

ADDIS ABABA UNIVERSITY
COLLEGE OF BUSINESS AND ECONOMICS
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DEPARTMENT OF:-
LOGISTICS AND SUPPLY CHAIN MANAGMENT



**THE EFFECT OF LOGISTICS MANAGEMENT ON
ORGANIZATIONAL PERFORMANCE IN CONSTRUCTION
INDUSTRIES:
THE CASE OF ELMI OLINDO CONTRACTORS PLC**

RESEARCH THESIS

**SUBMITTED IN PARTIAL FULFILLMENT FOR THE
REQUIREMENTS OF MASTERS DEGREE IN
LOGISTICS AND SUPPLY CHAIN MANAGEMENT**

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DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN
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construction industries: the case of Elmi olindo contractors PLC**

By

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DECLARATION

I, the undersigned, declare that this research paper is my original work; prepared under the guidance of my Advisor Teklegiorgis Assefa (Asst. professor). All the materials used for the study have been fully acknowledged.

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June, 2020

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Abstract

For many years, reports have continued to show the poor performance of the construction industry with many projects failing to exceed or live up to the expectations of clients.

The purpose of this study is to assess the effects of logistics management on organizational performance in Elmi olindo contractor's plc. To address this study descriptive analysis method was employed and also quantitative and qualitative approaches were used. The total number of employees (53), from logistics department sections and sub-units, supply unit and warehouse administrators, project managers and project storekeepers, and those involved in site coordination activities as they are involved in logistics activities. To gather data, questionnaire has been used. Data obtained through questionnaire has been analysed by using descriptive statics: mean and standard deviation and also inferential statistics (correlation) by SPSS 20.0 software version. The study focused and discovered the effects of logistics management over organizational performance by assessing logistics activities of the company namely; transportation management, customer service management, inventory management, supply management, warehouse management. Lack of well-established standard to check the level of customer satisfaction, not using electronic communication like EDI or RFID, not applying Regular stock reporting and monthly inventory count system to detect material loss, Poor Prevention mechanism from damage due to temperature and humidity have been found to be the major problems of the company that needs due attention Therefore, it has been recommended to the company to take measures to solve and improve logistics activities.

CHAPTER ONE

1. BACKGROUND OF THE STUDY

Managing construction projects requires an integrated process to ensure that they are completed on time, on budget, and within the contract specifications. Labour force productivity enhancement, which typically reduces costs and increases productivity, is one of the major factors in construction project and Logistics management, if performed efficiently, is one the major factors in increasing labor productivity (Agapiou et al.1998)

However, planning for the availability and efficient coordination of materials, tools, and equipment is a difficult task Liu, Georgakis, and Nwagboso 2007; Nevertheless, these resources need to be properly managed to ensure the success of any construction project (Muehlhausen 1991). Moreover, because these elements consume a sizeable portion of the total project budget, inefficient handling will increase costs and decrease productivity (Fei et al.2008). Although it is widely accepted that productivity can be improved by adopting effective logistic management systems, (Liu, Georgakis, and Nwagboso2007). Yet many difficulties in the construction industry can be overcome by following efficient logistics management systems. Tools time, for example, can be improved by implementing an effective materials management system, which eventually increases construction productivity; the project site, too, can be organized in such a way as to reduce congestion (Ruwanpura and Zhang 2008).

Effective logistic management systems will also facilitate the integration and degree of coordination among contractors, sub-contractors, and suppliers and will ultimately increase construction workers 'productivity (Caron, Marchet, and Perego1998). Using the current technologies in developing a logistics management system will help the construction industry. For example, knowing the exact time of delivery and the status of shipments will help contractors prepare for their receipt and will result in reduced preparation time and faster materials delivery on site. Many factors combine to make logistics a complex and dynamic process, especially on a construction site. For example, the construction environment is constantly changing and so many other elements that are related to logistics are changing as well. These elements include the efficiency of construction site gates and storage/work areas. The necessary combination of bulk and

individual components also complicates the management of logistics. Managing logistics, therefore, takes considerable time to plan and supervise because it requires a well-coordinated approach.

One of the most obvious causes of lost productivity is the poor management of materials, equipment, and tools—or “logistics management”. Hence, construction logistics can be defined as “the management of the flow of materials, tools, and equipment (and any related object) from the point of discharge to the point of use or installation (The European Construction 1994). Bringing together and coordinating the management of these three vital components between the project's principal parties would increase productivity substantially. On a construction site, these components must be properly managed to ensure a project's success (Kini 1999; O'Brien1989; Stukhart1995). Ineffective management, on the other hand, will result in conflicts between these aspects. These conflicts will ultimately cause project delays and cost overruns. Because the cost of materials and equipment represents a large proportion of the total project budget, it is vital to manage these costs effectively. Several studies SHOW that these two components consume between 60and 70% of the project's total budget (Kini 1999; Bell & Stukhart1986). Managing the flow of materials, assuring its quality, checking the quantity, allocating the storage areas, coordinating the overall process, triggering the orders, and updating the participants are major obstacles in construction logistics management (Agapiouet al.1998).

Characteristics of construction logistics

Construction work has some distinctive characteristics that influence the logistics management and results in creating the following challenges to logistics management:

1. Each construction site requires a new logistics setup since the location is unique and temporary.
2. Construction sites are material-intensive and are supplied on an irregular basis depending on the construction phase (first concrete, last furniture).
3. Activities should be performed in sequence and if one activity is delayed, all the following activities will also be delayed. Therefore, construction materials should be delivered to

the contractors at a construction site at the right time and in precisely coordinated numbers.

4. Another distinctive character is the fragmented nature of the construction industry. There are many construction companies, suppliers, and logistics service providers working in different temporary construction consortia. This leads to different ways of working and various ways of managing data. Consequently, this results in a high number and inefficient use of vehicles to and from the construction sites thus impacting congestion, emissions, noise, use of public space, traffic safety, and damage to buildings and infrastructure due to the size of the vehicles and the heavy loads. Besides, the lack of planning and coordination among private and public actors in construction projects gives rise to four main problems causing negative effects for various stakeholders: *Janné. M. burden M. r ploos van Amstel W. and Fredriksson A. /June 2018/*

1.1 STATEMENT OF THE PROBLEM

Each construction project demands a multitude of materials and resources that need to be delivered on-time, to the correct location on-site, and according to the rules as set by site management. The scope of construction logistics concerns all supply and disposal shipments of materials, equipment and personnel to and from the construction site, in addition to the efficient and effective planning and control of these resources at the construction site./ *Janné. M. berden M. r ploos van Amstel W. and Fredriksson A. (2018/*

Binti Ksima studied the importance of material management on construction project site and he described that an essential factor adversely affecting the performance of construction projects is the improper handling of materials during site activities. Materials management is made problematic by materials shortages, delays in supply, price fluctuations, damage and wastage, and lack of storage space. besides, paper-based Reports are mostly used to record and exchange information related to the materials component within a supply chain which is problematic, error-prone, and inefficient. Generally, modern technologies are not being adequately used to overcome human error and are not well integrated with project management systems to make the tracking and management of materials easier and faster. Thus, this research focuses on the development of a mechanism to improve materials management on construction projects through the integration of materials tracking and resource modeling systems. The framework was encapsulated in a computer-based prototype system based on

Microsoft Visual Basic NET and it is concluded that the prototype system developed can improve materials management on construction projects, particularly concerning materials tracking and integrating materials utilization. Binti Ksima N. (2008)

Tseng Y. (2005) in his study of the role of transportation in the logistics chain, he concluded that logistics and transportation have some relevance. (1) The Logistics system has a more and more important position in our social activities. (2) Transportation and logistics systems have interdependent relationships that logistics management needs transportation to perform its activities and meanwhile, a successful logistics system could help to improve traffic environment and transportation development. (3) Since transportation contributes to the highest cost among the related elements in logistics systems, the improvement of transport efficiency could change the overall performance of a logistics system. (4) Transportation plays an important role in the logistics system and its activities appear in various sections of logistics processes. Without the linking of transportation, a powerful logistics strategy cannot bring its capacity into full play.

The above scholars and other studies contribute relevant opinions on how to manage logistics. However, the challenges of logistics management spatially on construction industries are growing in its challenge and incurs numerous amounts of costs that could be avoided through the practice of a proper logistics system. Therefore in This study, I try to show the effects of logistics management on organizational performance by taking other scholars' work as a reference and to present the phenomena in Ethiopia context of construction logistics management. Thus, the study will investigate the effects related to managing logistics activates which are customer service, inventory management, warehouse management transportation management and supply management on the organizational performance and also aims to bridge the gap by identifying the main challenges existed in Elmi Olindo constructors plc

Therefore, the main purpose of this research is to identify the Effect of logistics management on organizational performance in construction industries: the case of Elmi Olindo contractors PLC and recommend a workable solution for the effects identified.

1.3 RESEARCH QUESTION

The study also tries to answer the following questions:

- What is the effect of customer service practiced on organizational performance concerning construction logistics activities?
- What are the most critical challenges of logistics facing construction logistics management?
- What are the major effects of inventory management on organizational performance
- What are the effects of warehouse management on organizational performance?
- What is the effect of managing material delivery or transportation on organizational performance?
- What are the effects of supply management practice on organizational performance concerning Material Procurement Coordination Problems?
- How does logistics performance relate to organizational performance?

1.4 OBJECTIVE OF THE STUDY

1.4.1 General Objective

The primary objective of this research is to examine the Effect of logistics management on organizational performance in construction industries, by taking the practice of Elmi Olindo contractors PLC and to consider that the significance of proper logistics management system enables efficient utilization of materials on projects and lower project costs, finally to recommend the necessary process and activities needed to successfully manage the supply chain to accomplish the overall objectives of the company at a most effective level of understanding.

1.4.2 Specific Objectives

The specific objective is to:

- To assess the effect of **customer service** on the organization performance
- Identify the Effect of **transportation management** on the organization performance

- Identify the Effect of **inventory management** on the organization performance
- Assess and analyze the Effect related to **warehouse management** on the organization performance
- Identify the Effect of **supply management** on the organization performance
- Recommend workable solutions based on the analysis which will be presented.

1.5 SIGNIFICANCE OF THE STUDY

The research will have significant inputs for the industry, especially, nowadays Ethiopia is becoming one of the fast-growing countries in Africa, and one of the parameters for a county's development is the level of construction in different infrastructure, so most of the national budget is assigned in the construction industry. And this study will show poor logistic management in the construction industry means a significant loss for the country.

The study also Contribute to the company in a way that shows an efficient and effective logistics management system is important to maximize the capital turn over and minimize losses moreover it Shows that managing logistics collectively with material planning will contribute to the overall profit of the company by reducing project finalizing the time and other costs. The study will add knowledge to the construction company's management on how to manage the logistics management system by offering the theories of logistics management. Therefore, this research will give professionals in the construction area to have a serious thought about what is at stake. And, the research also encourages other researchers to investigate further for improved logistic management system in the industry.

1.6 SCOPE OF THE STUDY

Logistics management encompasses a vast area of managerial practice; however, it is difficult and unmanageable to conduct the study in all area that summarizes Logistics management in terms of time, finance, and research manageability. Therefore, the scope of this study was delimited to a specific context that is the Effect of logistics

management on organizational performance in construction industries: the case of Elmi Olindo contractors PLC

Also, the study has methodological and conceptual scope. Conceptually the scope of this study is to show the practice and challenges of Logistics management directly through their respective defining characteristic variables. And methodologically the scope of the study is Description, not Exploration, Explanation, Prediction, or Evaluation.

1.7. LIMITATION OF THE STUDY

The factor that limits for conducting this study is the lack of recent literature that has been done in Ethiopian construction companies that assess the Effect of logistics management on organizational performance in construction industries.

1.8. ORGANIZATION OF THE STUDY

The research report will be organized into five chapters.

Chapter one is the introductory part which contains the background of the study, statement of the problem, objectives (general & specific objective) of the study, the significance of the study, delimitation, and limitation of the study. Chapter two will focus on the review of related literature. The research design, sample and sampling techniques, types and sources of data, data gathering instruments, the procedures of data collection, and method of data analysis will be included in chapter three, while data analysis presented in chapter four. Finally, findings, conclusions, and recommendations will be in chapter five.

CHAPTER TWO

LITERATURE REVIEW

This chapter collects and reviews relevant preceding literature, which starts with the definition of Logistics Management, followed by the sections covering customer service, transportation, inventory management, warehousing management, supply management, Logistics Management in the construction industry, and the Challenges of logistics management in the construction industry.

2.1 What is Logistics?

Logistics can be defined as the flow of materials, information, and money between consumers and suppliers (Frazelle, 2002). Also, Waters (2003) describes logistics as 'the function responsible for the flow of materials from suppliers into an organization, through operations within an organization, and then out to customers'.

Logistics can also be defined as the process of strategically managing the procurement, movement, and storage of materials, parts and finished inventory through the organization and its marketing channels in such a way that current and future profitability are maximized through the cost-effective fulfillment of orders (Christopher, 2005).

On the other hand, logistics is defined in the Council of Supply Chain Management Professionals' Supply Chain Management Terms and Glossary (2010, 114) as: 'The process of planning, implementing, and controlling procedures for the efficient and effective transportation and storage of goods including services, and related information from the point of origin to the point of consumption to conform to customer requirements.'

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

2.2. Historical perspective

The role of logistics has developed such that it now plays a major part in the success of many different operations and organizations. There have been several distinct stages in the development of distribution and logistics.

The 1950s and early 1960s

In the 1950s and early 1960s, distribution systems were unplanned and unformulated.

The 1960s and early 1970s

In the 1960s and 1970s, the concept of *physical distribution* was developed with the recognition that there was a series of interrelated physical activities such as transport, storage, materials handling and packaging that could be linked together and managed more effectively.

The 1970s

The 1970s was an important decade in the development of the distribution concept. One major change was the recognition by some companies of the need to include distribution in the functional management structure of an organization.

The 1980s

In the 1980s fairly rapid cost increases and the clearer definition of the true costs of distribution contributed to a significant increase in professionalism within a distribution.

The late 1980s and early 1990s

In the late 1980s and early 1990s, advances in information technology-enabled organizations to broaden their perspectives in terms of the functions that could be integrated.

The 1990s

In the 1990s the process of integration was developed even further to encompass not only the key functions within an organization's boundaries but also those functions outside that also contribute to the provision of a product to a final customer. This became known as *supply chain management*

2000 to 2010

Logistics and the supply chain finally became recognized as an area that was key to overall business success. Indeed, for many organizations, changes in logistics have provided the catalyst for major enhancements to their business. The handbook of logistics pp7-9

2.3 Theoretical Literature

In the past, the goals of logistics were connected primarily to cost-effectiveness. Nowadays, besides cost-effectiveness, attention is paid also to fast lead times and developing customer service. As a result of costs, the price is still an important factor in

competition, but also, companies want to shorten delivery times, increase the speed of distribution and reaction, make sure that the delivery arrives on time. Logistics is not just "save money" action; it is an important part of customer-oriented service strategy. (Sakki 2003 p.25: cited by Koykka 2010).

Logistics Management has the mission of getting the right goods or services to the right place, at the right time, and in the desired condition at the lowest cost and highest return on investment but with real satisfaction of customers. Logistics has become a part of a company's strategic planning, management, and controlling. Every company must develop its strategy and logistics competitiveness factors from their point of view Haapanen 2005 p15 (cited by Koykka 2010).

Logistics is the management of goods flows and related information flows. The goal is to guide the flow of materials and information throughout the delivery chain. Logistics is comprised of several different processes, such as procurement, shipping, warehousing, terminals, distribution, and packaging. (Laamanen 2009, p.64) The logistic process includes a lot of communication between people. It could be said that half of the logistics work is administrative work. (Sakki 2003, p.24)

/2.3.1. Logistics activities

2.3.1.1 Customer service

According to Frazelle (2002), the logistics of customer response includes the practices of developing and maintaining a customer service policy, monitoring customer satisfaction, order entry, order processing, and invoicing and collections.

The purpose of the logistic system is to serve customers as well or better than the competition and at the same time to make profits. Customer service is the chain of sales activities and meeting customer requirements, which begins with receiving the orders and ends with the delivery of the products to customers, in some cases continuing with equipment maintenance services (Adriana & Daniela 2010).

The role of customer service is to provide time and place utilities in the transfer of goods and services between the manufacturer and the customer. In another form, the product has no value until it is in the hands of the customer. Availability is a complex concept, influenced by many factors that together form the customer service. These

factors include the frequency of the delivery and its safety, the stock level, and the time interval the order is released (Adriana & Daniela 2010).

2.3.1.2 Transportation Management

The study by [Tseng Y. 2005] on the operation of transportation determines the efficiency of moving products. The progress in techniques and management principles improves the moving load, delivery speed, service quality, operation costs, the usage of facilities, and energy saving. Transportation takes a crucial part in the manipulation of logistics. Reviewing the current condition, a strong system needs a clear frame of logistics and proper transport implements and techniques to link the producing procedures.

Transportation in the logistics system has also a role in service quality. Utilizing well-handled transportation system, goods could be sent to the right place at the right time to satisfy customers' demands. Specified pickup and delivery times, predictable transit time, and zero loss and damage, as well as an accurate and timely exchange of information and invoicing, are services related to transportation management. It all brings efficiency for the company to satisfy customers. Therefore transportation is the base for efficiency and economy in business logistics and expands other functions in the logistics system. Besides, a good transportation system performing in logistics activities brings benefits not only to service quality but also to company competitiveness. Fair and Williams (1981)

Transportation plays a connective role among several steps, it is the planning of all these functions and sub-functions into the system of goods movement to minimize cost, as a result, maximize service to the customers that constitute the concept of business logistics. The system, once put in place, must be effectively managed. (Fair et al. 1981)

2.3.1.3 Inventory Management

According to Meng (2006), inventory is one of the most expensive and important assets of many companies, representing as much as 50% of total invested capital. Managers have long recognized that good inventory control is crucial. On one hand, a firm can try to reduce costs by reducing on-hand inventory levels. On the other hand, customers become dissatisfied when frequent inventory stock out, occur. Thus, companies must make a balance between low and high inventory levels. As you would expect, cost minimization is the major factor in obtaining this delicate balance.

Definition and Purpose of inventory

The study by Meng (2006) shows that Inventory is the stock of any item or resource used in an organization. An inventory system is the set of policies and controls that monitor levels of inventory and determine what levels should be maintained when stock should be replenished, and how large orders should be. All firms (including JIT operations) keep a supply of inventory for the following reasons:

1. To maintain the independence of operations. The supply of materials at a work center allows center flexibility in operation. For example, because there are costs for making each new production setup, this inventory allows management to reduce the number of setups. Independence of workstations is desirable on assembly lines as well. The time that it takes to do identical operations will naturally vary from one unit to the next. Therefore, it is desirable to have a cushion of several parts within the workstation so that shorter performance times can compensate for longer performance times. This way the average output can be fairly stable.

2. To meet the variation in product demand. If the demand for the product is known precisely, it may be possible to produce the product to exactly meet the demand. Usually, however, demand is not completely known, and safety or buffer stock must be maintained to absorb variation.

3. To allow flexibility in production scheduling. A stock of inventory relieves the pressure on the production system to get the goods out. This causes longer lead times, which permit production planning for smoother flow and lower cost Operation through larger lot size production. High setup costs, for example, favor producing a larger number of units once the setup has been made.

4. To provide a safeguard for variation in raw material delivery time. When the material is ordered from a vendor, delays can occur for a variety of reasons: a normal variation in shipping time, a shortage of material at the vendor's plant causing backlogs, an unexpected strike at the vendor's plant or one of the shipping companies, a lost order, or a shipment of the incorrect or defective material.

5. To take advantage of the economic purchase order size. There are costs to place an order: labor, phone calls, typing, postage, and so on. Therefore, the larger each order is the fewer the orders that need be written. Also, shipping costs favor larger orders – the larger the shipment, the lower the per-unit cost. Meng (2006),

As Meng conclusion Inventory plays an important role in a supply chain's ability to support a company's competitive strategy. If a company's competitive strategy requires

a very high level of responsiveness, a company can use the inventory to achieve this responsiveness by locating large amounts of inventory close to the customer. Conversely, a company can also use the inventory to make it more efficient by optimizing inventory through centralized stocking. The trade-off implied in the inventory driver is between the responsiveness that results from more inventories and the efficiency that results from fewer inventories, Meng et al. (2006).

2.3.1.4 Warehousing management,

Rendering Atieh M. /2015/, discussion, an automated warehouse management system is an essential replacement for a manual management system. The main purpose of automating the warehouse system is to control the movement and storage of the products, together with the benefit of enhanced security and quicker handling. The newly created software upgraded the capabilities of the warehouse management system. Currently, the stored data can be organized according to the serial number, activated easily assuring the FIFO concept, and handed to the dealers accurately with the least amount of possible errors. The implementation of a labeling and packaging line inside the warehouse was also an additional function in our study, in which labeling of cards is performed followed by repackaging. All in all, the warehouse system has become more reliable and efficient after the automation, simplifying the process for the operators, the supplier, and the dealers. /Anas M. Atieh et . al 2015 pp5/

2.3.1.5 Supply Management

A unique project delivery system is the cornerstone of the construction industry. The industry is fragmented and distinguished by a collection of large and small firms, related bulk material suppliers, and many other support professionals. The typical supply chain for any given construction project could include architects and engineers, prime contractors, specialty subcontractors, and material suppliers that come together one time to build a single project for a specific owner. Benton W. C and F. McHenry L. (2010)

Supply logistics regards the provision of the material and human resources required for the building production. Among the most important activities are planning and purchasing of procured items, supplier management, transportation of resources on-site, and maintenance of the material resources foreseen in the planning. Wegelius - Lehtonen (2001) present two tools developed to measure the improvement potential of

the deliveries process. The tools measure the costs and time of delivery chains. The first step is to identify all the activities from the supplier's production line to the final assembly of the product on the construction site. The second step is to calculate the costs of each activity and finally to present the results in an informative way. Luiten (2010) mentions that the most important phase for construction logistics is the first phase of the construction process where you have a lot of prefabricated elements and you need just in time deliveries. Van Moolen (2010) indicates that the construction elements that cause the biggest logistical problems are the construction materials that have the biggest volume like steel or concrete, but he also stresses the fact that from a logistic point of view there are many possibilities for improvement in smaller materials handling processes.

Construction project management according to Poppendieck has the task to make sure that the project will be completed on time, within the specified budget, and with the expected quality level achieved. Construction projects require superior planning, managing a fixed scope over a long time, procurement, and human and material resource management. (Poppendieck, 2000).

The disciplines of logistics and project management overlap in such a way that it is not always possible, or even necessary to tell them apart (Poppendieck, 2000). This can be noticed in the definition of construction logistics by Silva and Cardoso, where manpower supply and schedule control, processes always related to project management, are attached to construction logistics processes.

2.3.2 Organizational performance

Organizational performance denotes the effectiveness of the organization in fulfilling its purpose. Some organizations aim to trade successfully and return financial benefits to shareholders, while others have non-financial objectives such as service to the community. Organizational performance encompasses three exact areas of firm outcomes; a financial performance which is concerned with profits, returns on assets, and return on investment; product market performance which centers on sales and market share; and shareholder return that involves total shareholder return and economic value-added. Therefore, organizational performance includes the actual output or results of an organization as measured against its intended outputs which are its goals and objectives (Richard, et al., 2009).

Rendering to (Yamin, et al., 1999) firm performance raises how well a firm achieves its market-oriented goals as well as its financial goals. Financial performance measurements are accounting-based measurements such as ROI, the percentage in market share, the prompt turnover of inventories, return on asset, etc.

Price and quality performance is often the focus of previous, Performance issues in terms of deliveries and lead times are also frequently discussed. In addition, performance in terms of issues concerning the relationship between buyer and supplier – such as communication, relationship atmosphere or obtained flexibility – is commonly considered in previous research. Finally, supplier performance in terms of working conditions is occasionally considered, and notably in relation to garment manufacturing in low-cost countries (Åkesson, et al., 2007).

2.4 Empirical Literature

2.4.1 Logistics Management in the construction industry

Serra and Oliveira (2003) in their study of *Development of the Logistics Plans in Building Construction* stated that a multidisciplinary process applied to a given construction to ensure the supply, storage, processing and availability of material resources on the construction site, to dimension the production teams and to manage the physical flows of production". Silva and Cardoso (1998) state that the main support of this process, which occurs through planning, organization, management, and control activities, is the flow of information before and during the production process. A company, being a member of a larger supply chain of suppliers and customers, has its system of internal logistics also in the form of supply chains. Construction logistics may be considered in several aspects (Serra & Oliveira, 2003):

Vrijhoef and Koskela (2005), on their study, called A Critical Review of Construction as a Project-based Industry stated that; the construction industry has traditionally been dominated by project-based one-off production. Often the traditional approach to construction, particularly the one-off approach to projects and the fragmented structure of the industry has been criticized for not being efficient. For most kinds of projects and sectors of construction though, the project-based approach is logical and sometimes inevitable, particularly for large civil projects. However, for smaller kinds of projects, in certain sectors, and by developing an alternative strategic approach to procurement or delivery it is possible to achieve project independent construction to different extents

and in different forms. Both clients and supply chain parties may choose to follow the path of project independent construction. This requires certain strategic decisions and playing another role in the supply chain, and higher levels of supply chain integration, through internalization of more activities or strategic collaboration with other supply chain parties.

2.4.2 Challenges of logistics management in the construction industry

According to Assaf s. study on the Causes of delay in large construction projects, in construction, a delay could be defined as the time overrun either beyond completion date specified in a contract or beyond the date that the parties agreed upon for delivery of a project. It is a project slipping over its planned schedule and is considered a common problem in construction projects. To the owner, a delay means loss of revenue through a lack of production facilities and rent-able space or dependence on present facilities. In some cases, to the contractor, a delay means higher overhead costs because of the longer work period, higher material costs through inflation, and due to labor cost increases. Completing projects on time is an indicator of efficiency, but the construction process is subject to many variables and unpredictable factors, which result from many sources. These sources include the performance of parties, resource availability, environmental conditions, the involvement of other parties, and contractual relations. However, it rarely happens that a project is completed within the specified time. (Assaf s., 2006)

Inadequate tracking facilities on site: There is a lack of adequate and real-time tracking and monitoring facilities for materials and equipment on-site (Jang and Skibniewski, 2008). At the site level, research has shown that very few major contractors have any systems, either paper or computer-based, for tracking and controlling materials. Hence, they have almost no data that give any information on the quantities, values, or location of materials on-site, or anywhere else in the supply chain (Hill and Ballard, 2001). Inadequate tracking facilities can also affect the quality of construction because material such as ready-mixed concrete requires timely delivery and placing in the Construction area. Therefore, concrete mixer trucks require real-time positioning and tracking. One key objective of that will be to automatically record important events of the truck to derive operations data such as travel times along designated travel routes, on-site queuing times, and unloading times. Such data will provide valuable input for keeping

quality control, analysis of logistical efficiency of ready-mixed concrete deliveries and simulation modeling of concrete production-delivery-placing operations for productivity improvement (Lu *et al.*, 2007)

Wegelius-Lehtonen, on his study of Performance measurement in construction logistics, describes a challenge that there is a lack of proper performance measurement for construction logistics e.g. delivery performance, stock availability, timeliness of waste removal, quality and site storage quantity. Because of competitive bidding in the construction industry, the lowest bidder gets the contract and the project is rejected or accepted based only on conformance to technical specification. Other performance measures that relate to the process itself are then neglected. Therefore, the construction industry has to find new process-oriented approaches to improve its operations. (Wegelius-Lehtonen, 2001).

Materials Loss: A large quantity of construction materials is lost to damage and/or theft as a result of improper storage, poor handling, wrong transportation carrier choice, and excess materials and components that could have been optimized right from the design stage. The UK construction industry generates a staggering over 70 million tonnes of waste every year (Kwan, 2001)

Delay in construction project delivery: A lot of quality time will be wasted when materials run out of stock because construction activities may have to stop while waiting for the next delivery of materials. One of the causes of construction delay is delivery lateness (Al-Momani, 2000; Assaf and Al-Hejji, 2006 and Bates *et al.*, 1999). Also, the manual process of assessing materials at the point of delivery on the construction site is time-consuming (Sullivan *et al.*, 2010).

Inaccurate data: One of the prevailing problems of materials storage is the inaccuracy of information regarding inventory, storage location, and generation of inaccurate reports (Jang and Skibniewski, 2008; Poon *et al.*, 2009).

The excessive cost of construction: Poor logistics makes the cost of construction to be excessively high because the excess supply of materials, theft, and materials damage are non-value-added costs (Navon and Berkovich, 2005).

Poor image of the construction industry: Poor logistics can result in a large amount of waste being removed from the site and a lot of construction vehicles move about empty

or half-empty. These contribute to environmental pollution and degradation. Also, materials delivery vehicles parked in inappropriate places outside the construction site do not give a good impression of the construction industry (Strategic Forum, 2005).

Fragmentation of activities within the construction process: The various teams, such as the design team and construction team, involved in the construction process is fragmented. This may cause suppliers not to fully understand the implications of design, materials, and components choices making them, sometimes, to supply wrong materials and/or wrong quantities of material to the site. The primary focus of logistics functions in construction is to improve coordination and communication among project participants during the design and construction phases (Shakantu *et al.*, 2008).

Short-Term nature of the construction process: Construction work is seen as a one-off job in which teams are built for a short period. This makes it difficult to build an optimized logistics system in a way that is possible in the manufacturing and retail industries. Each project is regarded as unique; every project is a prototype and because each site is different, hence the design is different (Wegelius-Lehtonen, 2001).

(Dey, 2000) stated that Delays in materials supply are a major cause of time overrun. Many factors accelerate the delay of project duration, however poor materials management can have a major effect on on-site activities. Ogunlana et A (1996) suggested that the main reasons for project delays on housing projects in Thailand were incomplete drawings, material management problems, organization deficiencies, shortage of construction materials, and inefficiencies in site workers. Dey (2000) also suggested that delays in materials supply were a major cause of time overrun. Thus, it would seem that materials delays are a major cause of delays in construction projects. There is also a need for an integrated material handling process from the design stage to the usage of materials-This could happen, with a good management system with the implementation of ICT in managing materials. Hence, a good materials management environment enables proper materials handling on Construction sites.

(Canter, 1993) discussed that Material storage on-site requires close attention to avoid waste, loss, and any damage of materials that would affect the operations on the construction project. Problems often arise during materials supply because of improper storage and protection facilities. Previous studies have identified that building materials

often require a large storage capacity which is rarely available on site (Agapiou et al, 1998). However, Stukhart (1995) suggested that there are a few considerations to be taken into account in the planning of the storage space such as the timing of the initial buy, and historical information and experience. Materials management on-site should seek to reduce the loss of profit due to theft, damage, and wastage, as well as running out of stock. Therefore, the requirements of storing space should be taken into consideration from the initial stage of the construction process.

(Al-Momani A. 2000) In his study indicates that the main causes of delay in the construction of public projects relate to designers, user changes, weather, site conditions, late deliveries, economic conditions, and an increase in quantity. The presences of these factors have an impact on the successful completion of the projects at the time contractually specified. The findings suggest that special attention to factors identified in this study will help industry practitioners in minimizing the risk of contract disputes.

2.5 General Characteristics of Construction Logistics

Construction logistics have different characteristics comparing to logistics in other industries. According to Vrijhoef and Koskela (2005), the construction supply chain has three elements different from ordinary supply chains which include:

☒ ***Converging supply chain:*** The flow of the materials is towards the construction site where they are assembled into a new building or infrastructure project. The construction site can be characterized as a temporary construction factory that is only producing a single product and except waste, no products are further distributed.

☒ ***Temporary supply chain:*** Commonly, the construction site is set-up to build just one object. Nevertheless, each construction site can be viewed as a set of processes and organizations that are reorganized and adjusted to a specific project and although the projects might differ to a great extent, the processes are not.

☒ ***Make-to-Order supply chain:*** Due to the unique nature of each project, highly specialized parts and materials are needed so as a result repetition only occasionally occurs. Due to this fact, delays may occur because of items that will have to be re-ordered due to damage or production errors, as factories usually have limited stock levels for the highly specialized parts or materials.

Another difference regards the proportion of the logistic cost in the total construction project costs. Several attempts in the past have been carried out to structure the costs of a construction project. Logistiek.nl states that the logistics costs as a share of total project costs have increased during the last years from 8% to 15% although sometimes logistics costs can even be considered 20% of the total project costs (EVO, 2007). Even though there are differences in the precise estimation of the logistics costs, it is clear that construction logistics costs have a larger share than logistics in other industries. Some reasons for this, mentioned by Lange (2009), include:

- Lack of return freight
- Need for specialized equipment
- A large share of raw materials with high volume/weight ratio
- Less consolidation

Supply chain management can be a measure to control the logistics costs, although supply chain management traditionally plays a limited role in the construction industry due to the relatively low product value and the involvement of many and changing parties (Lange, 2009).

Resulting from the analysis of the concept of construction logistics, it might be expected that substantial attention would be paid to logistics when developing a construction strategy. However, in reality, construction-specific logistics is an area that has not been addressed properly by the construction industry so far. Seminal reports on the UK construction industry (Latham, 1994; Egan, 1998; Bourn, 2001; SFC, 2002) highlighted the inefficiencies and waste of the industry due to poor logistical performance.

The *“Improving Construction Logistics”* report published by the Strategic Forum for Construction Logistics Group (2005) argues that the application of proper logistics in the construction industry has been slower than other industries and that there is a lot of opportunity for change towards this direction.

2.6 Conceptual framework

Independent variables

Dependent variable

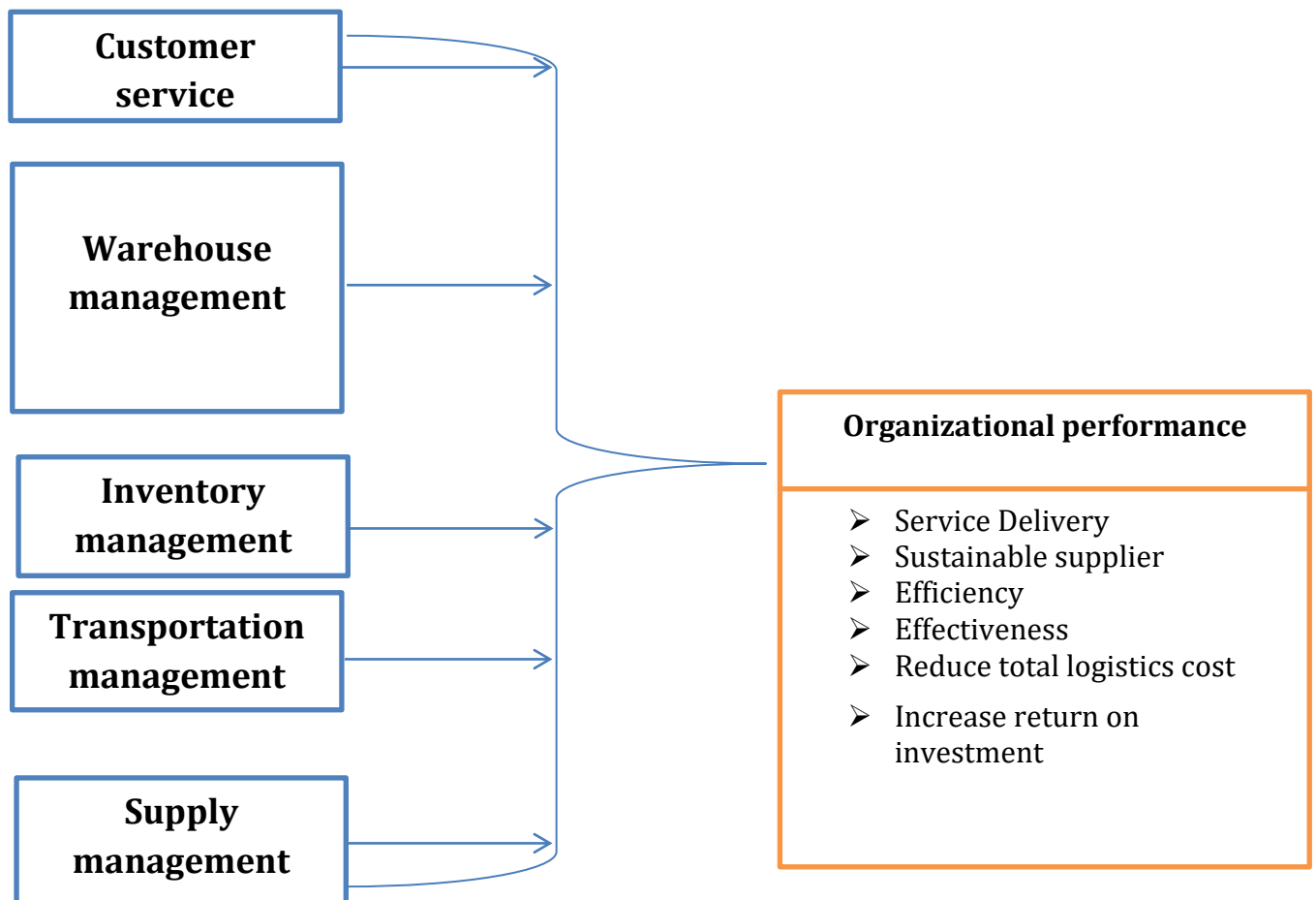


Fig 1: Conceptual framework of the study: adapted from Moses Toroitich Kirui 2017 *Economic Strategic Journal of Business & Change Management*

As indicated in the diagram of the conceptual framework, the study is highly focused on the extent of construction logistics practices of the above five main logistics activities and the desired outcome of their coordination, as the diagram showed the ability in coordinating those activities, will result on achieving a sound organizational performance

CHAPTER THREE

METHODOLOGY

In this chapter, the researcher described various methods and approaches explained by different authors. After giving a theoretical demonstration of each part of the methodology, the researcher explained why and how these approaches arranged to conduct the research.

3.1. AREA OF STUDY

This study is focused on ELMI OLINDO CONTRUCTERS PLC and evaluates the Effect of logistics management on organizational performance. The company under study has more than 300 permanent employees. The main reason to study the Effect of logistics management on organizational performance in Elmi Olindo contractors PLC is that the company involves in different types of construction activities like building a residence, commercial buildings, beverage factories and malt factories which has a diversifying material sourcing and sophisticated logistics activates and challenges; that would be a potential source to identify the Effect of logistics management on organizational performance and the company is one of the oldest and pioneer of construction in Ethiopia since 1937. Therefore, the more the company has a vast experience in construction, the more the research would be valid.

The other reason of this study on the Effect of logistics management on organizational performance in the company is that the core activities of the company depend on logistics activities because their main activities are on transportation, import and distribution/site delivery/ of materials throughout the country, because of these reasons I have selected the company for my study.

3.2. RESEARCH DESIGN AND APPROACH

The research has deployed a descriptive survey method, which describes the Effect of logistics management on organizational performance of ELMI OLINDO CONTRUCTERS PLC. The approach was more structured and controlled. According to Emory (1995), a survey is feasible when the population is small and variable hence the researcher was able to cover all the elements of the population. For this study, questionnaires will be used to gather data.

3.3. POPULATION AND SAMPLE

The target population of the study in this research is employees of logistics department sections and sub-units, supply unit and warehouse administrators, project managers and project storekeepers, and those involved in site coordination activities as they are involved in logistics activities. From these departments and sections, the total numbers of employees are 53. As the study covers all the employees in the stated department and census were used to conduct the research.

3.4. DATA SOURCE AND TYPE

The researcher used primary sources of data. The primary sources of data are obtained from respondents through questionnaires.

3.5. DATA COLLECTION PROCEDURES OR INSTRUMENTS

The main data collection instrument of this study is a structured questionnaire.

3.6 ETHICAL CONSIDERATION

All the information and documents including the questionnaire filled by the respondent will be used ethically without falsifying the original meaning of the respondent and also kept confidential. To assure the confidentiality of the respondents the researcher will let respondents do not disclose their name in the questionnaire. Besides, all the documents and information gathered through the process of this research will be used for the intended purpose only and by no means will be manipulated in other ways without getting the consent of the respondents.

3.7. DATA ANALYSIS

The method of data analysis will be based on the type of instrument employed to gather information. Data obtained from questionnaires analyses the first raw data were tallied and tabulated. To analyze the majority of data obtained through a questionnaire, descriptive statistics (mean and standard deviations) supported by SPSS software version 25.0 will be applied. Depending on the results of the analysis, interpretations and necessary discussions will be made to clarify the issue. Finally, the major findings and recommendations will be provided.

3.8 RELIABILITY AND VALIDITY

Validity is the extent to which the device measures what it is supposed to measure, whereas reliability is the consistency between successive measurements of the same

subject under the same conditions. *W. Soames R., palastanga N. Tibbitts R. (2018)* in this study, the researcher has chosen to use questionnaire. This data collection instruments will be the major part of the measurement procedure. The deliverables from this measurement should bring an accurate representation of the study to be considered valid. In this regard, the researcher carries out a pilot survey on the content of the questionnaire to make sure all types of questions could be able to generate a reasonable response to consider and conduct a valid study.

Chapter four

4.1 Introduction

The study endeavoured to examine the Effects of logistics management on organizational performance in construction industries; the case of Elmi Olindo co. PLC. Therefore, the findings of the study are presented and discussed in this chapter. The questionnaire was developed in five scales ranging from one to five; where 5 represents Strongly agree, 4 agree, 3 Neutral, 2 disagree, and 1 strongly disagrees. To assess the relationship between logistics management & organizational performance, Correlation analyses were conducted for scale typed questionnaire. A total of 53 questionnaires were distributed to employees and 46 (86.7%) questionnaires were obtained valid and used for analysis. The collected data were presented and analyzed using SPSS (version 25) statistical software. The research used correlation analysis, specifically the Pearson Correlation correlation to measure the degree of association between different variables under consideration.

4.2 Response Rate

A total of 53 questionnaires were distributed to employees and 46 (86.7%) questionnaires were obtained. The remaining 7 questionnaires were not collected due to different reasons for the employees. Based on these, the response rate is 86.7%.

4.3 Demography of Respondents

Gender				
		Frequency	Percent	Cumulative Percent
Valid	Male	38	82.6	82.6
	Female	8	17.4	100.0
	Total	46	100.0	
Age				
		Frequency	Percent	Cumulative Percent
Valid	Less than 25	1	2.2	2.2
	26- 30	5	10.9	13.0
	31- 35	12	26.1	39.1
	36 - 40	16	34.8	73.9
	41 and above	12	26.1	100.0
	Total	46	100.0	
Level of education				
		Frequency	Percent	Cumulative Percent
Valid	Diploma	10	21.7	21.7
	Degree	34	73.9	95.7
	MA	1	2.2	97.8
	PhD	1	2.2	100.0
	Total	46	100.0	
Year of service you have worked in the current organization				
		Frequency	Percent	Cumulative Percent
Valid	1 – 4 year's	3	6.5	6.5
	5 – 9 years	16	34.8	41.3
	10 – 20 years	18	39.1	80.4
	Above 20 years	9	19.6	100.0
	Total	46	100.0	

Table 4.1

Source: (SPSS Output, 2020)

The analysis of the respondents' profile in terms of their Gender, Age, Level of education Work Experience, and Marital Status in line with Table 4.1 is presented as follows.

Gender:

The total number of participants who took part in the survey is 46 out of which 38 consists of males (82.6%) and 8 consists of females (17.4 %). The gender distribution is shown in table 4.1.

Age:

The total number of respondents is 46. This table shows that there are 1(2.2%) respondents in the age group Less than 25, 5(10.9%) respondents in the age group 26-30, 12(26.1%) respondents in the age group 31- 35 and 16(34.8%) respondents in the age group 36 - 40 12(26.1%) respondents in the age group above 41. The age distribution is shown in Table 4.1.

Level of education:

The total number of respondents is 46. This table shows that there are 10 (21.7%) have a Diploma, 34 respondents (73.9%) have 1st degrees (BA/BSc Degree), 1(2.2 %) have 2nd Degree (MSc/MA Degree) holders. 1(2.2 %) have Ph.D. degree holders.

Work Experience:

The total number of respondents is 46. This table shows that there are 3(6.5%) fall at a work experience of 1 – 4 year's, 16 respondents (34.8 %) fall at a work experience level of 5-9 years, 18 respondents (39.1%) are with 10-20 years' experience and the rest 9 respondents (19.6 %) are at a work experience of more than 20 years. From this, it can be concluded that the majority of respondents, which are 43 respondents (94.5%) fall at work experience above five years. This implies that most of the respondents have enough experience in their firm and the objective of the study.

4.4 The Customer Service Management Practice

logistics service responds quickly to construction site needs				
		Frequency	Percent	Cumulative Percent
Valid	Disagree	2	4.3	4.3
	Neither	16	34.8	39.1
	Agree	22	47.8	87.0
	Strongly Agree	6	13.0	100.0
	Total	46	100.0	
fulfilling sites orders in the promised date				
		Frequency	Percent	Cumulative Percent
Valid	Disagree	9	19.6	19.6
	Neither	24	52.2	71.7
	Agree	13	28.3	100.0
	Total	46	100.0	
apply up to date information for forecasting of construction sites 'needs				
		Frequency	Percent	Cumulative Percent
Valid	Disagree	10	21.7	21.7
	Neither	15	32.6	54.3
	Agree	19	41.3	95.7
	Strongly Agree	2	4.3	100.0
	Total	46	100.0	
Applying electronic communication like EDI or ERP with suppliers for joint planning				
		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	15	32.6	32.6
	Disagree	13	28.3	60.9
	Neither	15	32.6	93.5
	Agree	1	2.2	95.7
	Strongly Agree	2	4.3	100.0
	Total	46	100.0	
sharing technical information with sites and suppliers when required				
		Frequency	Percent	Cumulative Percent
valid	Disagree	2	4.3	4.3
	Neither	18	39.1	43.5
	Agree	19	41.3	84.8

	Strongly Agree	7	15.2	100.0
	Total	46	100.0	
creating long-term relationships with suppliers				
		Frequency	Percent	Cumulative Percent
Valid	Neither	9	19.6	19.6
	Agree	27	58.7	78.3
	Strongly Agree	10	21.7	100.0
	Total	46	100.0	

Table 4.2

Source: (SPSS Output, 2020)

In the first question, respondents inquired about the company logistics service responds quickly to construction site needs. 2(4.3%) disagree with this question. 16 (34.8%) of the respondents neither agree nor disagree with the question. 22 (47.8 %) agree with this question. The least respondents of the question belong to strongly agree 8 (13.0%). This indicates that the majority of the respondents show their agreement that the logistics service responds quickly to construction site needs.

In question 2, at this time respondents were asked about the company's customer service fulfill site orders on the promised date. The majority of the respondents neither agree nor disagree with a level of agreement of 24(52.2%) followed by 13(28.3%) agree. 9(19.6%) of the respondents disagree with questions. In this analysis, the majority of the respondents say neither agree nor disagree and this shows that sometimes the company's customer service fulfills site orders in the promised date and sometimes not.

In question 3, respondents asked about that the company customer service applies up to date information for forecasting of construction sites 'needs. The majority of the respondents 19(41.3%) agree and 15(32.6%) of them are neither agree nor disagree agree. 10(21.7%) of the respondents disagree with the question, 2(4.3%) of the respondent strongly agree with the question, The analysis shows most of them agrees that the customer service applies up to date information for forecasting of construction sites 'needs.

In question 4, respondents were asked about applying electronic communication with suppliers for joint planning. The majority of the respondents 15(32.6%) strongly disagree and neither disagree nor agree with equal numbers of

respondents. 13(28.3%) of the respondents react as disagree. 1(2.2%) and 2(4.3%) of the respondents agree and strongly agree respectively. This indicates that the majority of the respondents disagree on the existence of electronic communication with suppliers for joint planning.

In question 5, respondents were asked about the employees in customer service share technical information with sites and suppliers when required s. The majority of the respondents 19(41.3%) agree with the question and 18(39.1) of the respondents react as Neither agrees nor disagree with the question. 7(15.2%) of the respondents disagree with the question and 2(4.3%) of the respondents strongly agree with the question. This indicates that the majority of the respondents agree on the customer service practice of sharing technical information with sites and suppliers when required

In question 6, respondents were asked about the employees in customer service creates long-term relationships with suppliers. The majority of the respondents 37(80.4%) agree and strongly agree with the question and 9(19.6%) of the respondents react as neither. This indicates that the majority of the respondents agree on employees' on creating long-term relationships with suppliers.

4.5 Inventory Planning Practice

There are accurate identification of all materials in the stock /availing nice inventory information				
		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	4	8.7	8.7
	Disagree	17	37.0	45.7
	Neither	21	45.7	91.3
	Agree	4	8.7	100.0
	Total	46	100.0	
centralized inventory management system deployed throughout the company				
		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	5	10.9	10.9
	Disagree	13	28.3	39.1
	Neither	26	56.5	95.7
	Agree	2	4.3	100.0

Total		46	100.0	
there is on-time inventory Replenishment practice throughout the company				
		Frequency	Percent	Cumulative Percent
Valid	Disagree	8	17.4	17.4
	Neither	18	39.1	56.5
	Agree	14	30.4	87.0
	Strongly Agree	6	13.0	100.0
	Total	46	100.0	
Creating a collaborative arrangement with sites and suppliers for inventory management				
		Frequency	Percent	Cumulative Percent
Valid	Disagree	13	28.3	28.3
	Neither	30	65.2	93.5
	Agree	3	6.5	100.0
	Total	46	100.0	
Have a system for wastage free utilization of available materials inventory				
		Frequency	Percent	Cumulative Percent
Valid	Disagree	12	26.1	26.1
	Neither	29	63.0	89.1
	Agree	5	10.9	100.0
	Total	46	100.0	

Table 4.3

Source: (SPSS Output, 2020)

In the first question, respondents asked about whether there is an accurate identification of all materials in the stock /availing nice inventory information. Of the total respondents, 21(45.7%) neither agree nor disagree with this question. 17(30.0%) disagree with the question and 4(8.7%) of the respondents strongly disagree with the point and 4(8.7%) of the respondents strongly agree with the point

In the 2 questions, where respondents were asked about whether there is a centralized inventory management system deployed throughout the company. Then the majority of the respondents neither and disagree with 39(84.8%) and followed with 5 (10.9%) of the respondents strongly disagree with the question and the remaining 2(4.3%) of the respondents are agreed on the question.

In question 3, respondents asked about whether there is on-time inventory Replenishment practice throughout the company. The majority of the respondents 18(39.1%) are neither

agree nor disagree with question 14(30.4%) are agree with the question. 8(17.4%) are disagree with question 6(13.0%) are strongly agree with the question.

In question 4, respondents were asked about creating a collaborative arrangement with sites and suppliers for inventory management. The majority of the respondents 30(65.2%) neither agree nor disagree with the question, 13(28.3%) of the respondents disagree with the question. 3(6.5%) of the respondents agree with the question.

In question 5, respondents were asked about having a system for wastage free utilization of available materials inventory. The majority of the respondents 29(63.0%) neither agree nor disagree with the question, 12(26.1%) of the respondents disagree with the question and the remaining 5(10.9%) of the respondents agree with the question.

4.6 The Warehouse Management Practice

Regular stock reporting and monthly inventory count system to detect material loss.				
		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	4	8.7	8.7
	Disagree	19	41.3	50.0
	Neither	20	43.5	93.5
	Agree	3	6.5	100.0
	Total	46	100.0	
Scrap material disposal in a way that benefits the company				
		Frequency	Percent	Cumulative Percent
Valid	Disagree	5	10.9	10.9
	Neither	22	47.8	58.7
	Agree	14	30.4	89.1
	Strongly Agree	5	10.9	100.0
	Total	46	100.0	
Using specialized material handling equipment				
		Frequency	Percent	Cumulative Percent
Valid	Disagree	12	26.1	26.1
	Neither	30	65.2	91.3
	Agree	4	8.7	100.0
	Total	46	100.0	
Apply Prevention mechanisms from damage due to temperature and humidity such as cement hardening.				
		Frequency	Percent	Cumulative Percent

Valid	Disagree	15	32.6	32.6
	Neither	28	60.9	93.5
	Agree	3	6.5	100.0
	Total	46	100.0	
Uses of Systems that recognize identities of operatives enabling site warehouse managers to issue warnings to individuals of collision accident in prone zones.				
		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	8	17.4	17.4
	Disagree	13	28.3	45.7
	Neither	21	45.7	91.3
	Agree	4	8.7	100.0
	Total	46	100.0	

Table 4.4

Source: (SPSS Output, 2020)

In the first question, respondents asked about regular stock reporting and monthly inventory count system to detect material loss. The majority of the respondents 20 (43.5%) neither agree nor disagree with the question, followed by this 19 (41.3%) of the respondents disagree with this question 4 (8.7%) of the respondents strongly disagree and 3 (6.5%) of the respondents agree.

In question 2, where respondents were asked about Scrap material disposal in a way that benefits the company. The majority of the respondents 22 (47.8%) are neither agree nor disagree with the question, 14 (30.4%) agree, 5(10.9%) disagree with the question and the rest 5(10.9%) strongly agree with the question.

In question 3, where respondents were asked about Using of specialized material handling equipment. The majority of the respondents 30 (65.2) neither agree nor disagree with the question, 12(26.1%) disagrees and the remaining 4(8.7%) agree with the question.

In question 4, where respondents were asked about Applying Prevention mechanisms from damage due to temperature and humidity such as cement hardening. The majority of the respondents 28(60.9%) neither agree nor disagree with the question, 15(32.6%) disagree and the remaining 3(6.5%) agree with the question.

In question 5, where respondents were asked about Uses of Systems that recognize identities of operatives enabling site warehouse managers to issue warnings to individuals of collision accident in prone zones. The majority of the respondents 21(45.7%) neither agree nor disagree with the question, 8(17.4%) strongly disagree and the remaining 4(8.7%) are with the question.

4.7 Transportation Management Practice

Ability to track the location of delivery vehicles en-route construction site.				
		Frequency	Percent	Cumulative Percent
Valid	Disagree	4	8.7	8.7
	Neither	12	26.1	34.8
	Agree	22	47.8	82.6
	Strongly Agree	8	17.4	100.0
	Total	46	100.0	
Planning of alternative routes for delivery vehicles en-route to a construction site				
		Frequency	Percent	Cumulative Percent
Valid	Disagree	6	13.0	13.0
	Neither	15	32.6	45.7
	Agree	20	43.5	89.1
	Strongly Agree	5	10.9	100.0
	Total	46	100.0	
Instant identification of multiple materials delivered on-site which improves delivery vehicle turn around.				
		Frequency	Percent	Cumulative Percent
Valid	Disagree	6	13.0	13.0
	Neither	9	19.6	32.6
	Agree	26	56.5	89.1
	Strongly Agree	5	10.9	100.0
	Total	46	100.0	
The transportation system of the company like timely delivery of materials satisfy site requirement				
		Frequency	Percent	Cumulative Percent
Valid	Disagree	1	2.2	2.2
	Neither	12	26.1	28.3
	Agree	19	41.3	69.6
	Strongly Agree	14	30.4	100.0
	Total	46	100.0	
Transportation and distribution by using other transportation company reduce the cost of logistics				
		Frequency	Percent	Cumulative Percent

Valid	Disagree	4	8.7	8.7
	Neither	13	28.3	37.0
	Agree	18	39.1	76.1
	Strongly Agree	11	23.9	100.0
	Total	46	100.0	
The company applies economies of scale and economies of distance to minimize transportation cost per unit				
		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	1	2.2	2.2
	Disagree	2	4.3	6.5
	Neither	15	32.6	39.1
	Agree	19	41.3	80.4
	Strongly Agree	9	19.6	100.0
	Total	46	100.0	

Table 4.5

Source: (SPSS Output, 2020)

On question 1, respondents were asked about the **ability to track the location of delivery vehicles en-route construction site**. Out of 46 respondents 22(47.8%) of the respondents agree with the question, and 12(26.1%) neither agree nor disagree with the question, 8(17.4%) of the respondents strongly agree with the question and 6(8.7%) disagree with the question. In this analysis, more than 65.2% of the respondents show their agreement. This leads to the current practice or system of transportation provides efficiency in logistics.

On question 2, respondents were asked about the Planning of alternative routes for delivery vehicles en-route to the construction site. Out of 46 respondents 20(43.5%) of the respondents agree with the question, and 15(32.6%) neither agree nor disagree with the question, 5(10.9%) of the respondents strongly agree with the question and 6(13.0%) disagree with the question. In this analysis, more than 54.4% of the respondents show their agreement. This leads to the current practice or system of transportation provides efficiency in logistics

On question 3, respondents were asked about the Instant identification of multiple materials delivered on-site which improves delivery vehicle turn around. Out of 46 respondents 26(56.5%) of the respondents agree with the question, and 9(19.6%) neither agree nor disagree with the question, 5(10.9%) of the respondents strongly agree with the question and 6(13%) disagree with the question. In this analysis, more than 67.4% of the respondents show their agreement. This leads to the current practice or system of transportation provides effective information sharing between construction sites and increase the efficiency of logistics.

On question 4, respondents were asked about the transportation system of the company like the timely delivery of materials to satisfy site requirements. Out of 46 respondents 19(47.8%) of the respondents agree with the question, and 12(26.1%) neither agree nor disagree with the question, 14(30.4%) of the respondents strongly agree with the question and 1(2.2%) disagree with the question. In this analysis, more than 71.7% of the respondents show their agreement. This leads to the current practice or system of transportation support timely delivery of materials satisfy site requirement

On question 5, respondents were asked about the Transportation and distribution of using other transportation company reduces the cost of logistics. Out of 46 respondents 18(39.1%) of the respondents agree with the question, and 13(28.3%) neither agree nor disagree with the question, 11(23.9%) of the respondents strongly agree with the question and 4(8.7%) disagree with the question. In this analysis, more than 63% of the respondents show their agreement. This leads to the conclusion that using other transportation company reduces the cost of logistics

On question 6, respondents were asked about the company applies economies of scale and economies of distance to minimize transportation cost per unit. Out of 46 respondents 19(41.3%) of the respondents agree with the question, and 15(32.6%) neither agree nor disagree with the question, 9(19.6%) of the respondents strongly agree with the question and 1(2.2%) disagree with the question. In this analysis, more than 60.9% of the respondents show their agreement. This leads to the current practice or system of transportation provides efficiency in logistics.

4.8 supply Management Practice

The procured goods will be delivered promptly

		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	2	4.3	4.3
	Disagree	10	21.7	26.1
	Neither	13	28.3	54.3
	Agree	20	43.5	97.8
	Strongly Agree	1	2.2	100.0
Total		46	100.0	
The procured goods are received with maximum quantity tolerance of the company				
		Frequency	Percent	Cumulative Percent
Valid	Disagree	2	4.3	4.3
	Neither	23	50.0	54.3
	Agree	16	34.8	89.1
	Strongly Agree	5	10.9	100.0
	Total		46	100.0
The requesting Sites order materials without appropriate priority				
		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	4	8.7	8.7
	Disagree	4	8.7	17.4
	Neither	16	34.8	52.2
	Agree	22	47.8	100.0
	Total		46	100.0
The supply management system designed in the company target to minimize acquisition cost and logistics cost				
		Frequency	Percent	Cumulative Percent
Valid	Disagree	1	2.2	2.2
	Neither	17	37.0	39.1
	Agree	19	41.3	80.4
	Strongly Agree	9	19.6	100.0
	Total		46	100.0
The organization approach to the supplier has an impact on the success of supply				
		Frequency	Percent	Cumulative Percent
Valid	Neither	21	45.7	45.7
	Agree	21	45.7	91.3
	Strongly Agree	4	8.7	100.0
	Total		46	100.0

Table 4.6

Source: (SPSS Output, 2020)

On question 1, respondents were asked about the procured goods that will be delivered promptly. Out of 46 respondents, 20(43.5%) of the respondents agree with the question,

13(28.3%) neither agree nor disagree with the question, 1(2.2%) of the respondents strongly agree with the question, 10(21.7%) disagree with the question and 2(4.3%) strongly disagree with the question.

On question 2, respondents were asked about the procured goods are received with maximum quantity tolerance of the company. Out of 46 respondents, 16(34.8%) of the respondents agree with the question, 23(50%) neither agree nor disagree with the question, 5(10.9%) of the respondents strongly agree with the question, 2(4.3%) disagree with the question.

On question 3, respondents were asked about the requesting Sites order materials without appropriate priority. Out of 46 respondents, 22(47.8%) of the respondents agree with the question, 16(34.8%) neither agree nor disagree with the question, 4(8.7%) of the respondents strongly disagree with the question, 4(8.7%) disagree with the question

On question 4, respondents were asked about the supply management system designed in the company target to minimize acquisition cost and logistics cost. Out of 46 respondents, 19(41.3%) of the respondents agree with the question, 17(37%) neither agree nor disagree with the question, 9(2.2%) of the respondents strongly agree with the question, 1(2.2%) disagree with the question.

On question 5, respondents were asked about the organization approach to the supplier has an impact on the success of supply. Out of 46 respondents, 21(45.7%) of the respondents agree with the question, 21(45.7%) neither agree nor disagree with the question, 4(8.7%) of the respondents strongly agree with the question,

The majority of the respondents say agree followed by neither agree nor disagree on the practice of procured goods will be delivered on time; procured goods are received with maximum quantity tolerance of the company; the requesting Sites order materials without appropriate priority; supply management system designed in the company target to minimize acquisition cost and logistics cost; the organization approach to the supplier has an impact on the success of supply. Except for the question asked about material ordered without a sequence or priority which is one of the characteristics of

construction work the other response have a positive impact on the organization performance

4.9 Organizational performance

The company Creates high Customer satisfaction				
		Frequency	Percent	Cumulative Percent
Valid	Disagree	9	19.6	19.6
	Neither	10	21.7	41.3
	Agree	15	32.6	73.9
	Strongly Agree	12	26.1	100.0
	Total	46	100.0	
	The company Have Adequate inventory to run all projects			
		Frequency	Percent	Cumulative Percent
Valid	Disagree	2	4.3	4.3
	Neither	16	34.8	39.1
	Agree	15	32.6	71.7
	Strongly Agree	13	28.3	100.0
	Total	46	100.0	
	warehouse management systems operate in a way that Minimizes Loss of materials			
		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	4	8.7	8.7
	Disagree	4	8.7	17.4
	Neither	11	23.9	41.3
	Agree	23	50.0	91.3
	Strongly Agree	4	8.7	100.0
	Total	46	100.0	
	The company Generate a high return on investment			
		Frequency	Percent	Cumulative Percent
Valid	Disagree	3	6.5	6.5
	Neither	11	23.9	30.4
	Agree	22	47.8	78.3
	Strongly Agree	10	21.7	100.0
	Total	46	100.0	
All materials delivered On-time				

		Frequency	Percent	Cumulative Percent
Valid	Neither	11	23.9	23.9
	Agree	21	45.7	69.6
	Strongly Agree	14	30.4	100.0
	Total	46	100.0	
There is Uninterrupted material supply within the company				
		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	8	17.4	17.4
	Disagree	10	21.7	39.1
	Neither	6	13.0	52.2
	Agree	21	45.7	97.8
	Strongly Agree	1	2.2	100.0
	Agree			
	Total	46	100.0	

Table 4.7

Source: (SPSS Output, 2020)

On question 1, respondents were asked that the company Creates high Customer satisfaction. Out of 46 respondents, 15(43.5%) of the respondents agree with the question, 10(21.7%) neither agree nor disagree with the question, 12(26.1%) of the respondents strongly agree with the question, 9(19.6%) disagree with the question.

On question 2, respondents were asked that The Company Have Adequate inventory to run all projects. Out of 46 respondents, 15(32.6%) of the respondents agree with the question, 16(34.8%) neither agree nor disagree with the question, 13(28.3%) of the respondents strongly agree with the question, 2(4.3%) disagree with the question.

On question 3, respondents were asked that warehouse management systems operate in a way that Minimizes Loss of materials. Out of 46 respondents, 23(50%) of the respondents agree with the question, 11(23.9%) neither agree nor disagree with the question, 4(8.7%) of the respondents strongly agree with the question, 4(8.7%) disagree with the question, 4(8.7%) strongly disagree with the question.

On question 4, respondents were asked that The Company Generate a high return on investment. Out of 46 respondents, 22(47.8%) of the respondents agree with the

question, 11(23.9%) neither agree nor disagree with the question, 10(21.7%) of the respondents strongly agree with the question, 3(6.5%) disagree with the question.

On question 5, respondents were asked that all materials delivered On time. Out of 46 respondents, 21(45.7%) of the respondents agree with the question, 11(23.9%) neither agree nor disagree with the question, 14(30.4%) of the respondents strongly agree with the question.

On question 6, respondents were asked that ere is an uninterrupted material supply within the company. Out of 46 respondents, 21(45.7%) of the respondents agree with the question, 6(13%) neither agree nor disagree with the question, 1(2.2%) of the respondents strongly agree with the question, 10(21.7%) disagree with the question, 8(17.4%) strongly disagree with the question.

Correlation Analysis

Correlation analysis is also known as the Pearson's correlation coefficient is to examine the relationship between two variables. Specifically, a correlation coefficient finds out the degree to which variation in one variable is related to variation in another variable. In this study, Pearson's Product Moment Correlation Coefficient was used to find out whether there is a significant relationship between each independent and dependent variable.

Pearson correlation measures the existence (given by a p-value) and strength (given by the coefficient r between -1 and +1) of a linear relationship between two variables. It should only be used when its underlying assumptions are satisfied. If the outcome is significant, we conclude that a correlation exists. an absolute value of r of 0.1 is classified as small, an absolute value of 0.3 is classified as medium, and 0.5 is classified as large (Samuels, 2014). Pearson correlation as "measures the degree and direction of linear relationships between two variables". A correlation score of -1.00 means that there is a perfect negative relationship between the two variables while a correlation score of 1.00 means there is a perfect positive relationship between the two variables. A Correlation score of 0.00 means that there is no relationship between the two variables.

The below Pearson's Correlation Coefficient Matrix computed for Logistics Management on the performance of the organization in terms of Customer Service, Inventory

Management, Warehouse Management, Transportation Management, and Supply Management.

Correlations

		cs	IM	WM	TM	SM	OP
cs	Pearson Correlation	1	.547**	.694**	.516**	.545**	.514**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	46	46	46	46	46	46
IM	Pearson Correlation	.547**	1	.593**	.437**	.354*	.394**
	Sig. (2-tailed)	.000		.000	.002	.016	.007
	N	46	46	46	46	46	46
WM	Pearson Correlation	.694**	.593**	1	.419**	.469**	.533**
	Sig. (2-tailed)	.000	.000		.004	.001	.000
	N	46	46	46	46	46	46
TM	Pearson Correlation	.516**	.437**	.419**	1	.442**	.511**
	Sig. (2-tailed)	.000	.002	.004		.002	.000
	N	46	46	46	46	46	46
SM	Pearson Correlation	.545**	.354*	.469**	.442**	1	.814**
	Sig. (2-tailed)	.000	.016	.001	.002		.000
	N	46	46	46	46	46	46
OP	Pearson Correlation	.514**	.394**	.533**	.511**	.814**	1
	Sig. (2-tailed)	.000	.007	.000	.000	.000	
	N	46	46	46	46	46	46

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

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

Table 4.8

Source: (SPSS Output, 2020)

CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

This chapter provides a summary of the major findings, conclusions, and recommendations of the study. Then, conclusions will be discussed based on researcher perceptions added regarding study findings and limitations.

5.1 Customer service practice

According to the analysis, the customer service practice indicates that the majority of the respondents agree on employees' on creating long-term relationships with suppliers; logistics service responds quickly to construction site needs; the customer service applies up to date information for forecasting of construction sites 'needs; sharing technical information with sites and suppliers when required. Therefore this considered as the strength of the customer service unit and it adds a lot to the organization's performance.

However, the respondents disagree on the existence of electronic communication with suppliers for joint planning and say neither agree nor disagree on customer service practice that fulfills site orders in the promised date This indicates that the customer service fulfills site orders sometimes and sometimes not.

5.2 Inventory management practice

. The majority of the respondents are neither agree nor disagree and strongly disagree on the inventory management availing nice inventory information; whether there is a centralized inventory management system deployed throughout the company; whether there is on-time inventory Replenishment practice throughout the company; creating a collaborative arrangement with sites and suppliers for inventory management and having a system for wastage free utilization of available materials inventory, therefore, the company have a poor inventory management practice and it affects the organization performance.

5.3 Warehouse management practice

The majority of the respondents say neither agree nor disagree followed by strongly disagree and disagree on the practice of Regular stock reporting and monthly

inventory count system to detect material loss; Using of specialized material handling equipment; Applying Prevention mechanisms from damage due to temperature and humidity such as cement hardening; Scrap material disposal in a way that benefits the company; Systems that recognize identities of operatives enabling site warehouse managers to issue warnings to individuals of collision accident in prone zones. This shows that the existing warehouse management system is poor and it harms construction project facilitation, therefore, it affects the organization performance

5.4 Transportation Management practice

The majority of respondents agree on the ability to track the location of delivery vehicles en-route construction site; the Planning of alternative routes for delivery vehicles en-route to the construction site; the Instant identification of multiple materials delivered on-site which improves delivery vehicle turn around; the transportation system of the company like timely delivery of materials satisfy site requirement; Transportation and distribution of by using other transportation company reduces the cost of logistics; the company applies economies of scale and economies of distance to minimize transportation cost per unit

This leads to the current practice or system of transportation provides efficiency; effective information sharing between construction sites and increase efficiency of logistics management and resulted in increasing the performance of the organization.

5.5 Supply management practice

The majority of the respondents say agree followed by neither agree nor disagree on the practice of procured goods will be delivered promptly; procured goods are received with maximum quantity tolerance of the company; the requesting Sites order materials without appropriate priority; supply management system designed in the company target to minimize acquisition cost and logistics cost; the organization approach to the supplier has an impact on the success of supply. Except for the question asked about material ordered without a sequence or priority which is one of the characteristics of construction work the other response have a positive impact on the organization performance

From the finding, the detail results on correlation results are hereunder:

- ❖ The correlation between Customer Service and Organization Performance is positive and significantly correlated at $[r=0.514]$, $[P<0.01]$, this shows that the relationship between the two variables is good.
- ❖ The correlation between Inventory Management and Organization Performance is positive and significantly correlated at $[r=0.394]$, $[P<0.01]$ this shows that the relationship between the two variables is strong.
- ❖ The correlation between Warehouse Management and Organization Performance is positive and significantly correlated at $[r=0.533]$, $[P<0.01]$ this shows that the relationship between the two variables is strong.
- ❖ The correlation between Transport Management and Organization Performance is positive and significantly correlated at $[r=0.511]$, $[P<0.01]$, this shows that the relationship between the two variables is good.
- ❖ The correlation between Supply Management and Organization Performance is positive and significantly correlated at $[r=0.814]$, $[P<0.01]$, this shows that the relationship between the two variables is good. (See table 4.6 and 4.7)

Recommendation

- The company should have a well-established standard to check the level of customer satisfaction and take corrective action based on the results from the tool
- The company should use electronic communication like EDI or RFID which are currently available on the local or international market and enhance its communication with the respective sites and suppliers.
- The company should have a dependable order processing to deliver Sites orders in the promised date
- There should be a Regular stock reporting and monthly inventory count system to detect material loss
- It needs to apply a Prevention mechanism from damage due to temperature and humidity such as cement hardening. because this type of materials carry a significant amount of cash and once they are damaged they will cost the company in full and reduce the organizational performance in different ways

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