

AAU COLLEGE OF BUSINESS & ECONOMICS
SCHOOL OF COMMERCE

DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT



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The effect of vehicle maintenance management practices on operational performance: case of Ethiopian shipping and logistics service enterprise

BY:

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

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DECLARATION

I, the undersigned, declare that this thesis entitled “The effect of vehicle maintenance management on operational performance: case of Ethiopian shipping and logistics service enterprise” is my original work and has not been presented for degree requirement in any other university, and all the sources used to support this particular study have been appropriately acknowledged.

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CONFIRMATION

This is to certify that Abebe Zemelak has carried out this thesis on the topic entitled “The effect of vehicle maintenance management on operational performance: case of Ethiopian shipping and logistics service enterprise” under my supervision. Accordingly, i here assure that his work is appropriate and standard enough to be submitted for partial fulfillment of the requirements for the award of the degree of Master of Arts in logistics and supply chain management.

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Table of Contents

DECLARATION	ii
CONFIRMATION	iii
ACKNOWLEDGMENT	iv
Table of Contents	v
List of figures	viii
List of tables	viii
List of Acronyms	ix
ABSTRACT	x
CHAPTER ONE-INTRODUCTION	1
1.1. Background of the study	1
1.2. Statement of the Problem	3
1.3. Basic Research Questions	4
1.4. Objectives of the Study	5
1.4.1. General objective	5
1.4.2. Specific objectives	5
1.5. Definition of Terms / Concepts /constructs.....	5
1.6. Significance of the study	5
1.7. Limitations and Scope of the Study	6
1.8. Organization of the study	6
CHAPTER TWO-RELATED LITERATURE REVEIW	7
2.1. Theoretical literature review	7
2.1.1. Introduction	7
2.1.2. Vehicle Repair and Fleet Maintenance	10
2.1.2.1. Computerized Spare part management.....	10
2.1.2.2. IT aided system and modern technology availability.....	12
2.1.3. Vehicle monitoring systems	13
2.1.3.1. Maintenance scheduling	14
2.1.4. Driver Management and training	15
2.1.4.1. Vehicle inspection and maintenance training.....	16

2.1.5. Operational performances	16
2.1.6. Maintenance Management and Operational Performance	17
2.1.7. Operational Performance effectiveness and efficiency	17
2.2. Empirical literature review	20
2.3. Conceptual Framework of the Study	23
CHAPTER THREE-METHODOLOGY	24
3.1. Introduction	24
3.2. Description of the study area.....	24
3.3. Research Approach	24
3.4. Research Design.....	25
3.5. Target Population and Sampling Technique	25
3.6. Data sources and types	26
3.7. Data Collection Methods.....	26
3.8. Data Analysis Method.....	27
3.9. Validity and Reliability	27
3.10. Ethical Considerations.....	28
CHAPTER FOUR-DATA PRESENTATION, ANALYSIS AND INTERPRETATION.....	29
4.1. Introduction	29
4.2. Response Rate and Demographic data	29
4.3. Descriptive Analysis	30
4.3.1. Implementation level of vehicle maintenance management Practices	31
4.3.2. Measurement of operational performance	35
4.4. Relationship between Vehicle Maintenance Management Practices together and Operational Performance at Kaliti branch(ESLSE)	36
4.4.1. Correlation analysis	36
4.4.2. Assumptions of Multiple Regression Mode Analysis	38
4.4.3. Tests on Multicollinearity	38
4.4.4. Regression Analysis.....	40
CHAPTER FIVE-SUMMARY, CONCLUSION AND RECOMMENDATION	44
5.1. Introduction	44
5.2. Summary	44

5.2.1. Relationship between vehicle maintenance management practices & operational performance of ESLSE	44
5.2.2. Implementation level of vehicle maintenance management Practices	45
5.3. Conclusion.....	46
5.4. Recommendations	46
5.5. Suggestion for Further Study	48
References	49
Appendix-1	51

List of figures

Figure 2.1.A) Maintenance work order B) Vehicle inspection and repair slip	12
Figure 2.2 Conceptual framework	23
Figure 4.1 Normality test of regression	39
Figure 4.2 Scatter plot test	39

List of tables

Table 2.1 Maintenance Measures in order of Most Used to Least Used	19
Table 3.1 Reliability.....	28
Table 3.2 Reliability coefficient of each variables	28
Table 4.1 Overall Response Rate.....	29
Table 4.2 Demographic Information of respondents	29
Table 4.3 Vehicles Repair and fleet maintenance Practices	31
Table 4.4 Vehicles monitoring systems Practices.....	33
Table 4.5 Driver Management with Training Practices.....	34
Table 4.6 Measurement of operational performance	35
Table 4.7 Correlation Analysis	37
Table 4.8 Tests on Multicollinearity.....	40
Table 4.9 Regression Analysis.....	41
Table 4.10 Analytical model.....	41

List of Acronyms

ESLSE: Ethiopian shipping and logistics service enterprise

LPI: Logistics performance index

GPS: Global positioning system

SPSS: statistical package for social sciences

VM: Vehicle Monitoring

VRFM: Vehicle Repair and Fleet Maintenance

DMT: Driver Management and Training

ABSTRACT

The choice of the maintenance management practices applied impacts heavily on the performance of the firm. The study was guided by the following general objective, which is to examine the effect of vehicle maintenance management practices on operational performance of Ethiopian shipping & logistics services enterprise. This study was adopted the descriptive with inferential statistics on explanatory research design to obtaining the information about the study topic. All responses were collected; descriptive and inferential analysis was done by using Statistical Package for Social Sciences (SPSS) version 26.0 software. The study includes three independent variables in which all of them were measured on a 5-point Likert-Scale. The study found out that all determinant variables of vehicle maintenance management practices to moderate extent. The study tells that there exists a strong relationship between vehicle maintenance management practices and operational performance. The study thus concludes that increase in vehicle maintenance management practice would result in enhanced operational performance. The study recommends that the branch to conduct an evaluation of these strategies, and how exactly they are implemented. The study thus suggests that further studies to be conducted on other practices and Performance Metrics for the Maintenance Function.

Key words: *vehicle maintenance management practices, operational performance.*

CHAPTER ONE

INTRODUCTION

1.1. Background of the study

The development of most developed countries is stands around the transportation industry, Governance, service team, cannot move from one part of the country to the other without transportation. More so, a country is insecure without a transportation means for its security service men. Effectiveness of transportation is the basis for the fulfillment of countries need, individual needs, and company's needs and hence form the primary need for development at large(Mei and Afli, 2017).

The management of operations under transportation is comprised of all types and modes, including tracking and managing every aspect of vehicle maintenance which includes fuel costing, routing and mapping, warehousing, communications, EDI implementations, cargo handling, carrier selection and management, and even accounting(Abe asuncion, 2014).

Vehicle repair and maintenance is the most important to any fleet management organization since it includes issues of changing oil, routine servicing as well as managing spare parts. As some studies have discovered that driver training, vehicle maintenance and vehicle design are ranges of relative low cost measures for saving 10% or more fuel for fleet operation (Baas &Latto 2005). However, Bell (2013) noted that changing oil is properly done it will increase vehicles engine lifespan by using fuel additives to ensure that the engine injectors are always clean. When vehicle oil is not change adequately, it will permit dirt, particles and acidic substances to degrade the engine parts. Chevrolet (2015) states that oil change is related primarily to gas mileage and can result to a decrease in fuel consumption. Having the oil and filter changed is one of the most common maintenance requirements for the performance of your vehicle(Kraa and Agbenyo, 2020).

It is common for enterprises to work with maintenance as a focus point of profit. A greater knowledge of maintenance and its ability for long term profiting have increased the interest in the topic. It is target on minimizing the downtime and the key to success is to ensure that proactive maintenance is properly implemented. Hence, by leaving the firefighting perspective and striving to use proactive maintenance there is a lot to gain. Less failure,

minimized downtime, lowered stress and higher quality, all working in the favor of profit(T.*Getachew*,2017).

In past periods of years, Maintenance has been considered as a necessary evil, but it is in fact rather a center of profit than just unavoidable and unpredictable expense (Alsyouf, 2007). If effective maintenance policies are used, failures or defects can be reduced to a minimum level, which can result in great savings. Therefore, due to its role in the corporate long-term profitability, more and more worth is put on maintenance(T.*Getachew*, 2017).

“According to Al-Turki (2011), maintenance management are the activities of planning, organizing, implementing, monitoring and controlling in order to sustain a certain level of availability, value and reliability of the system and its components (assets) and its ability to operate to a certain standard level of quality. Therefore, the choice of the maintenance management practice applied impacts heavily on the performance of the firm. The main measures of operational performance of a firm are reliability, maintainability, productivity, efficiency, availability and production per unit cost, among others (Wilson, 2002). Since Firm’s maintenance costs are normally high (Al-Turki, 2011) application of best maintenance management practices can boost a firm’s operational performance”(T.*Getachew*, 2017).

Since operational performance has main measures such as are reliability, maintainability, productivity, efficiency, availability and production per unit cost, among others (Wilson, 2002).The current vehicle maintenance management practices are creating some effects on operational performance. So that, the researcher wanted to show the effect of vehicle maintenance management practices on operation performance in the case of Ethiopian shipping and logistics service enterprise. This study concerns the current condition of the maintenance system and its effect on the operational performance of the enterprise in the inland transport management under Freight forwarding sector.

1.2. Statement of the Problem

Fekadu, (2013) studied general logistics practices in Ethiopia. In his study logistics management system and lack of coordination of goods transport, low level of development of logistics infrastructure were assessed as the constraints of Ethiopian logistics system. In addition to these factors, the performance in ESLSE, is affected by excessive delay in clearance and transportation, and lack of capacities (Technical, financial, IT, human and material). And to achieve the target, the enterprise is implementing many practices like having vehicles as a substitution of the old and damaged vehicles. Since those new purchased vehicles are modern they need well-organized system of maintenance and good drivers with skill and behavior, But under his study he did not consider the vehicle management issues with respect to vehicle maintenance practices that are affecting the performance of ESLSE in terms of trip.

In fact, a good transport system in logistics activities could provide better logistics efficiency, reduce operation cost, and promote service quality. A well-operated logistics process could increase both the effectiveness of the government and enterprises. By means of well-handled transport structure, goods can be move to the right place at right time in order to satisfy customers' demands. It brings effectiveness, and it builds a bridge between producers and consumers. Therefore, transportation is the base of efficiency and economy in business logistics and expands other functions of logistics system. In addition, a good transport system performing in logistics activities brings benefits not only to service quality but also to company competitiveness(Mihretuet *al.*, 2019).

The fleet (vehicle) section of an enterprise is therefore one of the areas to the achievement of organizational goal. This is because the fleet section has a duty for the movement of both people and goods of the organization by using vehicles. This helps to speed up business operations and processes. In other words, the pressure to deliver faster and cheaper has made vehicle utilization an important aspect of fleet management (Jonsson, 2008; Waters, 2009). Fleet (vehicle) management can include a range of fleet management functions such as vehicle financing, vehicle maintenance, vehicle telemetric which includes tracking and diagnostics, driver management, fuel management, and health and safety management (Choudhary, 2013). So that the vehicle management and vehicle maintenance practices must be productive since it has a great role for organization performance.

Coyle et al (2015), argues that the fleet management function is viewed as the glue that holds the supply chain together. Supply chains may become transport driven as opposed to demand driven than they were during 1990s and early 21st century. Schorpp (2011) argues that there is need for dynamic re-planning in fleet management to react in the short term on newly occurring requests & other changing information. The primary objectives are the minimization of empty travelled distance, the minimization of delay and high vehicle utilization(Giathi, 2016). Currently ESLSE has about 387 trucks including the 199 trucks, from one of the popular brand Renault Trucks, a French automotive company and with the aim of facilitating import and export capacity, has purchased 188 heavy duty vehicles from Chinese company which is Sinotruk International Plc.(*eslse newsletter vol 04, no.76*).

Optimization of maintenance strategies to addresses such complex operating context is critical. There is a room for maximizing asset performance, prolonging effective operating time, minimizing repair costs and minimizing consequences of unplanned downtime, by maximizing the interval between scheduled maintenance services.

Ethiopian Shipping & Logistics Services Enterprise is trying to have solutions mostly around the above mentioned capacity development areas and one of the overlooked areas is transport and vehicle management issue. Thus, this research work has focused on the current maintenance systems and the effect of vehicle maintenance management practices on operational performance in the case of Ethiopian shipping and logistics service enterprise.

1.3. Basic Research Questions

In conducting the research, the following points are the basic research questions:

- ❖ To what extent do the vehicle maintenance practices affected the operational performance of the enterprise.
- ❖ How do vehicle monitoring system practices affect the operational performance of the enterprise?
- ❖ How the driver management and training practices affects the operational performance of the enterprise?
- ❖ Which of the practices can play a significant role in the operational performance of the enterprise?

1.4. Objectives of the Study

1.4.1. General objective

In general, the objective of the study is to examine the effect of vehicle maintenance management practices on operational performance of Ethiopian shipping & logistics services enterprise.

1.4.2. Specific objectives

Specifically, the study has the following objectives;

- ❖ To determine how vehicles maintenance management influences operational performance in ESLSE.
- ❖ To assess how vehicles monitoring system practices affects operational performance in the case of ESLSE.
- ❖ To assess how driver management and training influences operational performance particularly fleet efficiency in the case of ESLSE.
- ❖ To identify the degree of practices those are affecting operational performance of the enterprise.

1.5. Definition of Terms / Concepts /constructs

Fleet management: is the management of a company's vehicle fleet, which includes a range of functions, such as vehicle financing, vehicle maintenance, vehicle telematics with tracking and diagnosis, driver management, fuel management & safety management (Borirugetal, 2009).

Operational performance: is defined as Firm's performance measured against standard or prescribed indicators of effectiveness, efficiency.(Welansa, 2018).

Maintenance down time: downtime involves the time required for detection, repair or replacement and restarting the system that implies unavailability of services and facilities. The occurrence of downtimes is likely to affect the activities of core business.(Groote, 1995)

1.6. Significance of the study

Since the enterprise is purchasing heavy-duty vehicles to accomplish the logistics service by increasing operational performance. The study would help to have Practical significance on

enlightening the relationships between vehicle management with vehicle maintenance and the operational performance of ESLSE. Therefore, it would be a contribution to the management body of the company to have a better image and facilitate realistic, appropriate and timely measures to improve vehicle maintenance management activities to have an excellence performance. It can be as a reference for other who would like to conduct further studies and provide useful information to policy makers, researchers, academic scientists and other stakeholders. In addition to these, the study can be used as a tool for improving the operational performance.

1.7. Limitations and Scope of the Study

This study focused only in Ethiopian shipping and logistic service enterprise on enlightening the effect of vehicle maintenance management practices on operation performance of ESLSE and limited on the determinant factors, which have direct impact on operation performance in relation with maintenance. Due to time and budget constraint, the study will have a focus on Kality branch (Addis Ababa). Moreover, most of the respondents failed to answer open-ended questions and difficulty to get empirical literature in the related area.

1.8. Organization of the study

The research has five chapters. The first chapter includes introduction of the study, background of the study, problem statement, and purpose of the study, research question, and significance of the study and direction for further research and organization of the study. The second chapter deals the theoretical framework of the study of different authors about the vehicle maintenance management practices. Attempts are there to see the need for vehicle maintenance management and the practices under maintenance. The third chapter has the research methodology of the study together with ethical consideration. Chapter four summarized the results of the study and interprets and also discusses the findings. Finally chapter five comprises four sections, which includes summary of findings, conclusions, recommendations and suggestions for future study.

CHAPTER TWO

RELATED LITERATURE REVIEW

2.1. Theoretical literature review

2.1.1. Introduction

Vehicle maintenance and Maintenance Management Practices

Marquez and Gupta (2006), defined management of maintenance as the activities of management that determine maintenance objectives, strategies and responsibilities and implement them by means of maintenance planning, maintenance control and supervision and several improving methods including economical aspects in the organization. Marquez and Gupta (2006) defined maintenance management as a process and as a framework. As a framework, they noted that it is the essential supporting structure and the basic system needed to manage maintenance effectively. As a process, it is the course of action and the series of steps or stages to be followed(M, 2014).

Ben Daya et al. (2009) present a handful of important factors to use when evaluating and measuring maintenance productivity. These factors together create a system that needs to be incorporated with the strategy at different hierarchical levels in the organization in order to create a comprehensive picture. This section is a description of the system and the links to strategy and the text is based on information from Ben Daya et al. (2009) if nothing else is stated.

The system consists of six parts: Value created by the maintenance; Allocations of resources; Health, safety and environment; Knowledge management; new trends in operation and maintenance strategy; and Changes in organizational structure. These are to cover the most important part of the maintenance productivity, but it is important to remark that they do not cover all aspects.

1. Value created by the maintenance: In fact, it is the most important factor because of its business relation. In all businesses, there is a need for creating value and if a department is not adding value, it needs to be re-structured.
2. Allocations of resources: The resources are the foundation of maintenance and the focus here lies on the effectiveness of the resources. To evaluate if the right

resources exists and if they are used in the right way, the allocation of these are important to look at.

3. Health, safety and environment: An organization should not only be productive in terms of production output but should also look at health, safety and environmental factors. For the organization said to be efficient it should have a low number of incidents and accidents.
4. Knowledge management: Almost all businesses are using more technology and information and communication technology (ICT). To handle the change, the knowledge that exists in a company needs to be taken care of even though operations become more automatic.
5. New trends in operation and maintenance strategy: Companies need to adjust their strategy to the changing environment and quickly respond to new demand. So to have improved performance there must be new and modern strategy.
6. Changes in the organizational structure: The productivity measurements need to reflect the focus of the organizational structure which may focus on number of employees regarding work diversity. The focus at individual organizations can be very different and the used measurements can and should specify the task expected from a person as a duty.(Adolfsson, 2011).

Regards to fleet management, several theories have been developed and utilized. The following are some of these key theories underpinning transport and fleet management. The concept of replacement theory has to do with the acquisition of new fleet and maintenance of the fleet (Gitahi and Ogollah, 2014).

Once such unserviceable part is identified, then there is need for replacement in order to make the product serviceable. The other theory applicable to transport and fleet management is the resource-based theory. The theory has an intra-organizational dimension with the suggestion that performance is a result of firm-specific resources and capabilities (Wernerfelt, 2008). The basis of the resource-based view is that successful firms will identify their long term competitiveness by creating distinctive and unique capabilities, which may often be intangible in nature.

The resource based view implies that, businesses that are successful tend to project their competitive nature in future based on their distinctive capabilities that tend to be intangible in

nature. This is why Rumelt (2008) believed that, a firm's strategy should be designed based on its capabilities that the firm contains like number of skilled man power as well as its unique resources. Lastly, studies with respect to technology diffusion theory generally points to the fact that the final beneficiary or the use of a particular innovation is the same person considered as the decision maker or the said adopter (Gitahi and Ogollah, 2014). This person who is the decision maker is the one who is exposed to novel products, technology or new services available as well as seek varieties of information with respect to innovations. It is generally fact and clear that the originator or key decision maker of such innovation in any organization does not necessarily become the ultimate beneficiary of the outcome of such decision. The implication of this theory is that although vehicle owners are responsible for making the ultimate decision with regard to what fleet type to use in order to support overall operational activities, they are not directly involved with the day to day running of the vehicles. Key parties at the operational level such as fleet supervisors, drivers and mechanics among others are directly involve in ensuring successful operational objectives are achieved. For instance, vehicle monitoring and tracking devices are manufactured by independents manufacturers (innovator) which are used by third parties for monitoring and tracking their fleet of vehicles(Kraa and Agbenyo, 2020).

Maintenance, as being considered as a crucial part of the success and image of the truck brands, is very important for the vehicle to operate at its optimum condition and thereby ensuring a consistent uptime of the vehicle throughout its life span. If the maintenance is achieved with skilled persons who have knowledge how to fix a part for long life span, then the vehicle will stay long without having defects. Many companies, which have a focus on maintenance, started realizing that if they wanted to manage maintenance effectively, they should include it in the general scheme of their organization and manage it with interaction with other functions (Crespo Márquez et al., 2009). When this is achieved, the importance that the maintenance deserves can be given and can also be developed as an additional function to the organization; with the purpose of generating products that satisfy internal clients and the fulfillment of some goals of the organization. Therefore, creating standard way to have good vehicle maintenance to drive maintenance activities has become a research topic and a fundamental question to reach the effectiveness and efficiency of maintenance management and to fulfill enterprise objectives” (Crespo Márquez et al., 2009, p.168).

The importance of maintenance to industry for Marais (2013) is about developing methods ensuring that maintenance resources are used efficiently, as they can be significant drivers of competitiveness or lack in case of mismanagement.

“There are various maintenance management practices (Veldman, J., Wortmann, H., &Klingenberg W., 2011 and Al-Turki, 2011). Organizations need to strategically choose the best maintenance management practices which offer them the best operational performance (Marquez & Gupta, 2006). Accordingly to Veldman et al., (2011), maintenance management practices can generally be classified into two i.e. unplanned and planned maintenance”(M, 2014).

2.1.2. Vehicle Repair and Fleet Maintenance

According to K.Schneider and C.R.Cassady (2004) the vehicle maintenance system provides information on every vehicle that are found under the control of the organization and covers all the vehicles expenses and repair covering cars, trucks, and vans. From this aspect, fleet managers will be able to budget all fleet maintenance costs. An automated maintenance is best and used for fleet management of tracks the vehicles and their parts and also planned maintenance of the vehicles. This makes the tasks of repairing and maintaining fleets easier (Borirug et al, 2009). Every kinds of business whether it is shipping, manufacturing, mining, and/or service-oriented business need an equipment/vehicle or any distributing way to deliver its outputs so as equipment is an ‘asset that is critical in the fiercely competitive global economy’ (Murphy, D. 2002). Within age and usage equipment degrades and becomes non-operational, hence there will be a need controlled through good operating practices which can give extra lifetime for the equipment/vehicle and proper preventive maintenance actions(T.Ambaye, 2019).

2.1.2.1. Computerized Spare part management

In the enterprises, a repair shop handles the repair of many different types of repairable (compressors and pumps). So that there must be a use of these repaired parts to keep the store balance until new purchased materials are fulfilled. The consumables are items that discarded after replacement and bought new from a supplier. Generally, these are relatively cheap items

such as gaskets. Hence, these different part types generally are also connected to different maintenance strategies(T.Ambaye, 2019).

Spare parts are parts that are required to replace or to be used as input for maintenance activity in support of an existing part in a machine. They can range from nuts and bolts to ball-bearings and expansion joints. The terms spare part, service part or aftermarket parts are used interchangeably.

Arts (2013) distinguish three different types of maintenance spare parts which are stated as retables, repairable and consumables. He clarify that retables as items that constitute a sufficiently large subsystem of the original equipment to warrant a separate usage based maintenance strategy by giving examples include aircraft engines and elaborate weapon or radar systems on frigates. Computerized system of spares may aid which parts are going faster and which are preferable so that the enterprise will manage parts to be purchased. Items that are repaired after replacement after which they are ready-for-use (RFU) again are repairable. Accordingly, contrary to retables, repairable do not have their own usage based maintenance strategy, and are not usually individually tracked and traced. (Ingenieurwissenschaften, 2018)

The primary reason for the study of spare parts management is its direct influence on customer service. In most cases, downtime costs (both operational and financial) for machines, of which a part has fails and requires a replacement, are extremely high. Unavailability of a simple and inexpensive part can result in lost production (and therefore idle manpower and inoperable machine or lost capacity), delay in delivery of finished goods resulting in cost penalty, present loss of profit as well as future loss in the form of goodwill erosion. With the growing importance of services and the high dependency of after-sales service on spare parts management, it becomes important not to underestimate the role that timely arrival of spare part demand has so that the customers are satisfied, and if possible delighted(Ingenieurwissenschaften, 2018).

It is significant to classify spare parts into groups or families so that the resulting decisions, especially regarding demand forecasting and inventory control are assisted and the computerized system will have a value. Even though efficient and faster computing systems now make complex demand and inventory modeling possible. Incorporating different policies for each spare part is a tedious and complicated task and therefore, practitioners are

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KALLITY BRANCH
VEHICLE INSPECTION AND REPAIRSLIP

FORM NO: ESLSE KB/TD/017
From No 0001

Plate No _____ Side No 84-007 Truck Trailer Date In 13.08.14 Time 11:30

Meter _____ H. Meter _____ Equipment No _____

Work Order No 58134 Group Code _____ To Mechanical Sign _____

No	Work Description	Employ No	Starting Date & Time	Completed Date & time	Standard time	Actually time	Labour cost
0	Repair hand Brake Handel air system	1824	15/08/14 4:00	15/08/14 8:00	3hr	3hr	
	21-007 W-158135 Straighten rear front Right Side Wheel Cylinder Rods				2hr		

Comment _____

Inspector G. M. IAS sign _____ Date Completed 15/08/14 Time _____

Inspected By _____ sign _____ Date _____ Time _____

Approved by (Q.C) _____ sign _____ Date Released _____ Time _____

After recording all defects the inspector must go to each shops for distributing purpose, which takes so much time starting from listing the defects to finalizing distribution. So that, if IT aided system and modern technology is available, then the time will be saved and the maintenance will be done within short period of time by minimizing the time taken of inspection.

With respect to modern technology availability: for instance, when there is a defect or abnormal tyre wear happens, the wheel condition will be checked and alignment will be done. But the system to do this is not modern still they uses string which is old system and unreliable. In addition, by using maintenance management software's such as ERP (enterprise resource planning) system the maintenance can be pure and does not lead to have rework after the vehicle is released from garage to the operational.

2.1.3. Vehicle monitoring systems

Monitoring systems is functionally different to vehicle and fleet management. Fleet management includes controlling the use and vehicles maintenance and related administrative functions including coordination with dissemination of tasks and related information to solve the heterogeneous scheduling and vehicle routing problem (Sorensen

and Bochtis, 2010). Like using of alerting system to inform or remind drivers that the schedule of service is reached and to keep the action on the time.

For vehicle management and monitoring, one of the main applications is the global positioning system (GPS) technology tools (Yi-Chung Hu et al 2015). “The whole purpose of a vehicle is to move people and/or their goods from one place to another. Other than the major frequently considered criterion of on time delivery, as Kuehling (2018) stated, other plenty of things such as current location, destination, schedules, traffic, preferred routes, diversions along the way, parking once you’ve arrived and fuel levels have to check and balance for vehicle tracking system in logistics.” (Kuehling 2018).

2.1.3.1. Maintenance scheduling

Maintenance scheduling is the process whereby all the resources required executing maintenance activities are planned for execution within a specified period (Matt 2015). Maintenance activities carried out during maintenance includes inspection, testing, servicing, repairs and replacement. Competent staffs, those are allocated the right jobs and given correct spare parts at the most appropriate time, can achieve maintenance excellence.

The principles of maintenance scheduling are: planning for minimum skill level needed, scheduling and job priorities for critical tasks, scheduling from highest skill and man power available, scheduling for every work hour available, having crew leader to handle current day’s job and measuring performance against compliance to scheduled program (Richard 2013). The principles if correctly applied will greatly contribute to the overall success of maintenance scheduling.

Maintenance scheduling advantages include; minimizing of idle time, reduced breakdowns and delays, effective utilization of human resource from both maintenance and operations leading to lower costs of maintenance. To attain maximum output maintenance scheduling should be supported with continuous improvement, well documented information of equipment, quality spares availability, skilled workforce and good support from stake holders(Kibet and Nairobi, 2016).

2.1.4. Driver Management and training

Baas (2012) discusses that drivers behavior and level of education are directly related with enhancements in fuel efficiency with damage free activity and safe driving practices. Hence, driver training is expected at improving fuel-efficient driving and decreasing incident rates. Following their finding, a number of initiatives were introduced, aimed at improving driver behavior and education.

The enterprise has an aim of achieving travel time strategy as customers demand their shipments be delivered as they require on the date needed and to have trips above 3 round. Accordingly, the difference is largely created by differences in road speed, gear selection, the engine speeds at which gears are changed, aggressiveness of accelerator and brake pedal use, and the amount of time the driver leaves the vehicle idling (Baas 2012). Baas (2012) recognized steps taken to improve driver management in which level of recognition was directly related to individuals' safety behavior, customer service and incident rates. The drivers' recognition (credit) scheme encouraged honest reporting. The steps includes developing a comprehensive pre-start check sheet, ensuring that drivers understand that they are responsible and to be accountable for their actions, improving driver recruitment procedures, educating and coaching drivers about vehicle standards and visual inspections. Holding regular driver forums, having a culture where a driver can intervene in any unsafe or non-compliant act, preparing monthly feedback reports on individual driver performance and vehicles related to speed and fuel consumption. Developing a culture of continuous improvement within the driver teams to focus on total fuel consumption and driving techniques, including urban operation and all drivers participating in an individual driver recognition/incentive scheme that rewards positive behaviors and outcomes (Baas 2012).

According to Polo, Cervai, &Kantola (2018) having training is an activity to promote an employee to do competency study on knowledge, skill, and manner that would be useful for work. The quality of the company's conducted training has impacts to enhance the employee's skill, so then the performance increased (Dimri&Misra, 2008). The research by Elnaga& Imran (2013) also states that training has an impact on employee's performance. The training program is a stimulant that the employee requires to enhance their performance and skill so then the organization's productivity increased(Informasi, 2020).

As norm of reciprocity, employees (drivers) who perceive a high level of organizational support for their wellbeing feel a reciprocal sense of obligation for the firms wellbeing such that they work hard to meet the firms goals (Aselage and Eisenberger 2003; Fuller et al. 2006). “We expect drivers who perceive their firm as supporting them to be more likely to reciprocate by expending their best effort to meet the firm’s objectives, thus leading to a higher level of firm performance. Improved driver performance will lead to improved operational performance.”(Saldanha, Hunt and Mello, 2013).

2.1.4.1. Vehicle inspection and maintenance training

If the maintenance workers have regular training on maintenance issue and inspection they will update their knowledge and also gather concepts about modern technology. The enterprise with old system of maintenance and having modern vehicles is destructive. Self-efficacy according to Kreitner&Kinicki (2003) is someone’s self-confidence on the opportunity in accomplishing certain tasks. A similar thing also stated by Bandura (1997) that self-efficacy is stated as an individual’s confidence or their inability to show certain behavior. Self-efficacy can be stated as a personal factor that separating everyone’s transformation. Previous research, Ballout (2009) conclude self-efficacy has strong affluence and significant on career’s success.

In fact, Self-Efficacy acts as a self-motivation mechanism, where is someone sees high competence in him then they will set their own goals and automatically producing more efforts and persistence to accomplish that Guglielmi, et al. (2012). Mckeown& Cochrane (2017) also shows that self-efficacy is a variable that has a significant impact on work engagement.

2.1.5. Operational performances

Operational performance can be taken as organization’s performance measured against standard or prescribed indicator of effectiveness, efficiency and environmental responsibility such as cycle time, productivity, waste reduction and regulatory compliance in which their measurements is key for continual improvement process (Welansa, 2018).

Al-sultan and Duffuaa (1995) recommended that maintenance controls should be improved(It technology aided) in order to achieve maintenance optimization. Sharma and Yadava (2011)

noted that the best maintenance optimization practice is the one which considers maintenance policy, cost and reliability measures.

Wilson (2002) identified some business processes, which should be used for optimizing operational performance of enterprises. These are: minimizing costs of maintenance, maximizing profitability by adopting optimal maintenance practices to reduce maintenance costs, maximizing plant utilization and capability and retaining high asset value, maximizing performance efficiency and maximizing work safety at economic cost(M, 2014).

2.1.6. Maintenance Management and Operational Performance

Since maintenance management for operational Performance is important there must be close attention to maintenance measures, measurement and management in order to reduce organizational operational costs, improve the organizational efficiency and effectiveness. According to Parida and Al-Turki (2006), there are important factors in implementation of maintenance performance measurement and management some of these are; measuring the value created by maintenance, justifying investment, revising resource allocations, health, safety and environmental issues, focusing on knowledge management and adapting to new trends in operation and maintenance management. Therefore, operational performance has to enhance through proper maintenance measurement and management to ensure organization success.

According to Gomes et al., (2011) technical, economic, safety and human resources the most used maintenance performance measurements and also they determines that the least utilized measures were: training/learning, skills/competencies, work incentives, process performance, resource utilization, maintenance capacity, customer satisfaction and employee satisfaction. Further, Gomes et al., (2011) noted that, whereas cost is an importance measure, future research should also focus on deriving practical measures aimed at capturing the human factor of the maintenance performance effort. They studied and found out that the most used maintenance measures in order of most used to least used. (M, 2014).

2.1.7. Operational Performance effectiveness and efficiency

The performance of an organization refers to a detailed analysis of not only organization's productivity but also the efficiency in conducting. This may include all the measures

undertaken to ensure that the operation costs are minimized while attaining the organizations objectives (Hack man, 2008). This includes the ability to maximize the available resources, balancing the outputs and inputs and scaling up the efficiency in how the activities are conducted. Performance measures are used to gauge the extent to an organization meets its set targets. Most organizations have been established to evaluate their performance based on cost and efficiency (Jayne et al, 2010). This includes doing all the expected duties at the best quality whilst incurring the least costs. Through this, the transportations costs are minimized and thus, the gains accrued are boosted. However, in addition to the financial measures, there are non- financial measures which aim at capturing the entire effectiveness of the organization (Onyango, 2011).

These non-financial measures of performance include profitability, quality responsiveness, effectiveness, flexibility and reliability (Bwari, 2016). These are used to determine the how effective the organization is in accomplishing its tasks and operations.

Performance measurement is the process of quantifying the efficiency and effectiveness of the undertaken actions. Effectiveness is understood as the degree of fulfilment of customer expectations, while efficiency is a measure of the extent to which business assets are used to provide a given level of customer satisfaction (Neely et al., 1995). In turn, the performance measuring system should be understood as a set of indicators used to quantify the efficiency and effectiveness of operations (Shepherd & Günter 2012).

A variety of measures needs to be investigated to measure general or specific performance of logistics service providers regarding transport activities (Van Donselaar et al. 1998), timeliness and accuracy (Bromley et el, 2001), delivery performance (Stewart, 1995), personnel scheduling and safety measures (Mejza et al., 2003).

The time and service aspects of transportation are vital. Shipments must move timely, it includes Customers demand their shipments be delivered as they require on the date needed, by the carrier preferred, in the proper shipping packaging method and complete, both shipped complete and delivered complete and in good order. Being able to have a transportation program witch can do this provides customer satisfaction and can give your company a competitive advantage.

Assessing the performance in terms of travel times is important for trucks due to their need for just-in-time delivery strategies. Truck data related analysis and performance measures conducted in the past include estimating the number of trips in a movement analysis zone, computing freight or truck travel time reliability measures, examining the effect of sample size, identifying and ranking road bottlenecks, assessing daily truck delay and delay cost (Liao, 2014), and estimating truck travel time (Monsere et al., 2009). Generally as Scott (1998) states that the minimization of consumption fuel and the maximization of vehicle utilization with having better maintenance are the tools that can be used to improve operational efficiency (Meseker 2018). Gomes et al., (2011) found out that the most used maintenance measures in order of most used to least used were as follows: (M, 2014).

Table 2.1 Maintenance Measures in order of Most Used to Least Used

Maintenance Measures in order of Most Used to Least Used	
1) Cost	20) Downtime cost
2) Overall equipment effectiveness	21) Defect
3) Availability	22) Labor cost
4) Quality	23) Equipment losses
5) Mean time before failure	24) Accidents
6) Tasks/jobs activities	25) Work orders
7) Mean time to repair	26) Tools
8) Materials	27) Time
9) Equipment	28) Service level
10) Downtime	29) Man power
11) Labor	30) Inventory cost
12) Failures frequency/rate	31) Mean time to failure
13) Reliability	32) Flexibility
14) Productivity	33) Events/occurrences/counts
15) Spares parts	34) Efficiency
16) Maintenance strategies/types	35) Cycle time (Delivery)
17) Human resources	36) Breakdowns
18) Planned maintenance	37) Breakdown maintenance
19) Maintenance organization	

From the above list, downtime (the period that the vehicles become out of operation) must get focus to minimize the maintenance time taken in garage.

2.2. Empirical literature review

According to the 2020 World Bank report, Ethiopia is ranked 162nd in global logistics performance index (LPI) in 2019, from its place 138th in 2018. This shows that the country's LP is not only one of the poorly performed in the world but also it is declining. There are several factors that determine the logistics performance index (LPI) and among these and the most important are international shipment, logistics quality with competence and tracking and tracing timelines. The major government organs that constitute for betterment of the LPI are Ethiopian Customs Authority and ESLSE provided that the major role is played by ESLSE. Organizational performance of the ESLSE regulates the performance measure of logistics, facilitates coordinated integration among sectors and promotes mobilization of the logistics service to foreign direct investors and creates opportunity to economic development of the country.(Y.Getamesay, 2021).

Despite the previous studies, professional logisticians expressed Ethiopian logistics performance a lagging facility characterized by lack of skilled manpower, poor infrastructure facilitation, very high lead time for arrival of goods and unreliable tracking and tracing of goods after shipment (World Bank, 2019). According to World Bank's report, it will take 123 days in order to process bank permit and import goods to Ethiopia, the lead time for imported goods to be cleared from ports is 60days. Ethiopia is in the least position taking 60 days (giving it the highest number of days in the world) to complete export of goods through airport or port supply chain.

Abebe H. (2020) revealed that the inland port and terminal development contribution found substantial amount of benefit for Ethiopian logistics industry enhancement and serves as a simplification gear for major import/export goods flows of the country. The research study findings identified unavailability of sufficient trucks and port equipment, skilled manpower, computerized system to enhance the operational activities in branches and dry ports such as Modjo dry port and terminal and indicated lack of these factors lagged the daily port operations of the inland port and terminal.(Y.Getamesay, 2021).

Based on the studies of (Debela, 2012&Tadesse, 2006), Ethiopia's freight transport practice is characterized by a number of problems. These problems, such as underdeveloped and fragmented management system, inadequate and inappropriate fleets of vehicles and other means of transportation, poor transport and logistics infrastructure (roads, warehouses and cold chains, etc). In addition, very high accidents which is ranked among the worst in the world and congestion in cities at inlets/outlets of cities, lack of coordination of goods transport, damage of goods and quality deterioration due to inappropriate storage, packaging, and transpiration.

The current status of logistics practices in Ethiopia is assessed by Fekadu (2013) with the aim of identifying the gaps, potentials and constraints for development of effective and efficient logistics system using information from secondary sources to carry out the assessment. In addition, he found that Ethiopian logistics system is characterized by poor logistics management system and lack of coordination of goods transport, low level of development of logistics infrastructure and inadequate fleets of freight vehicles in number and age, damage and quality deterioration of goods while handling, transporting and in storage. This coupled with lack of sea port resulted in poor linkage of producers (farmers) to the consumers (market) and non-competitiveness of Ethiopian goods on global market, which compromised livelihood of the people and economy of the country.

The density and quality of transportation infrastructure, according to his research, is quite low. Seventy percent of the population in rural areas does not have access to all-weather roads.

- The number and age of freight vehicles are insufficient to meet the country's transportation needs. Because the country's development is outpacing demand, the number of enterprises that can transport commodities into the country is insufficient, or they are unable to do so owing to age or a lack of proper upkeep.
- In terms of qualified human resources, management abilities, and the number of fleets of vehicles, the major freight transportation corporations are undercapitalized. This indicates that better vehicle maintenance management practices are required to improve company performance and ensure customer satisfaction.

As a result, he finds that an efficient and effective logistics system is required to address these socioeconomic issues, and that the following steps must be taken.

- ✓ There is urgent need for research on the logistics gaps identified and human resource needs in freight transport and logistics needs of the country. Ethio-Log maybe supported financially by government of Ethiopia and international funding agencies and technically by SLU to carry out research and human resources development in the sector.
- ✓ *Transport companies need to be encouraged to build their capacity in terms of human resources, number and better age of their vehicle fleets, coordination of their services, and integration of their services with the services of warehouses and terminals. Warehouses and terminals are recommended to do value adding activities like consolidation, packaging, etc*

Any ineffectiveness of operations and capacity constraints can threaten the growth of the organization's service and, therefore, a pressing problem that will quickly get worse, unless a critical action is taken. But, empirical studies on the subject matter have shown that the Ethiopian logistics system is characterized by a deficient logistics management system and a lack of coordination of freight transport. And also a low level of development of the logistics infrastructure and inadequate fleets Vehicles in number and age, damage and deterioration of the quality of the goods during handling, transport and storage(Debela, 2013). Therefore, this study will focus on practices that have an effect on operation.

2.3. Conceptual Framework of the Study

Based on the nature of the study and the above literature review, the component of vehicle maintenance management practice that will be identified their relationship and effect on operational performance. By categorizing these practices and relating these to operational performance, the conceptual framework is proposed as the following figure.

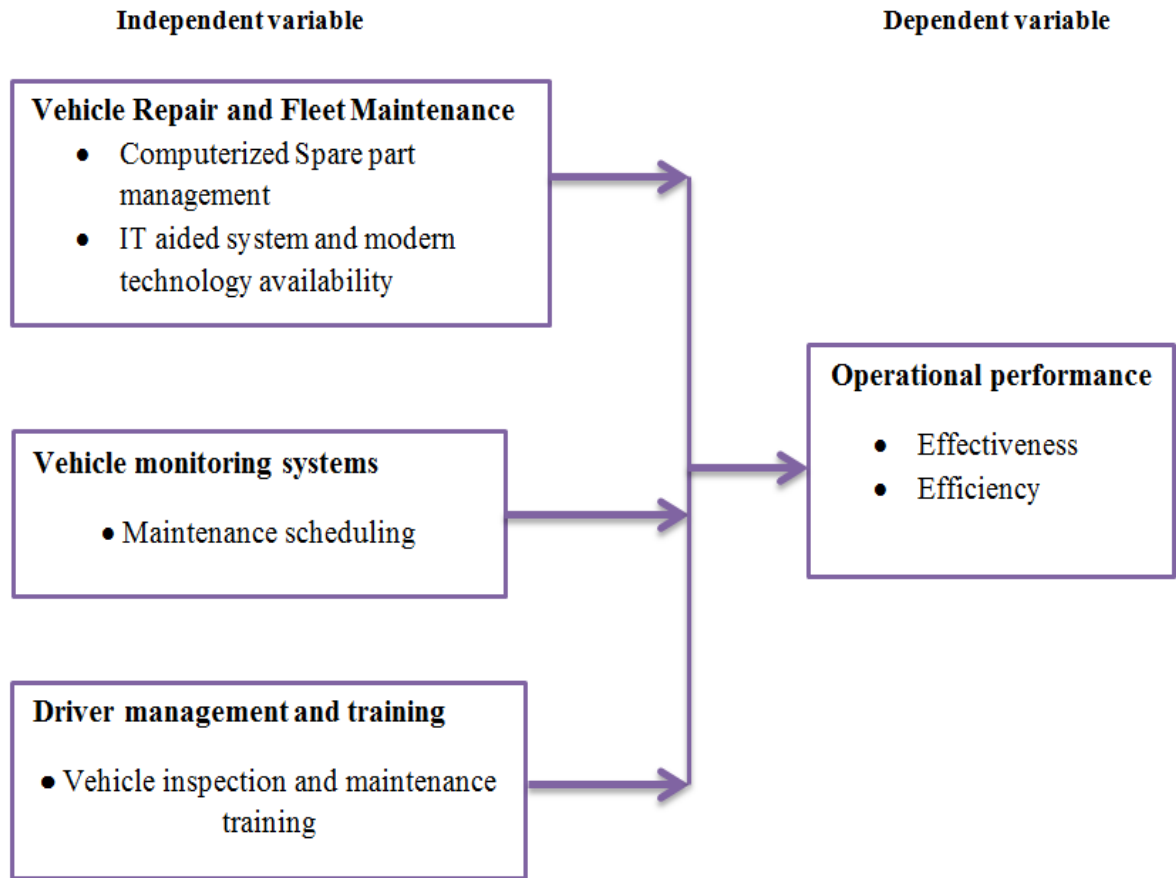


Figure 2.1 Conceptual framework

Source: adapted from Gitahi and Ogollah (2014)

CHAPTER THREE

METHODOLOGY

3.1. Introduction

This chapter describes the research methodologies that are used in addressing the research objective. Specifically, the chapter constitutes the research approach the research design, population of the study, the sample design, data collection instruments and the data analysis technique.

3.2. Description of the study area

ESLSE has a multitude of vessels, heavy-duty trucks, sea and dry port facilities to facilitate the import and export activity of the enterprise. In addition, it uses its own trucks to achieve its activities and for that of heavy-duty trucks, there are branches of maintenance mainly at Kality and Mile. The heavy-trucks fleet management department and vehicle maintenance department is found at kality branch, which manage the overall company's vehicle fleet which include a range of functions, such as vehicle financing, vehicle maintenance, vehicle trucking, fuel controlling etc.

Therefore, the basic objective of this study is to examine and assess how employee perceived the effect of vehicle maintenance management practices on operational performance of the enterprise. To meet this objective, the following research methodology will be used in the course of conducting the research.

3.3. Research Approach

Bryman, D In this research, the researcher used both qualitative and quantitative research approach. According to. (2004:266) qualitative research method, that usually emphasizes words rather than quantification in the collection and analysis of data. Among the two designs, this study prefers to depend more on the quantitative one and to some extent will be used Qualitative by preparing open ended questions since it can be used to gather qualitative data. Accordingly, there was an assessment of the effect of vehicle maintenance management practices.

3.4. Research Design

The research was designed in both descriptive and explanatory features of study. Since descriptive study allows the researcher to describe those data and helps to know the event that was taken place it is used whereas explanatory study to examine the relationships between variables with employing inferential statistics.

The study has adopted a descriptive research design, a scientific method which involves observing and describing the behavior of a subject without influencing it in any way (Saunders, Lewis, & Thorn hill, 2007). Descriptive research studies are those studies, which are concerned with describing the characteristics of a particular individual, or of a group. When the focus is on cause-effect relationships, the study can be explanatory explaining which causes produce which effects (Yin, 1994). Our concern in casual analysis is how one variable affects, or is responsible for changes in another variable. The stricter interpretation of causation is that some external factor produces a change in the dependent variable. Explanatory research which is grounded in theory is another research purpose type, and the theory is created to answer why and how questions. Explanatory studies attempts to explain the reasons for the phenomenon that the descriptive study only observed. In an explanatory study, the researcher uses theories or hypotheses to represent the forces that caused a certain phenomenon to occur. (Yin, 1994). The independent variable refers to the antecedent phenomenon, while the dependent variable relates to the consequent phenomenon. Therefore, to explain the effect and relationships between the independent variables and the dependent variable explanatory research studies was employed.

3.5. Target Population and Sampling Technique

The total numbers of ESLSE's workers were around 4000 who are working in the head office of ESLSE found in Addis Ababa, in seven dry ports of ESLSE branch offices of ESLSE within our country and Djibouti port branch office of ESLSE. Total number of workers in Kality is 816 and out of this 212 are workers in the vehicle maintenance department and fleet administration.

Therefore, the data was collected from workers from ESLSE Kality branch in Addis Ababa since those have a direct relation with vehicle management and maintenance.so that, using Purposive sampling technique. The target population of this selected branch is 212.The study

used the following sample size formula to determine the sample size of the population. It is determining by using the formula that was developed by Taro Yamane (1967). It was as follows:

$$n = \frac{N}{1 + N(e)^2}$$

Where n= Sample Size

N= Population Size

e=the error of 7 percentage size

$$n = \frac{212}{1 + 212(0.07)^2}$$

$$n = 104$$

So that according to the sampling result 104 questionnaires has been distributed to workers which have a direct relation.

3.6. Data sources and types

Both primary data were used in the study. The primary data was ordinal (categorical) type to help giving score on the bases of respondents' opinions. Once the aim of the study was to identify the critical factors or practices by evaluation the score obtained, ordinal (categorical) data type found to be the right one to identify those variables based on the importance of the practices. So that questionnaires was distributed for sample employees for the source of primary data.

3.7. Data Collection Methods

The data collection method applied for primary data was questionnaire. The questionnaire was organized in Likert scale questions prepared in a close-ended (fixed alternative) form of questions to avoid waste of time that may be spent for editing. A closed ended form helps in standardizing alternative responses helped to compare the answers by facilitates coding, tabulating, and ultimately interpreting the data. The questioners were developed by self-administered ways to identify the relationships of factors between dependent and independent variables. A funnel technique of developing questionnaires was taken in to a

consideration starting respondents to answer general questions before go to specific questions in order to obtain unbiased responses.

3.8. Data Analysis Method

The data (both primary and secondary) was analyzed. The primary data is ordinal in nature that needs examining of relationship between variables for ranking purpose, as a result, the test applied was a non-parametric. The data was analyzed after getting response for the questionnaires and coding before it record. All available clear response was recorded to analyze using SPSS. The secondary data, on the other hand, was analyzed using tables and figures from reports of the enterprise with regards to each factor being tested. In the study, a multiple regression analysis was conducted to test the influence of each variables with respect to operational performance particularly.

The research has used statistical package for social sciences (SPSS V 26.0) compute the measurements of a multiple regressions. In order to come up with a better result, both descriptive and explanatory statistics was used to describe a set of data in terms of its frequency of occurrence, its central tendency, regression analysis, correlation analysis and reliability test were explained through employing inferential statistics.

3.9. Validity and Reliability

The most common technique used to assess the scales reliability and stability is use of the Cronbach Alpha Statistics, which was employed to measure the reliability of the research.

Accordingly, validity of research tool has three components. The first is construct validity, which deals with the consistency of the questions with the responses, which was intended by the researcher. This validity is assured by structuring the questionnaire according to the specific objectives. The second form of validity is content validity, which was assured using close-ended questions to avoid irrelevant answers. To ensure internal validity of the questionnaire, the researcher also gave the draft questionnaire to the advisor for review and recommendations, for the final questionnaire. Construct validity is assured by rearranging the questions according the comments or opinions of the respondents in order to keep the flow of questions. Chronbach Alpha should be over 0.70 to produce a reliable scale and any scale with Chronbach Alpha less than this standard should be eliminated.

Table 3.1 Reliability

		N	%
Cases	Valid	101	100.0
	Excluded ^a	0	.0
	Total	101	100.0

a. List wise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
0.714	24

Table 3.2 Reliability coefficient of each variables

Reliability Statistics for each variables		
	Cronbach's Alpha	N of Items
Vehicle maintenance and fleet repair	.563	15
Vehicle monitoring system	.474	13
Driver management and training	.635	14

According to (Taber, 2016) Cronbach's Alpha (0.45-0.98) is acceptable.

3.10. Ethical Considerations

It is necessary to follow ethical measures for the research as guidelines. Ethical considerations in research are critical. Ethics are the norms or standards for conduct that distinguish between right and wrong. They help to determine the difference between acceptable and unacceptable behaviors. In addition, the questions were simple and clear to avoid any misunderstanding and avoid ambiguity, as well as sensitivity to the pieces of information the informants was provide to the researcher.

Therefore, a formal letter was written from Addis Ababa University, School of Commerce, to Ethiopian shipping and logistics service enterprise kality branch. The data collection only was started after getting consent/permission from the enterprise mentioned above. Any type of ambiguous information, as well as representation of primary data findings in a biased way was avoided.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1. Introduction

In this chapter, the collected data from Managers, Maintenance workers of ESLSE at Kality branches are presented, interpreted and analyzed in order to realize the ultimate objective of the study. Accordingly, demographic profile of the respondent, descriptive analysis and regression analysis on the effect of vehicle maintenance management practices on operational performance of ESLSE is discussed. In order to address the research questions, 104 questionnaires were prepared and distributed to employees, out of these questionnaires 101 were filled and returned, the rest 3 questionnaires were unreturned, and no questionnaires were discarded due to missing data.

4.2. Response Rate and Demographic data

104 questionnaires were distributed to employees that were targeted and samples selected and 101 (97.1%) were obtained and collected. This response rate is considered very good to enable the determination of the phenomenon that exists as it is in line with Mugenda, O. & Mugenda, A. (2003) assertion/statement. They state that the response rate of above 75% is recommended for the generalization of the study findings.

Table 4.1 Overall Response Rate

Description	NUMBER	PERCENT
Number of questionnaires distributed	104	100
Number of questionnaires Collected	101	97.1
Number of total usable questionnaires	101	97.1

Respondents were asked to report their gender, age, educational status, working experience, and their income status. A percentage and frequency characteristic of the respondents is presented in the following table.

Table 4.2 Demographic Information of respondents

Gender		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	4	4.0	4.0	4.0
	Male	97	96.0	96.0	100.0
	Total	101	100.0	100.0	

Age		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	26-35	56	55.4	55.4	55.4
	36-45	26	25.7	25.7	81.2
	≥46	19	18.8	18.8	100.0
	Total	101	100.0	100.0	
Working experience					
Valid	Less than 2	1	1.0	1.0	1.0
	2-5	37	36.6	36.6	37.6
	6-9	16	15.8	15.8	53.5
	More than 9	47	46.5	46.5	100.0
	Total	101	100.0	100.0	
Educational Qualification		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below Degree	16	15.8	15.8	15.8
	First Degree	82	81.2	81.2	97.0
	Master's Degree	3	3.0	3.0	100.0
	Total	101	100.0	100.0	

Table 4.2 shows that there were 97(96%) male respondents and 4(4%) female respondents. Furthermore, most of the respondents' age is ranged between 26-35 years old (55.4%) and 36-45 years old (25.7%). This indicates that most of the respondents are relatively adult. Around 18.8% of the respondents are between greater or equal to 46 years. In relation to their qualification level, as table 4.2 illustrates 81.2% of the respondents were degree holders, 15.8% of them were below degree and the rest 3% of them were master's degree holders.

Table.4.2 also shows that, there were four categories of work experience; less than 2, 2 to 5, 6 to 9 and greater than 9 years. Accordingly, the first category accounts 1% of the respondents; the second group who had 2 to 5 years of experience was 36.6% of the respondents; the third group who had 6 to 9 years of experience was 15.8% of the respondents. The rest 46.5% of the respondents had more 9 years of work experience.

4.3. Descriptive Analysis

This section presents the descriptive statistics in relation to the study namely; level of implementation of transport management practices, logistics performances and challenges of transport management practices.

Based on Best (1977:174), A calculated mean value that ranges from 1 to 1.80 implies strong disagreement, a mean range from 1.81 to 2.6, from 2.61 to 3.4, from 3.41 to 4.2 and from 4.21 to 5.00 represented respondents' perceptions of somewhat disagree, neutral, somewhat agree and strongly agree respectively. The 0.8 served as a boundary for each elements of the measurement in the questionnaire.

4.3.1. Implementation level of vehicle maintenance management Practices

The study tried to determine the extent of implementations of vehicle maintenance management practices. Specifically, the study investigated four main practices namely; Vehicle Repair and Fleet Maintenance Practices, Vehicles monitoring systems Practices and Driver Management with Training Practices.

All of the variables were measured using a five point Likert scale, where 1 stands for Strongly Disagree and 5 stands of Strongly Agree. Therefore, the interpretation made using the mean of each variable, in fact, the mean falls between the two ranges, hence if the mean approaches to 1 the interpretation would be the respondents didn't agree on the raised issue or variable and if it approaches to 5 the reverse would be true.

4.3.1.1. Measurement of effect of Vehicle Repair and Fleet Maintenance Practices

The mean and standard deviations were generated from SPSS and are as illustrated in Table below.

Table 4.3 Vehicles Repair and fleet maintenance Practices

Vehicles Repair and fleet maintenance Practices	N	Min.	Max.	Mean	Std. D
The enterprise has well-organized manual in replacing of parts of vehicle.	101	1.00	4.00	2.4455	.96411
The enterprise has computerized recording of history of vehicles.	101	1.00	4.00	1.9901	.96431
In my enterprise, parts of vehicles get inspection before failure occurs.	101	1.00	5.00	3.0990	1.33795
In my enterprise, There is a routine servicing of vehicles in the enterprise.	101	3.00	5.00	4.1089	.84736

In my enterprise, There is a computerized spare part management in the enterprise.	101	1.00	5.00	1.9010	.97473
There is an IT aided system and modern technology practices in the enterprise.	101	1.00	5.00	2.2574	.90170
Valid N (listwise)	101	1.33	4.66	2.6337	0.9984

Source: Survey spss output (2022)

The above table showed Vehicles Repair and fleet maintenance factors of vehicles maintenance management practices. The factor, which the respondents gave higher mean score, was the question state that, there is a routine servicing of vehicles in the enterprise, which has the mean score of 4.1089 and the other practice that states about parts of vehicles get inspection before failure occurs with mean value 3.09. The variables that tells if the enterprise has well-organized manual in replacing of parts of vehicle, computerized recording of history of vehicles and existence of computerized spare part management in the enterprise has the mean score of 2.44, 1.99 and 1.90, respectively, lays in disagree level as important determinants of mode choice factors in the case of Kality enterprise. On the other hand, existence of IT aided system and modern technology practices in the enterprise with 2.25 mean score which lays in disagree level.

Accordingly, the analysis shows that Vehicles Repair and fleet maintenance Practices had a means score of 2.6337, which almost the score of this variable falls in at neutral level. Moreover, computerized recording of history of vehicles and computerized spare part management is not there in the enterprise. Therefore, Vehicles Repair and fleet maintenance Practices are one of the expected variables that are assumed to affect operational performance of the enterprise. So that, if there is well prepared maintenance manual, history recording of frequency of parts with defects, computerized system to know working condition of changed parts and a link with maintenance shops, there will be improvement of vehicle to prevent damage on trip.

4.3.1.2. Measurement on effect of Vehicles monitoring systems Practices

The research also tried to look the effect of Vehicles monitoring systems Practices, and the responses were rated on a five point Likert scale indicating to what extent respondents agree to the statements, where: 1- Not at all, 2- To a little extent, 3- To a moderate extent, 4- To a

great extent and 5-To a very great extent. The mean and standard deviations were generated from SPSS and are as illustrated in table below.

Table 4.4 Vehicles monitoring systems Practices

Vehicles monitoring systems Practices	N	Min.	Max.	Mean	Std. D
The enterprise is using advanced vehicle monitoring system for vehicle maintenance management.	101	1.00	5.00	2.5446	.88910
The enterprise has scheduled maintenance with effective monitoring system of vehicles.	101	1.00	5.00	2.2772	.76314
ESLSE uses GPS vehicle monitoring system to minimize maintenance related delays.	101	1.00	5.00	2.1386	.82498
In my enterprise, Vehicle monitoring system has an importance to achieve operational performance in terms of minimizing idle time.	101	3.00	5.00	4.2178	.83191
Valid N (listwise)	101	1.50	5.00	2.79455	0.82728

Source: Survey spss output (2022)

The above table showed Vehicles monitoring systems factors of vehicles maintenance management practices. The statement, which the respondents gave higher mean score, was monitoring system importance to achieve operational performance in terms of minimizing idle time in the enterprise, which has the mean score of 4.2178 and the first practice that states about the using of advanced vehicle monitoring system for vehicle maintenance management with mean value 2.5446. On the other hand, availability of scheduled maintenance with effective monitoring system of vehicles and using of GPS vehicle monitoring system to minimize maintenance related delays has the mean score of 2.2772 and 2.1386, respectively, lays in disagree level as important determinants of mode choice factors in the case of Kality enterprise. Accordingly, the analysis shows that Vehicles monitoring systems Practices has a means score of 2.794, which almost the score of this variable falls in at neutral level. Therefore, Vehicles monitoring systems Practices are one of the expected variables that are assumed to have an effect on operational performance. Here alerting system for each vehicles can be applied for the help of monitoring.

4.3.1.3. *Measurement on effect of Driver Management with Training Practices*

The responses were rated on a five point Likert scale indicating to what extent respondents agree to the statements, where: 1- Not at all, 2- To a little extent, 3- To a moderate extent, 4- To a great extent and 5-To a very great extent. The mean and standard deviations were generated from SPSS and are as illustrated in table below.

Table 4.5 Driver Management with Training Practices

Driver Management with Training Practices	N	Min.	Max.	Mean	Std. D
In my enterprise, Driver Management with Training is essential to enhance the employee's skill, so then the operational performance.	101	3.00	5.00	4.4653	.60933
In the enterprise, there are trainings for drivers about vehicle maintenance.	101	1.00	3.00	1.8218	.65416
In ESLSE, The drivers' recognition system encouraged honest reporting.	101	1.00	5.00	3.2079	1.34400
ESLSE supports drivers for their wellbeing to create a reciprocal sense of obligation to meet the firm's goals.	101	3.00	5.00	4.1089	.84736
In the enterprise, drivers expend their best effort to meet the firm's objectives, thus leading to a higher level of firm performance.	101	1.00	5.00	3.2079	1.34400
Valid N (list wise)	101	1.80	4.60	3.36236	0.95977

Source: Survey spss output (2022)

The above table presented Driver Management with Training Practices of vehicles maintenance and management practices. The first statement, which the respondents gave higher mean score (4.4653), was essentiality of driver Management with Training to enhance the employee's skill, so then the operational performance in the enterprise. In addition, the other practice that states about supports of an enterprise for the drivers for their wellbeing to create a reciprocal sense of obligation to meet the firm's goals with mean value 4.1089.

On the other hand, The drivers' recognition system that mention an encouraged honest reporting and existence of drivers best effort to meet the firm's objectives, thus leading to a higher level of firm performance has the mean score of 3.2079, lays in neutral level as important determinants of mode choice factors in the case of Kality enterprise. Lastly,

availability of trainings for drivers about vehicle maintenance scores mean of 1.8218 which means there is almost no training is availability. Accordingly, the analysis shows that Driver Management with Training Practices has a means score of 3.36236, which almost the score of this variable falls in at neutral level. Therefore, Driver Management with Training Practices is one of the expected variables that are assumed to have an effect on operational performance. So that, there must be trainings considering new purchased vehicles since these vehicles are modern.

4.3.2. Measurement of operational performance

The responses were rated on a five point Likert scale indicating to what extent respondents agree to the statements, where: 1- Not at all, 2- To a little extent, 3- To a moderate extent, 4- To a great extent and 5-To a very great extent.

Table 4.6 Measurement of operational performance

Operation performance	N	Min.	Max.	Mean	Std. D
The enterprise is able to assess the performance in terms of travel times for just-in-time delivery strategies.	101	2.00	5.00	3.9703	.86551
In my enterprise, the number of trips in a movement cycle time is as expected time frame which is 3 trips per month.	101	1.00	5.00	2.3366	.85179
The enterprise has successful performance regarding transport activities such as timeliness and accuracy.	101	1.00	5.00	2.7228	.74992
The enterprise is achieving travel time strategy as customers demand their shipments be delivered as they require on the date needed.	101	1.00	5.00	3.0198	1.18305
Valid N (list wise)	101	1.25	5.00	3.01237	0.912568

Source: Survey spss output (2022)

The above table showed the agreement level of determinants of operational performance. The statement, which the respondents gave higher mean score, is ability of the enterprise to assess the performance. This ability in terms of travel times for just-in-time delivery strategies, which has the mean score of 3.9703 shows as it is on agree level. And the second statement that states about the number of trips in a movement cycle time is as expected time frame which is 3 trips per month has with mean value 2.3366 which means it is on disagree level.

The availability of successful performance regarding transport activities such as timeliness and accuracy and achievement of travel time strategy as customers demand their shipments be delivered as they require on the date needed has the mean score of 2.7228 and 3.0198, respectively, lays in neutral level as important determinants of mode choice factors in the case of Kality enterprise. Accordingly, the analysis shows that operational performance of the enterprise has a means score of 3.012, which almost the score of this variable falls in at neutral level. Therefore, all the listed statements can measure the performance and mostly the number of trips. As the table shows the number of trips in a movement cycle time is not as expected time frame which is 3 trips per month. And the enterprise's performance regarding transport activities such as timeliness and accuracy is seen as it is an average or not said to be efficient so that the enterprise should done improvement on keeping the time as per customer expectation.

As shown by the above table in terms of these measuring statements, the effectiveness and efficiency in operational performance scores means of 3.9703, 2.3366, 2.7228 and 3.0198. This shows that overall performance at Kality branch of ESLSE is an average mean of 3.012 and standard deviation of 0.912 was obtained due to low performance of the above listed variables.

4.4. Relationship between Vehicle Maintenance Management Practices together and Operational Performance at Kality branch(ESLSE)

This section consists of correlation and regression analysis. The section was meant to achieve both general and specific objectives in establishing the relationship that exists between the study variables.

4.4.1. Correlation analysis

This is done to achieve the study specific objectives, which were to establish the effect of vehicle maintenance management practices determinant namely; Vehicle Repair and Fleet Maintenance Practices, Vehicles monitoring systems Practices and Driver Management with Training Practices on operational performance at Kality branch. The findings are presented in Table below.

Table 4.7 Correlation Analysis

Variables Vs Correlation		OP	VM	DMT	VRFM
OP	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	101	101		
VM	Pearson Correlation	.393**	1		
	Sig. (2-tailed)	.000			
	N	101	101		
DMT	Pearson Correlation	.351**	.171	1	
	Sig. (2-tailed)	.000	.087		
	N	101	101	101	
VRFM	Pearson Correlation	.547**	.344**	.344**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	101	101	101	101

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

Source: Survey spss output (2022)

As the result, all variables there has genuine relation between each other and with operational performance. These are used to determine the how effective the enterprise is in accomplishing its tasks and operations. Additionally, ratios may also be incorporated in the organization in controlling the financial affairs.

As shown by the above table, Vehicle Repair and Fleet Maintenance Practices (VRFM) has a positive and significance effect on operational performance with a correlation coefficients of .547** ($r=0.547$) and significance is 0.000. This implies that increase of Vehicle Repair and Fleet Maintenance Practices will greatly improve operational performance. This matches with (Borirug et al, 2009), that states that an automated maintenance operation fleet management tracks the vehicles and their parts plus planned maintenance of the vehicles. This makes the tasks of repairing and maintaining fleets easier. And also, T.Ambaye (2019) who investigated the effect of fleet management practices on operational performance of the organization. He found out that the organizations that had well developed Vehicle repair and fleet Maintenance Practices had better performance compare to others .Therefore investing in vehicle maintenance management practices will result in positive outcomes. The study established that vehicle monitoring (VM) under vehicle maintenance management practices

has a positive effect on operational performance with a correlation coefficients of ($r=.393^{**}$) and significance is 0.000.

This significance tells that there is genuine relationship between the two. This implies that increase of vehicle monitoring practices will greatly improve operational performance at kality branch of the enterprise.

The findings revealed that driver management and training practices (DMT) has a positive and significance effect on operational performance with a correlation and significance of ($r=.351^{**}$), 0.000 respectively. This clearly indicates that when the effect of driver management and training practices increases, the operational performance also increases simultaneously.

To sum up; as we have seen from the above correlation matrix the independent variables has a direct effect the dependent variable which is operational performance due to their strong relation, the scores of low logistics performance is due to their low performance of each variables. This implies that when the increasing of one practice determinant directly increasing the performance of operation.

4.4.2. Assumptions of Multiple Regression Mode Analysis

When running a Multiple Regression, there are several assumptions that we need to check our data meet, in order for our analysis to be reliable and valid. As clearly explained by statistician report on regression analysis (2007), it is important to make sure that any violations of the assumptions when writing up the results of the multiple regression analysis should be fulfill the following six main assumptions. In this case:

1. The relationship between the Independent and Dependent variable is linear.
2. There is no Multicollinearity in your data. Analysis of co linearity statistics show this assumption has been met, as VIF scores is below 10, & tolerance scores above 0.2.
3. The values of the residuals are independent. The Durbin-Watson statistic showed that obtained value was below 2 which is positive auto-correlation.
4. The variance of the residuals is constant.
5. The values of the residuals are normally distributed.
6. There are no influential cases biasing your model.

4.4.3. Tests on Multicollinearity

If more than two variables are involved it is often called Multicollinearity, although the two terms are often used interchangeably. The primary concern is that as the degree of

Multicollinearity increases, the coefficient estimates become unstable and the standard errors for the coefficients can get wildly inflated. As clearly stated by Black, W.C. (1995), the term collinearity implies that two variables are linear combinations of one another. In this section, we will explore some SPSS commands that help to detect Multicollinearity.

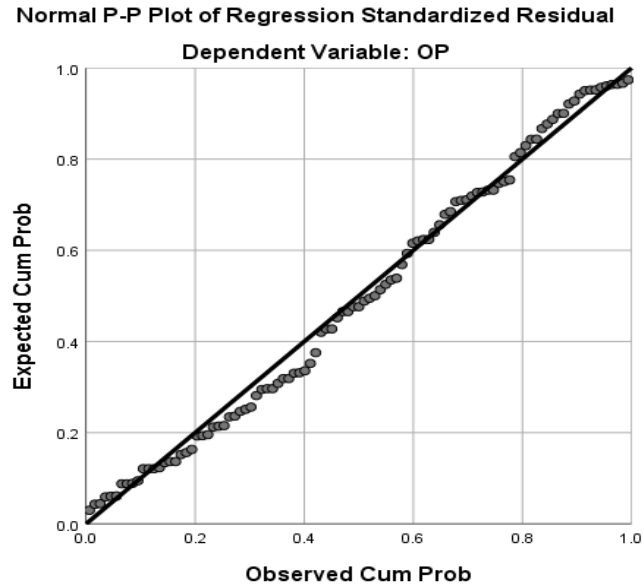


Figure 4.4.1 Normality test of regression

As the above figure shows, a diagonal line and bunch of circles, the circles are following the normality line, which is the diagonal. So that it indicates, there is normal regression.

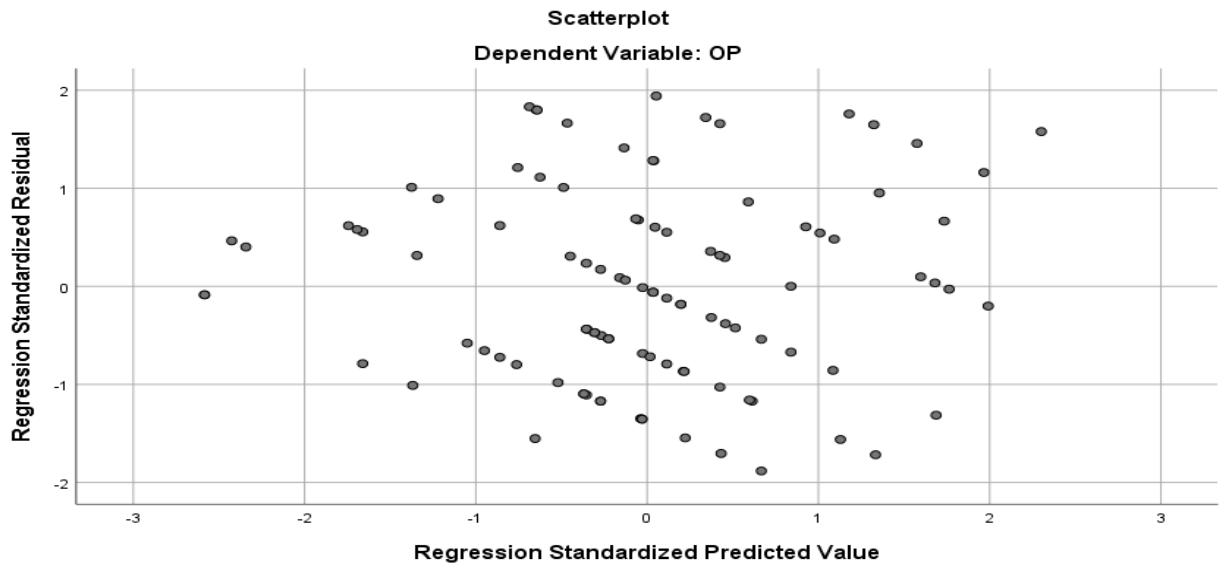


Figure 4.4.2 Scatter plot test

Based on the figure above, the data looks like a shot out of a shotgun, there are points equally distributed above and below zero on x-axis & to the left & right of zero on y-axis.

The tolerance is an indication of the percent of variance in the predictor that cannot be accounted for by the other predictors. This means that very small values indicate that a predictor is redundant, which means that values less than 0.10 are worrisome. The VIF, which stands for variance inflation factor, is (1/tolerance) and as a rule of thumb, a variable whose VIF values is greater than 10 are problematic (Black, W.C.1995). so that, the following two points should be under consideration for the interpretation of the out puts.

1. If the VIF value lies between 1-10, then there is no Multicollinearity.
2. If the VIF 10, then there is Multicollinearity.

Table 4.8 Tests on Multicollinearity

Model		Coefficients ^a					Collinearity Statistics	
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Tolerance	VIF
		B	Std. Error	Beta				
1	(Constant)	.844	.307		2.750	.007		
	Vehicle monitoring practices	.249	.096	.222	2.586	.011	.879	1.138
	Driver Management Tracking practices	.117	.059	.171	1.990	.049	.878	1.139
	Vehicle Repair and Fleet Maintenance	.410	.090	.412	4.579	.000	.798	1.253

a. Dependent Variable: OP(Operational performance)

Source: Survey spss output (2022)

As the above table shows on the coefficients output - Collinearity Statistics, obtained VIF value of less than 4 in all variables, meaning that the VIF value obtained is between 1to 10 ,it can be conclude that there is no Multicollinearity symptoms.

4.4.4. Regression Analysis

The regression analysis was used to establish the relationship that exists between the research variables (dependent and independent). The independent variables were determinants of vehicle maintenance management practices, while the dependent variable was operational

performance. This regression analysis was to know by how much the independent variable explains the dependent variable.

Table 4.9 Regression Analysis

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.610 ^a	.373	.353	.37222	.373	19.206	3	97	.000	1.327

a. Predictors: (Constant), VRFM, VM, DMT

b. Dependent Variable: OP

Source: Survey spss output (2022)

The Durbin-Watson statistic showed that obtained value was below 2 which is positive auto-correlation.

As indicated in the above table the coefficient of determinant R square is 0.373 and R is .610^a. The coefficient of determinant R square indicates that 37.3% of the variation in the operation performance is explained by determinants of vehicle maintenance management practices determinant namely; Vehicle Repair and Fleet Maintenance Practices, Vehicles monitoring systems Practices and Driver Management with Training Practices. Thus, 62.7% of the variations in performance are accounted for by other factors/practices not presented in the model.

Table 4.10 Analytical model

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	VIF
		B	Std. Error	Beta			
1	(Constant)	.844	.307		2.750	.007	
	Vehicle monitoring system practices	.249	.096	.222	2.586	.011	1.138
	Driver Management and Training practices	.117	.059	.171	1.990	.049	1.139
	Vehicle Repair and Fleet Maintenance practices	.410	.090	.412	4.579	.000	1.253

Source: Survey spss output (2022)

From the analytical model developed show that Vehicle monitoring practices ($\beta_1 = 0.249$, $p = 0.011$), Driver Management Tracking practices ($\beta_2 = 0.117$, $p = 0.049$) and Vehicle Repair and Fleet Maintenance Practices ($\beta_3 = 0.410$, $p = 0.00$) have a positive relation and significance on operational performance. Findings in the above table shows that the major significance variables are Vehicle Repair and Fleet Maintenance practices ($P = .000$), Vehicle monitoring practices ($p = 0.011$) while the least insignificance variable is Driver Management Tracking practices ($p = 0.49$) respectively. This shows that increases in the dimensions of vehicle maintenance management practices determinants will cause increased operational performance. Except a variable of Driver Management and Training practices others variables are slightly significant in the operational performance with (37.3%).

The above table gives the results for the regression coefficient for the multiple linear equation; ($Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$) & by supplying the coefficients it becomes:

$$Y = 0.844 + 0.249X_1 + 0.117X_2 + 0.41X_3$$

where; Y -Operational performance,
 X1 -Vehicle monitoring practices,
 X2 -Driver Management and Training practices,
 X3 -Vehicle Repair and Fleet Maintenance practices

According to the regression equation established, holding all independent factors constant, then operational performance will be 0.844 units. Holding all other independent variables constant, a unit increase in Vehicle monitoring practices will lead to a 0.249 increase in operational performance.

A unit change in Driver Management and Training practices will lead to a 0.117 unit improvement in operational performance; a unit increase in Vehicle Repair and Fleet Maintenance practices will lead to a 0.41 (41%) increase in operational performance.

However, at 5% level of significance and 95% level of confidence all practices have a significance influence on the operational performance with p-values of $p = 0.011$, $p = 0.049$, $p = 0.00$ respectively.

Since open-ended questions can be used to gather qualitative data. The following recommendations are collected from the open-ended questions of questionnaire regarding improvements of the vehicle maintenance management of ESLSE.

- ✚ Having employees training.
- ✚ Fulfilling man power in open vacant.
- ✚ Purchasing original spare parts.
- ✚ Implementing modern technology.
- ✚ Fulfilling garage tools to have defect free maintenance.
- ✚ Purchasing modern vehicle.
- ✚ There must be well-computerized system of maintenance.
- ✚ There must be inbound and outbound inspection.

Beside the above recommendation from employees, from reports of the enterprise the table below shows that there are root problems in the branch that are obstacles to the operation. As we can see below some of the practices (independent variables determinants) are existing factors.

Actions to be taken	purpose	Implementing ways
Improve maintenance system using ECRS	To reduce garage downtime	<ul style="list-style-type: none"> • Prepare process flow • Identify value added and non-value added activity • By making quality maintenance • Use equipment to support maintenance (to Simplify)
Improve machine shop productivity	To solve spare part problem	<ul style="list-style-type: none"> • Through work flow analysis • Machine automation • By giving instruction To operator to make faster • Networking office to reduce muda of motion .
Implement patrol monitoring system	To easily supervise and control trucks.	<ul style="list-style-type: none"> • Through strong communication between driver and operation with Daily Driver report. • By improving communication between branch and Head office .
Communication between dry port	To reduce operational downtime	<ul style="list-style-type: none"> • Collect accurate information from Djibouti operation. • Identify the destination of each cargo • Contact with dry port personnel

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1. Introduction

This chapter presents the summary of the study findings, conclusion and recommendations drawn from the study of findings. The chapter is based on the study objectives, which were to analyze vehicle maintenance management practices among operational performances at Ethiopian shipping and logistics service enterprise and to determine the relationship between these practices and operational performance.

5.2. Summary

ESLSE is one of the enterprises working in logistics and under its freight forwarding sector the enterprise is trying to achieve its aim by having new brand heavy vehicles. Hence, to achieve the aim of the enterprise efficiently and effectively, it has to a well-organized vehicle maintenance management for its fleet efficiency system in order to enhance profitability and competitiveness. The research was anticipated to analyze the effect of vehicle maintenance management practices on operational performance of ESLSE. Three main variables were used to evaluate the impact on operational performance, which includes; vehicle repair and fleet maintenance, vehicles monitoring system and driver management and training. In order to achieve these objectives, data were collected from the employees of the enterprise and processed in quantitative approach of descriptive approach and also used regression analysis. The data was collected using questionnaire and analyzed using descriptive and inferential statics of explanatory analysis.

5.2.1. Relationship between vehicle maintenance management practices & operational performance of ESLSE

The study required to determine the relationship of vehicle maintenance management practices and operational performance at ESLSE. To achieve this, both correlation and regression analysis were employed.

- ✓ The correlation analysis found out that based on the positive correlation obtained the variables had a positive effect on the operational performance.
- ✓ Hence an increase in these practices would result in improved returns. In addition, all the variables significance at 95% confidence level as their p-value were less than 0.5. This shows that at any particular time changes in vehicle maintenance management practices would result in changes in operational performance positively.
- ✓ The regression analysis further showed that 37.3 % of the variation in the performance may be explained by the determined practices in the study.
- ✓ From the model coefficients obtained, all the variables had positive coefficients. This thus confirms that determinants of vehicle maintenance management practices have a positive and significant effect of on operational performance.

5.2.2. Implementation level of vehicle maintenance management Practices

The study sought to determine the extent of implementation the vehicle maintenance management practices determinants in operational performance.

Specifically, the study investigated three main practices namely; Vehicle Repair and Fleet Maintenance Practices, Vehicles monitoring systems Practices and Driver Management with Training Practices.

- On Vehicles Repair and fleet maintenance Practices, all practices were established to be implementing to a small extent which scores less than 2.633 on average and standard deviations was 0.99.
- Implementation of vehicle monitoring practices with an average mean of 2.794 and standard deviation of 0.827 were obtained. This implies that a moderate extent of implementation which may be lack of availability of scheduled maintenance with effective monitoring system of vehicles and unavailability of GPS vehicle monitoring system.
- Driver Management with Training Practices also has a small extent of implementation obtained as the mean average was 3.362 and standard deviation of 0.959.

This shows that Driver Management with Training Practices and Vehicles Repair and fleet maintenance Practices are not being implemented well than vehicle monitoring practices; Thus findings therefore reveal that the implemented practices of vehicle maintenance management determinants in operational performance were scores moderate.

5.3. Conclusion

Under this study, the major determining variables of operational performance identified were vehicle maintenance management practices based on the response of employees which composed of three dimensions; vehicle repair and fleet maintenance practices, vehicle monitoring system practices, driver management and training. Four research questions were developed and addressed in this research. As per the regression equation established, holding all independent factors constant, then operational performance will be 0.844 units. Holding all other independent variables constant, a unit increase in Vehicle monitoring practices will lead to a 0.249 increase in operational performance; a unit change in Driver Management Tracking practices will lead to a 0.117 unit improvement in operational performance; a unit increase in vehicle repair and fleet maintenance practices will lead to a 0.41(41%) increase in operational performance. However, at 5% level of significance and 95% level of confidence all practices have a significance influence on the operational performance with p-values of $p= 0.011$, $p= 0.049$, $p=0.00$ respectively. The results further infers that of all the predictors considered in this study vehicle repair and fleet maintenance contributes the most to the operational performance followed by Vehicle monitoring as implicated by their larger coefficients.

5.4. Recommendations

Based on the above results and conclusions drawn above; some recommendation are proposed as a means of improving the problems found.

- Based on the first objective on vehicle repair and fleet maintenance, the enterprise have to use computerized spare parts management for stock balance management and interchanging a part with a technically more advanced part in order to make the equipment perform better. In addition, there must be link with computer system with

each available maintenance shops to simplify work order distribution and further for minimizing time taken of this distribution.

- Based on the objective on vehicle monitoring system, there should be effective use the GPS vehicle monitoring system to achieve maintenance management in terms of keeping the schedule of maintenance to be done on time since disordered maintenance will damage the vehicle and decrease the performance of the vehicle so then shorten its lifetime.
- Based on the last objective on drivers' management and training, the fleet managers should take careful actions on ensuring that drivers understand that they are responsible and accountable for their actions, improving driver recruitment procedures, educating and coaching drivers about vehicle maintenance and visual inspections.
- Further, having driver forums, encouraging honest reporting, and the enterprise have to motivate drivers because motivation and reward plays a significant role for any organizational culture.

The following recommendations are collected from the part three of questionnaire regarding improvements of the vehicle maintenance management of ESLSE.

- ✚ Having employees training.
- ✚ Fulfilling man power in open vacant.
- ✚ Purchasing original spare parts.
- ✚ Implementing modern technology.
- ✚ Fulfilling garage tools to have defect free maintenance.
- ✚ Purchasing modern vehicle.
- ✚ There must be well-computerized system of maintenance.
- ✚ There must be inbound and outbound inspection.

5.5. Suggestion for Further Study

The vehicle maintenance management practices may have other variables which can affect the operational performance of the enterprise. Therefore, including other variables and performing the research will give a better result since this research focused only in three variables; Other emerging practices like workers management with employee skill and training. And also inventory practices and other practices and Performance Metrics for the Maintenance Function should be investigated to know the effect of these variables on operational performance at the kality branch of ESLSE. Finally, the researcher strongly recommend other researchers to conduct further investigation on what models best describe vehicle maintenance management factors on operational performance taking measurable indicators in form of Key Performance Indicators (KPI) other than the fleet efficiency.

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Appendix-1

ADDIS ABABA UNIVERSITY
COLLEGE OF BUSINESS AND ECONOMICS
DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT

Questionnaires to be filled by employees of Ethiopian Shipping & Logistics Service Enterprise.

Dear Respondents:

I am conducting a thesis entitled “the effect of vehicle maintenance management practices on operational performance: a case of Ethiopian shipping and logistics service enterprise (Addis Ababa, Ethiopia)” for partial fulfillment of master of art degree in logistics and supply chain management at AAU.

This questionnaire has been designed to seek information for purely academic purposes and hence would not affect any one in any case and the administered questionnaire may take about 15-20 minutes. The information collected through the questionnaire is kept confidential and only used for academic purposes, and thereby, to come up with some workable solutions to overcome the known challenges and difficulties related to vehicle maintenance management practices and the effect of these practices on operation performance of the company. To this end, the outcome of this study will highly depend upon your response. Therefore, you are kindly requested to fill the questionnaire as per the instruction, carefully and responsibly.

General Directions

- ✓ You are not required to write your name.
- ✓ Respond to all close-ended question items by putting “√” mark in the boxes.
- ✓ For any clarification on this questionnaire, Please contact me on 0920-60-44-12 or abezmech@gmail.com (AbebeZemelak).

Thank you for your cooperation.

Respects!!!

Part one: General information/ Personnel data

1. What is your Age?

18-25 26-35 36-45 More than 45

2. What is your gender?

Male Female

3. How long you have been working in ESLSE?

Less than 2 Year 2-5 Years
 6-9 years More than 9 years

4. Marital Status

Married Single Separated

5. Educational qualification

Below Degree First Degree Master's Degree
 Above Master's Degree If any, _____

Part two: questions related with vehicle maintenance management that has effect on operational performance. Questionnaire (Likert Scale)

Note: 1= Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=strongly agree

1. Indicate your level of agreement

No.	Vehicle Repair and Fleet Maintenance	1	2	3	4	5
1	The enterprise has well organized manual in replacing of parts of vehicle.					
2	The enterprise has computerized recording of history of vehicles.					
3	In my enterprise, parts of vehicles get inspection before failure occurs.					
4	In my enterprise, There is a routine servicing of vehicles in the enterprise.					
5	In my enterprise, There is a computerized spare part management in the enterprise.					

6	There is an IT aided system and modern technology practices in the enterprise.					
No.	Vehicle Monitoring Systems	1	2	3	4	5
7	The enterprise is using advanced vehicle monitoring system for vehicle maintenance management.					
8	The enterprise has scheduled maintenance with effective monitoring system of vehicles.					
9	ESLSE uses GPS vehicle monitoring system to minimize maintenance related delays.					
10	In my enterprise, Vehicle monitoring system has an importance to achieve operational performance in terms of minimizing idle time.					
No.	Driver Management and Training	1	2	3	4	5
11	In my enterprise, Driver Management with Training is essential to enhance the employee's skill, so then the operational performance.					
12	In the enterprise, there are trainings for drivers about vehicle maintenance.					
13	In ESLSE, The drivers' recognition system encouraged honest reporting.					
14	ESLSE supports drivers for their wellbeing to create a reciprocal sense of obligation to meet the firm's goals.					
15	In the enterprise, drivers expend their best effort to meet the firm's objectives, thus leading to a higher level of firm performance.					
No.	Operational performance	1	2	3	4	5
16	The enterprise is able to assess the performance in terms of travel times for just-in-time delivery strategies.					
17	In my enterprise, the number of trips in a movement cycle time is as expected time frame which is 3 trips per month.					
18	The enterprise has successful performance regarding transport activities such as timeliness and accuracy.					

19	The enterprise is achieving travel time strategy as customers demand their shipments be delivered as they require on the date needed.					
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Part three

This section questionnaire relates to your level of awareness and knowledge regarding to the vehicle maintenance management for the logistics service performance of ESLSE. Put your answers in the space provided.

1. Do you believe efficient vehicle maintenance management contributes to operational performance growth?

Yes/ No

If your answer is Yes/No explain it why

2. What are your recommendations regarding improvements of the vehicle maintenance management of ESLSE?
