gather data for better forecasting process has also better impact on overall system integration with significance value of .004. Lastly advanced technology application can help boost order processing time and also can easily identify where problems arrange with a significance level of .029 and .032 respectively, both can have vital impact in the integration of shipping systems.

Table 4.21: Regression model between application of advanced technology and improving cargo delivery time

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.863 ^a	.745	.720	.505

a. Predictors: (Constant), Question32, Question27, Question26, Question29, Question28, Question30, Question31. (SPSS output 2023)

Table 4.22: ANOVA result between application of advanced technology and improving cargo delivery time

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	52.271	7	7.467	29.230	.000 ^b
	Residual	17.883	70	.255		
	Total	70.154	77			

a. Dependent Variable: Question25

b. Predictors: (Constant), Question32, Question27, Question26, Question29, Question28, Question30, Question31. (SPSS output 2023)

In table 4.21 it shows that 74.5% is attributed to improving delivery time by applying advanced technology system which implies relative contribution on the fact that new advanced technology will improve the delivery time. And the rest of 25.5% also is attributable to other reasons outside the change in the change. On table 4.22 the F value is higher and the value 0.000 indicates that the regression relationship is significant in predicting the effects of advanced technology on the logistics performance in terms of cargo delivery time.

Table 4.23: Regression Coefficients between application of advanced technology and improving cargo delivery time

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-.433	.323		-1.338	.185		
Q 26	.253	.097	.251	2.610	.011	.393	2.548
Q 27	-.009	.097	-.010	-.097	.923	.314	3.186
Q 28	.261	.137	.273	1.905	.061	.177	5.635
Q 29	.524	.116	.533	4.535	.000	.263	3.799
Q 30	-.575	.157	-.574	-3.662	.000	.148	6.745
Q 31	.202	.253	.179	.799	.427	.072	13.853
Q 32	.371	.249	.344	1.489	.141	.068	14.622

a. Dependent Variable: Question 24

In the above table 4.23 by applying an automated technology for faster loading and vehicle matching helps in improving truck turnarounds to save time and hence improving delivery time. In addition using real time data to map routes through advanced system can help unnecessary delays and delivery can be enhanced. Both factors registered a significant level of .000 which is lower than .05 and therefore, they have significant impacts on improving cargo delivery time. Real time tracking for transit shipments 24/7 with the aid of advanced mobile application can help customers to trace their shipments easily and with this respect can improve the cargo delivery time in addition to providing up-to-date information for ESLSE clients. In relation to collinearity the tolerance levels are all above 0.1 and the VIF values are all below 10 to make them acceptable. Except two scenarios above 10 are registered which are the issue related to improve and vast warehousing systems and advanced software to integrate various transport modalities have higher collinearity which put them in a position not predict the dependent variable by their own.

5. SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATION

5.1. Summary of Major Finding

The results of the data analysis in the preceding section are summarized as follows;

- The majority responses on the effect on maximizing net profit have an average score higher than 4.5, which imply the respondents agreed or strongly agreed that to the fact that the company actually will be able to increase profit based on applying new advanced automated technology. Improved data storage and sharing platforms along with optimization of routs through predictive analysis can improve the net profit of ESLSE with significance level below .05 on the regression coefficient analysis.
- In relation to minimizing cost the majority of the responses have a mean score greater than 3.5 which shows that applying advanced technologies like for example automating manual and repetitive tasks or developing online self-service applications and the like will help in minimizing the overall cost of ESLSE. In the regression coefficient analysis with a score below .05 self-service applications, automated material handling equipment, better tracking systems in addition with digital tracking and identification system for consignments have high significance in minimizing the overall cost of the company.
- Coming to improving the overall integration between shipping systems the agreeability of the respondents is observed in the fact that applying advanced technology will help in integrating the overall shipping systems. And the mean score seen again is above 3.5. Using enhanced automated system, setting up automated systems to gather data and in order to increase order processing advanced technology has an impact in improving shipping system integration.
- In relation to improving cargo delivery time a mean score of 3.5 is observed which shows applying advanced technology will have an effect in improving cargo delivery time so that on time in full delivery is achieved at all times. With a score below .05 usages of real time data to map out routs and applying automated system to enhance faster loading and vehicle assignment will improve the overall cargo delivery time.
- With regards to the current logistics performance of the company most of the respondents replied in the range of mean score 2.5-3.50, which shows that most of the respondents have a neutral stance on the current logistics performance of ESLSE quite a few have either gone to the very high side or the very low side. Despite the fact that the financial performance of ESLSE shows the company is having a good performance but still its employees are not confident level the level of logistics performance is at the highest level.

- In relation to the correlation relations on the various parameters strong positive correlation is observed in relation to effect in maximizing net profit due to application of advanced technologies with 100% confidence level. With r value scoring positive points with this regards.
- The correlation relation in the effects in minimizing the cost in accordance of applying an advanced technology also has a positive correlation with 100% confidence level. Assigning the right personnel for the right job has a strong correlation with having advanced digital solution which can reduce the overall cost of the organization with ($r=.849$).
- With respect of improving the overall integration between shipping systems strong positive correlation is observed in most activities with 100% confidence level. But in some instances relating to boosting order processing time within each department and the integrated system improving the import and export activities there is a positive correlation but with 95% confidence where ($r=.284$). The same goes on with the follow of information among departments to have a 95% correlation with improving the import and export activities within the organization having ($r=.247$).
- Strong positive correlation is observed in improving cargo delivery time as a result of implementing advanced technology with ESLSE. Like on time and if full delivery can be achieved with advanced technology correlates with the real time tracking of transit shipments times with a value of ($r=.643$) which is positive and a 100%.

5.2. Conclusion

The following conclusions are drawn from the study's findings and a synopsis of them;

From the respondents feedback most of them believe applying advanced technologies in the areas of providing real time information, improved data storage and sharing platforms and the like will have an impact in maximizing the net profit of ESLSE. In addition, automation of manual and repetitive tasks and online self-service applications and other materials will help minimize the overall cost in relation to the company. And the application of advanced technologies will also have a good impact in improving the overall integration between shipping systems and eventually will create a better service to its customers after all the end result is to have a satisfied customers. Finally an advanced technology will help improve cargo delivery time by enhancing the on time and in full delivery for its customer and real time updates and information are passed to its customers at the right time and place.

Furthermore, it is observed the overall aim of ESLSE is to improve its services to its customers by improving delivery time in terms of full delivery and on time delivery and in order to achieve this application advance technology will help but without minimizing the cost of the company and improving the overall integration

between shipping systems achieving this might be difficult in doing so when the cost is minimized and integration improved the consignment delivery time will also improve which in turn will help in maximizing the Company's net profit.

5.3. Recommendation

As a way to close the gaps found, several recommendations are put forth based on the study results and conclusions stated above;

- It is observed from the responses most of the respondents are not confident about the current logistics performance of ESLSE with most of them having a neutral or below neutral stand which shows improvement is needed in the overall logistics performance of the company. And one of the means is to apply an advanced technology which can build a communication platform between customers and the company which help provide real time information about the consignments customers are tracking or are planning to load accordingly.
- It is advised to implement a self-serve application which can be accessed by customers and ESLSE workers so that it would make it easy for customers to easily book, make payments, track their shipment, and get online immediate support from any place at any time. At this day and age most of the activities are done from the palm of our hands and tapping in to this opportunity will help ESLSE workers to focus more strategic works rather than repetitive unnecessary clerical activities.
- It is observed most of the activities done with in ESLSE are manual like for example payment activities even though the payment is done at banks again paper works need to be brought back to head office to be confirmed and this takes valuable time in the logistics performance. It is suggested that if a separate online payment confirmation system is adopted to confirm the payment it would save time, minimize cost and improve logistics performance by a good margin.
- One of the challenges in the logistics performance is to easily track consignments with in containers or locate them once they have arrived at dry port or are in transit. If a better tracking system is applied within the organization instead of manually feeding them on the system it would be time saving and real time information will be given to customers since their consignments or containers will be tagged and tracked easily from arrival or going to Djibouti port.
- It is advised for each shipping systems involved with the movement of consignments to be integrated online so that booking, loading and unloading, payment, endorsement and the like are visible on one system so that unnecessary paper works are avoided and clear and on time information is transmitted thorough the shipping system and the information needed are also transmitted to the customer in good time for them to be ready for their consignments.

- In order to foster logistics performance to the highest level ESLSE must reconsider its overall activities so that better services are provided to customers and one of the means is to adopt an improved technology in terms of online mobile applications, better integrated systems, online confirmation systems whether it is payments or endorsements and the like. A strong evaluation of the organizations system must be seen and must be brought to the latest version to improve the overall performance of ESLSE.
- One of the best platforms for improvement is competition currently ESLSE is the sole provider of the service unless otherwise a special waiver is received from ESLSE or a permanent waiver which is rare is received. Therefore, the Government must consider introducing other shipping providers so that ESLSE will be able to compare its services with other service providers in the industry and update its services so that its customers are served to the highest level of logistics performance.

5.4. Suggestion for Future Study

Currently ESLSE is the sole service provider in the country and it has come a long way in improving its services and destination. But still there is always room for improvement at the end of the day the main aim of the company is to provide the best service. As their vision states “By providing competitive shipping & logistics services, to become preferred and renowned African logistics company by 2025.” In order to achieve this various technological advanced systems and procedures must be set out. And this study tried to see from a few angle like the implementation of online platform for better communication, better system integration through bettered technology and the like. Therefore, this study will help to be a platform in furthering the study so that ESLSE can be able to provide a better service and achieve its vision in the allotted time frame.

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APPENDIX



ADDIS ABABA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

SCHOOL OF COMMERCE

DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT

Questionnaire

Dear Respondent,

I'm an MA student at Addis Ababa University School of Commerce in the Department of Logistics and Supply Chain Management. I have been doing a research/thesis on **The effect of Technological advancement on Logistics Performance; In the Case of the ESLSE** for the partial fulfillment of masters of Arts in logistics and supply chain management. Currently, I am collecting data using the enclosed questionnaire that will be used for purpose of my research thesis. I believe that your experiences and knowledge as a staff of Ethiopian shipping and logistics services enterprise are extremely useful to the success of this data collection phase of my research/thesis. Thus, I kindly request your cooperation to complete the questionnaire. Filling the questionnaire may take you about 15 to 20 minutes of your precious time only.

Thanking you for your time and willingness to participate in the study, I would like to inform you that your participation is voluntary; and all your responses will be kept with strict anonymous and confidential. Besides, the research/thesis output/result will be used for the academic purpose only.

Please use my cell phone number +251 944 31 35 55/911 64 28 72/+971 50 9647772 for any inquiry. Thank you in advance for your cooperation.

Sincerely,
Amanuel Fikru

PART ONE: BACKGROUND INFORMATIONS OF RESPONDENTS

Please tick the appropriate one (✓)

1. Sex: Male_____ Female_____
2. Age: < 25_____ 26-35 _____ 36-45_____ Above 45 _____
3. Work Experience: 1-5 Year _____ 6-10 Year _____ 11-15 year_____ > 15 year_____
4. Education Level: Diploma_____ Degree _____ Masters _____ Phd _____

PART TWO: ESLSE'S LOGISTICS PERFORMANCE INDICATORS/ QUESTIONNAIRE

1. Show Your Level of Agreement on the following logistics performance in Your Enterprise
Using the Following Rating Scales.

1; Strongly Disagree, 2; Disagree, 3; Neither, 4; Agree and 5; Strongly Agree

Please complete the following by placing a tick “✓” in one space only the numbers that best suits your level of agreement regarding logistics time, quality and cost as follows:

1=strongly disagree; 2=disagree; 3=neither agree nor disagree; 4=agree; 5=strongly agree

S.No	Effect in maximizing Net Profit	1	2	3	4	5
1	Innovative technologies will maximize the sales performance of ESLSE					
2	Having digital platform for customers will improve the overall income of your organization					
3	Applying new technological advancement will help gain new market shares in the industry					
4	Application of modern machine learning systems for better industry prediction can help improve sales					
5	Real-time information sharing with advanced technologies with customers will have an incremental factor on revenue.					
6	Technologically improved data storage and sharing platforms will have a better impact in maximizing revenue					
7	Optimizing routes through big data and predictive analytics can help increase the revenue of the organization					
8	Setting up advanced software can help set competitive price by reducing cost and eventually increasing overall revenue					
S.No	Effect in minimizing Cost	1	2	3	4	5

1	Automating manual and repetitive tasks will lower the cost incurred with in the organization					
2	Developing an online self-service application for customers will help in minimizing the cost of the company					
3	Application of advanced material handling equipment helps delivery of items without damage					
4	Using online data storage and sharing mechanism will help reduce the cost of stationary and can help the organization to go green					
5	Advanced technologies can help assign the right personnel for the right job in a effective and efficient manner by freeing them from manual and repetitive tasks					
6	Better tracking systems can best help track the assets of ESLSE in an organized manner and get the best benefit out of them with minimum cost					
7	Advanced digital solutions can reduce the overall cost of the organization					
8	Digital tracking and identification of consignments at ports in short period of time can help reduce the cost of the organization					
S.No	Effects in improving the overall integration between shipping systems	1	2	3	4	5
1	Having fast and actual information sharing platform with in the organization help in upgrading the performance of the various parties with in the system					
2	Advanced technologies can help in boosting order processing time with in each department					
3	The flow of information among departments will be bettered with the use of enhanced automated system					
4	Improved technology will help the different department's response time to challenges in an integrated manner					
5	An integrated system due to advanced automation system can improve the import and export activities of the country					
6	An improved technology system can easily identify where problems arise					
7	Using the various data gathered from the different systems advanced technologies can help in improve the forecasting process					
8	An advanced technology would create a better service to the customers of the organization					
S.No	Effects in improving cargo delivery time	1	2	3	4	5
1	On time and in full delivery can be achieved with improved technologies all times					
2	Real time tracking of in transit shipments on 24/7 mobile applications can help customers easily track their shipment					
3	Digital alerts and updates of each process time within the system can help improve the delivery time					
4	Digitally managed transportation system from dock to the various dry ports can help improve the delivery time					

5	Faster loading and vehicle matching can reduce truck turnaround time and hence delivery time if advanced technologies are applied on the trucks					
6	Mapping routes in real time through advanced software can help avoid unnecessary delays					
7	Improved and vast warehousing systems equipped with advanced technological gadgets can help improve the delivery time					
8	Advanced software can easily integrate the various transport modalities easily to work together so that better delivery time is achieved.					

2. For the following items, please rate ESLSE logistic performance based various parameters by the following metrics.

1; Very low, 2; Low, 3; Neutral, 4; High and 5; Very high

S. N	Level of logistics performance at ESLSE	1	2	3	4	5
1	Transportation cost both inland and at sea					
2	Clearance and port due cost					
3	Warehousing, loading and unloading cost					
4	Various documentation costs					
5	Maintaining on time and in full delivery					
6	Total time spent by truck in the terminal area					
7	Maintaining real time information and data					
8	Overall logistics performance of ESLSE					

**ETHIOPIAN SHIPPING AND LOGISTICS SERVICES ENTERPRISE STATEMENT OF
COMPREHENSIVE INCOME FOR FOUR YEARS THE YEAR ENDED 2018/19-2021/22**

In '000 Birr

	For year 2018/19	For year 2019/20	For year 2020/21	For year 2021/22
Gross revenue	18,741,500	25,806,199	29,717,501	51,383,276
Operating expenses	(15,967,463)	(22,196,297)	(25,919,653)	(43,775,958)
Gross operating profit	2,774,038	3,609,902	3,797,848	7,607,318
Other income	9,563	21,479	84,012	20,335
	2,783,601	3,631,381	3,881,860	7,627,653
Total adm. And gen. Exp	(1,070,272)	(1,075,160)	(1,204,220)	(1,991,682)
Profit before tax	1,713,328	2,556,221	2,677,640	5,635,972
Profit tax	382,209	416,231	801,884	825,285
Net Income	1,331,119	2,139,990	1,875,756	4,810,686
Transfer to legal reserve	66,556	106,999	93,788	240,534
Transfer to state capital	1,264,564	2,032,990	1,781,968	4,570,152

Source: ESLSE (2022)

ETHIOPIAN SHIPPING AND LOGISTICS SERVICES ENTERPRISE ANNUAL FOR OPERATING COST AND ADMISTRATIVE EXPENCES FOR FOUR YEAR

In '000 Birr

	Particulars	2018/2019	2019/2020	2020/2021	2021/2022
1	OWN VESSELS				
1.1	<u>RUNNING COSTS - OWN VESSELS</u>				
	1.11 SALARIES AND ALLOWANCES	328,568	390,002	509,844	657,465
	1.12 CREW COST (MT,OCS,TRVL & WG)	25,122	27,568	47,899	60,674
	1.13 TECHNICAL COSTS	276,609	147,046	409,040	217,268
	1.14 SUPPLIES	120,601	127,547	165,517	181,456
	1.15 INSURANCE	53,359	52,358	61,882	9,881
	1.16 COMMUNICATION	14,402	8,148	10,314	79,395
	1.17 DEPRICATION	357,010	357,010	356,784	14,448
	1.18 SHIP HUSBANDARY	12,231	10,587	11,736	356,954
	1.19 OTHERS	10,745	9,843	9,185	10,959
	TOTAL	1,198,647	1,130,109	1,582,201	11,041
1.2	<u>VOYAGE COSTS - OWN VESSELS</u>				1,599,541
	1.21 PORT EXPENSE	110,966	128,737	163,873	
	1.22 AGENCY COMMISSION	87,992	101,999	115,956	201,674
	1.23 CARGO HANDLING	218,144	232,739	338,674	175,135
	1.25 FUEL	447,547	532,015	539,691	446,294
	1.25 CANAL	182,617	219,622	127,222	1,105,769
	1.26 CONTAINER RUNNING	82,886	64,408	-	-
	1.27 CONTAINER DEPRICATION	-	-	-	-
	1.28 CARGO INSURANCE	-	-	-	-
	1.29 COMMUNICATION	573	322	745	860
	1.30 OTHERS	559	889	2,110	3,511
	Sub-Total	1,131,284	1,280,732	1,288,271	1,990,681
	Total Own Vessels Costs	2,329,931	2,410,840	2,870,471	3,590,222
2	<u>SLOT EXPENSES</u>				
	2.1 SLOT HIRE	4,459,501	8,618,286	9,281,887	24,143,947
	2.2 CONTAINER RUNNING	357,667	417,703	844,655	539,916
	Sub-Total	4,817,168	9,035,988	10,126,542	24,683,862
	TOTAL	7,147,099	11,446,829	12,997,013	28,274,085
3	<u>FREIGHT FORWARDING</u>				
	3.1 CLEARING AND FORWARDING	405,502	1,634,592	1,964,261	6,202,138
	3.2 MULTI MODAL	7,870,746	8,614,389	10,378,910	8,508,322
	TOTAL	8,276,248	10,248,981	12,343,171	14,710,460
4	<u>PORT AND TERMINAL</u>				
	3.1 PORT AND TERMINAL COST	544,115	500,487	579,469	791,413
	TOTAL	544,115	500,487	579,469	791,413
	TOTAL OPERATING COSTS	15,967,463	22,196,297	25,919,653	43,775,958
5	<u>ADMINISTRATIVE EXPENSES</u>				
	4.1 PERSONEL COST	122,562	139,459	169,659	219,887
	4.2 CONTRACT WORK	4,788	7,616	9,217	16,880
	4.3 MATERIALS	15,419	13,374	16,261	11,023
	4.4 ALLOWANCE AND TRANSPORT	25,189	28,722	28,965	34,743
	4.5 INSURANCE	17,005	4,953	4,855	6,711
	4.6 VEHICLE EXPENSES	8,153	7,143	9,849	12,043
	4.7 UTILITES	6,919	3,953	2,966	3,935
	4.8 REPAIR AND MAINTAINANCE	834	6,687	1,058	4,287
	4.9 TRAINING	12,631	4,492	2,391	16,261
	4.10 TAXES	4,816	5,619	187,075	19,403
	4.11 SERVICES	49,698	40,356	80,873	139,814
	4.12 DEPRICATION	28,270	30,497	26,467	27,053
	4.13 AMORTIZATION	406	406	406	406
	4.14 PROVISION FOR BAD DEBT	8,292	6,000	6,900	7,015
	4.15 ISM AUDIT	-	639	-	513
	4.16 TRAVEL AND PERDIEM	6,629	6,733	6,376	7,836
	4.17 PROMOTION	18,353.39	25,916	44,217	71,334
	4.17 CURRENCY DIFFERENCE	101,891	120,861	163,299	538,380
	4.18 FINANCIAL CHARGES (Interest + Bank S.)	638,144	621,592	443,189	853,568
	4.20 OTHERS	273	141	198	589
	TOTAL	1,070,272	1,075,160	1,204,220	1,991,682
	GRAND TOTAL	17,037,735	23,271,457	27,123,873	45,767,640

Source: ESLSE (2022)

THE EFFECT OF TECHNOLOGICAL ADVANCEMENT ON LOGISTICS PERFORMANCE THE CASE OF ETHIOPIAN SHIPPING AND LOGISTICS SERVICES ENTERPRISE

by Amanuel Fikru

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