The Effect of Fleet Management Practices on Logistics Performance: The Case of Defense Joint Logistics Main Department Transport Department.

By

Zelalem Getahun

Id/No GSE/2190/12

A Thesis Submitted to Addis Ababa University School of Commerce Department of Logistics and Supply Chain Management in Partial Fulfillment of the Requirements for the Degree of Master of Arts in Logistics and Supply Chain Management.

Advisor:

Busha Temesgen (Ph.D)

June/ 2022

Addis Ababa, Ethiopia.

Addis Ababa University School of Commerce Department of Logistics and Supply Chain Management.

The Effect of Fleet Management Practices on Logistics Performance: The Case of Defense Joint Logistics Main Department Transport Department.

By:

Zelalem Getahun

Approved by a Board of Examiners and Advisor:

Busha Temesgen (Ph.D)	----------	----------
Advisor	Signature	Date
Tariku Jebena (Ph.D)	----------	----------
Examiner-1	Signature	Date
Nakachew Bashu (Ph.D)	----------	----------
Examiner-2	Signature	Date

ACKNOWLEDGMENT

First, I would like to thank everyone who gave me a valuable support on my research work and I am very glad to express my heart-felt thanks to Busha Temesgen (PhD.), for his comments and unreserved guidance during research work, for his constructive and crucial aiding how to prepare and correcting this research paper. I always remember him in giving me a detail feedback through email.

I would also extend my deepest appreciate to all my lovely families and my friends for their continuous support love and care during my study.

I would like to express my deepest appreciation to Defense Joint Logistics main department specially the Transport department employees for their contribution in stimulating suggestion and encouragement that helped me to coordinate my paper especially in giving the direction and facilities through the course of this thesis.

Finally, yet importantly, I wish to express my profound appreciation to MoND Procurement Directorate that has served to me internet, paper and printing services tirelessly gone through the paper and offered their constructive comments.

ABSTRACT

The purpose of the study was to describe the effect of fleet management practices on logistics performance in Defense Joint Logistics Main Department Transport Department (DJLMDTD) in Ethiopia.

The study adopted descriptive research design as well as both qualitative and quantitative research approach type used for interpreting the findings based on statistical data. Subsequently, Likert scale questionnaires were developed and distributed to 135 respondents who are the employees of DJLMDTD and semi structured interview also conducted for middle level and top-level managers. The researcher used stratified sampling technique. Descriptive statistics were calculated using Statistical package for the Social Science (SPSS) version 20.

Fleet management has become integral to the success of vehicle movement in institutions and must be a priority for organizations. Hence fleet management is a day-to-day activity in DJLMDTD which is not supported by mobile technology like GPS for some national security issues.

The study concluded that among fleet management practices vehicle repair and maintenance management have the largest effect on logistics performance, next is driver training management have effect on logistics performance, fuel management have negatively significant effect on logistics performance and vehicle schedule and routing have the least effect on logistics performance results mainly time delay, increase in operational cost and poor safety.

Based on the findings, the study recommended that the DJLMDTD is better to use a mobile technology like GPS which is useful in tracking the vehicles for a better efficiency and to adapt the fleet management practices effectively. There is also a need for regular driver training and apply the safety policies which are signed and enforced by upper management.

Key words: Vehicle repair management, Fuel management, Driver training and management, Vehicle schedule and routing and logistics performance.

DECLARATION

This thesis is a result of my independent research work on the topic entitled **"The Effect of Fleet Management Practices on Logistics Performance: The Case of Defense Joint Logistics Main Department Transport Department** in partial fulfillment of the requirements for the degree of master of arts in logistics and supply chain management, Addis Ababa University school of commerce. This work has not been presented for a degree to any other university. All references also duly acknowledged.

Zelalem Getahun

Signature----------

TABLE OF CONTENTS

Contents Page

LIST OF TABLES

Tables Page

LIST OF FIGURES

Figures Page

LIST OF ACRONYMS

- DJLMD- Defense Joint Logistics Main Department
- DJLMDTD- Defense Joint Logistics Main Department Transport Department
- EDF- Ethiopian Defense Forces
- GPS- Global Positioning system
- ICT- Information Communication System
- IT- Information Technology
- SMS-Short Message Services
- LOC- Lines of Communication
- VRM- Vehicle Repair Management
- FM- Fuel Management
- DM- Driver Training and Management
- MLS- Military Logistics Supply
- A- Agree
- SA- Strongly Agree
- D- Disagree
- SD- Strongly Disagree
- N- Neutral

CHAPTER ONE

1. INTRODUCTION

1.1. Background of the study

Transportation plays a major role in national defense. Governments have long recognized this role (Jhon J.Coyle, 2011). Fleet management embraces a variety of roles such as truck maintenance, automobile tracking, operator, and fuel management. Appropriate fleet management permits enterprises that trust on huge fleets to shape and harmonize their fleets to increase productivity, and also to decrease their transportation expenditures (UNHCR, 2018).

Vehicle fleets of large organizations, such as land-based military forces, significantly contribute to operational effectiveness across all battlefield operations systems. For example, in a military context and from the organization's point of view, one objective is the fleet's ability to negotiate diverse terrain quickly and under adverse environmental conditions. Another objective is to build the capacity to sustain prolonged and sizeable operations. Both these objectives depend heavily on the force's core transport capability. Designing and optimizing such a capability in a manner that meets operational requirements and, at the same time, is cost efficient therefore is of utmost importance to any military land force. The strategic significance of optimizing military vehicle fleets is matched by the complexity of the problem. Determining the optimal mix of a large heterogeneous transport fleet is computationally costly, mainly because the large-scale problem is hard to decompose and combinatorial complex. Inherent to the problem is the interaction between three NP-complete sub-problems; these are: scheduling, routing, and bin-packing. Producing an exact solution of any of these problems within an acceptable time period is very unlikely. To further complicate things, the optimization needs to be carried out in an environment which is constantly changing and is inherently uncertain. (Shafi, 2011)

The usage of various systems of information technology support in fleet management is the consequence of the development of information technologies that have achieved the necessary level at which they can be operatively applied in the transport companies. On the other hand, in the very transport companies the need has occurred for control and

development of various factors which influence the efficiency of using the fleet. (Rojic, 2007)

The problem of manmade and natural disaster is increasing in Ethiopia. The success of military operations and campaigns depend on reliable, effective, and timely deployment of forces, equipment, and on continuous support during the entire operation. Military Transportation System is designed to move people, goods and services efficiently, effectively, economically and safely from one point on the earth‘s surface to another (Cova and conger, 2004).

The transport department is responsible to coordinate and strength the logistics system safely, and also strengthen the capacity of several divisions and mechanized regiments administrative in order to ensure the provision of adequate and integrated combat service support in the cost efficient manner (Getnet Gedamu, 2019).

Every military operation is unique and has its own operating environment and sets of technical requirements. As a result, the execution of military operation is subject to numerous impacts of transportation that limit the commencement or progression of at the battle field operations, which invariably have significant negative influence on overall logistics performance. By definition, constraints refer to any condition, such as temporal/spatial limitations and safety/quality concerns, which may prevent in achieving its goals. Successful execution of logistics supply relies on managing the influences of transportation. A fleet management practice has become integral to the success of vehicle movement in institutions and must be a priority for organizations.

This study will aim at identifying the effect of fleet management practices on logistics performance at defense joint logistics main department transport department.

1.2. Statement of the Problem

Nowadays, Defense Joint Logistics Main Department Transport Department Fleet management includes commercial and military motor vehicles. Vehicle Fleet management included a range of functions, such as vehicle acquisition and registration under DJLMD sector, vehicle maintenance, vehicle telematics (tracking and diagnostics), driver

management, speed management, fuel management, health and safety management. Fleet Management is a function which allows companies which rely on transportation in business to remove or minimize the risks associated with vehicle investment, improving efficiency productivity and reducing their overall transportation and staff costs, providing 100% compliance with government legislation (duty of care) and many more (Choudhary, 2013). Fleet management is the management of a DJLMDTD transportation fleet. It includes management of commercial and military motor vehicles such as military vehicles, long base vehicles, buses and truck, (Musyoka, 2014) explains Fleet management as being the most important function in Ethiopian DJLMDTD. It involves scheduling and planning routes and ensuring that the buses run as per the schedule. Fleet management essentially also involves ensuring timely arrival and dispatch of motor vehicles. To go a step further fleet management system has proven to be effective in determining the precise location of a vehicle, dispatch, on-board information and vehicle recovery in case of any problems. So Ethiopian Defense Joint Logistics Main Department plays a vital role to overcome the war at the northern parts of Ethiopia against the rebels. Through effective Military science Fleet management requirements established a unique set of problems that differ from those of the commercial world (Carson, 2003).

Even though Ethiopia maintains considerable capabilities to transport its military forces to distant locations (FDRE Ministry of Defense, 2010), there are serious difficulties in the delivery of transportation service in the Ethiopian Armed Forces.

There have always been serious concerns in the leadership in ensuring the combat readiness of the Army which is also very critical to defend the homeland from adversary forces (Hailu, 2014). In the past two years, to do these one of the backbones was Fleet Management of Defense Joint Logistics Main Department Transport Department. Various efforts made to find solutions for the problem. Special attention was given to address the maintenance problems of the vehicles. Efforts made to supply spare parts and component parts of the transportation vehicles. In order to fill the gap in shortage of vehicles strategic procurement also made in procuring Volvo trucks, Ural trucks and Toyota single and double cabin including ambulances on supporting the current military operations. Even though some developments were observed in solving the problems the severity of the problem is still there

and the progresses are very little. There is a need of identifying the effect of fleet management practices on logistics performance of the armed forces and finding out possible solutions to the problems.

One of the challenges of fleet management is that customer requests arrive randomly over time, often requiring service within a narrow interval. Since it can take from several days to more than a week to move transportation equipment over long distances, it is not possible to wait until a customer request is known before moving the equipment. As a result, it is necessary to move equipment to serve demands before they are known. In actual applications, there are other sources of randomness, such as transit times and equipment failures. (B.Powel, 2005)

The researcher refers there has not been research on this issue, even if the issue was a matter of National security interest so it creates a great knowledge gap on this issue, to fill this gap the researcher motivates to do this research. Based on the gap, this thesis has its own rationale to perform by the following truth:

The researcher motive arises from the case study by Mebratu Hailu (2014) which targets one division located at Bure. The quantity and quality of the available vehicles are among the factors that determine the efficiency of the transportation service. From the 107 vehicles, more than 30% of them are not functional due to the shortage of spare and component parts. These problems together with the poor allocation of resources hinder the plan to be operational. Lack of coordination in the implementation of the plan is a deep-rooted problem of the transport department. Moreover, lack of flexibility and responsiveness with the changing environmental conditions is one of the drawbacks of the operators and the managers. These problems mainly arise due to lack of managerial ability of the transportation department of the 6^{th} mechanized division. The service is thus not satisfactory from a customer perspective.

Currently the transport department service is constrained because of a number of factors. Poor physical infrastructure in the country is one constraint for the transportation service of the DJLMDTD. This study intended to identify the effect of fleet management practices on logistics performance.

1.3. Basic Research Questions

1. How the DJLMDTD performs on fleet management practices (vehicle repair and maintenance management, fuel management, driver training and management, and vehicle schedule and routing) to logistics performance at DJLMDTD?
2. What is the relationship between each determinant of fleet management practices (vehicle repair and maintenance management, fuel management, driver training and management, and vehicle schedule and routing) and logistics performance at DJLMDTD?
3. What are the challenges of fleet management practices at DJLMDTD?

1.4. Research Objectives

1.4.1. General Objectives

The purpose of this research is to study the effect of fleet management practices on logistics performance: the case study of Defense Joint Logistics Main Department Transport Department at Addis Ababa, Ethiopia.

1.4.2. Specific Objectives

1. To describe the effect of fleet management practices on logistics performance.
2. To explain the relationship between each predictor of fleet management practices (vehicle repair and maintenance management, fuel management, driver training and management and vehicle schedule and routing) and logistics performance at DJLMDTD.
3. To identify the challenges of fleet management practices at DJLMDTD.

1.5. Significance of the study

This study attempts to explain the features of the transport services in Defense Joint Main Logistics Department Transport Department with the main emphasis on the effect of fleet management practices on logistics performance. The leaders and all members of the DJMLDTD are in need of understanding the effect of vehicle fleet management and the fundamental causes of the problem as well as the remedial measures to be taken in solving

the problems. They are demanding for the provision of effective and efficient transportation service for the success of their missions. Hence, this study contribute its role to support the armed forces by investigating the effect of fleet management practices and implementation process of the transportation service and there by exploring the possible solutions for the identified problems. Moreover, this paper could be used as initial reference for those who are interested to conduct further studies on the transportation sector of the Ethiopian Defense Forces.

1.6. Scope of the Study

The scope of this study is limited to the effect of fleet management practices on logistics performance under the EDF particularly to the Defense Joint Logistics Main Department Transport Department found at Kality sub city Addis Ababa, Ethiopia.

1.7. Limitation of the Study

The researcher faced some limitations during the course of research. Due to the delicate nature of the study, top management of the DJLMDTD was unpleasant for giving information. Particularly, the respondents feared that information would be used for other purpose. Moreover, the top management, which comprised the target population, not readily accessed. This was due to their busy schedules and long appointment.

Thus, the researcher tried to minimize the effects of these limitations by established a very close relation with the whole respondents.

1.8. Definition of terms/concepts

Fleet Management: The field of real-time fleet management has steadily grown over the past few years. This increased interest comes from recent economic and technological developments, where modern economy markets tend to become increasingly open and competitive. Companies now need to focus on timeliness to insure not only competitiveness but also their survival. A key element in achieving this goal is the elaboration of efficient, just-in-time, distribution, systems where goods are delivered at the right place, in the right quantity, and exactly when needed. (Zeimpekis, 2007)

Fleet tracking/telematics: is a multidisciplinary area of study that embraces communications, vehicle technologies, road transport and care, electrical engineering (sensors, dashboard, remote, communications etc.), and computer science. Simply, telematics is a mechanism/tool used for tracking vehicles and assets (UNHCR, 2016)

Global positioning system (GPS) – A technology that uses the signals and data from multiple satellites to determine a location anywhere on earth. The GPS constellation consists of 24 orbiting satellites with four equally spaced around each of six different, orbiter planes. (UNHCR, 2016)

Vehicle maintenance and repair: Rolling vehicle maintenance costs can be broken down into several categories. For cost tracking, purposes many carriers will divide this category into inspections and preventive maintenance, other maintenance, and unscheduled repairs (Keller, 2014)

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

Transportation Modalities: In transportation, goods can be shipped by the modalities parcel and express, air, road, sea, train, and intermodal. The key variables are transit times and costs. Faster transportation is more expensive. The actual weight costs of a shipment depend on the shipper's and receiver's full addresses; dangerous or standard cargo; number of pieces; dimensions; net weight; volumetric weight; net volume; gross volume; stack ability; transportation by air, sea, road, or train required speed; and carrier. The highest running cost component for a transportation company is labor, followed by fuel, road taxes, IT, repair and maintenance trains and ferries, insurance and tires (Achahchah, 2019)

The freight transportation structure consists of the right-of-way, variables and carriers that operate within five basic transportation modes. A mode identifies basic transportation modes are rail, high way, water, pipeline and air (Donald, 2002).

Road Transport: Road freight is a modality to transport goods from one place to another by road. To cover the route between two destinations motorized vehicles are used. The required investment in equipment is low compared to other modalities, which makes it easy for competition to enter the market (Achahchah, 2019)

Cost: is the greatest single issue that can cripple a motor carrier. Excessive costs, or lack of effective cost control program, can cause any carrier to become unprofitable. A fleet management professional must understand that not all costs are bad. Some costs are an investment, reducing costs in another area. An example of this is equipment purchases. Newer equipment can create a significant cost, both figured monthly and per mile. The most common costs among trucking companies are the driver, fuel, tires, administration and depreciation (Keller, 2014)

All the other cost factors are certainly necessary in order to capture the needed revenue (Keller, 2014)

Rolling and variable costs: The operation incurs these costs when the vehicles are operating. Another way to think of rolling and variable costs are they are the costs that would not be incurred if the vehicles were left parked. Rolling and variable costs include driver pay, fuel, tires, road tax, tolls, vehicle depreciation acceleration, loading and unloading (' lumper' or 'dock' fees, Scaling fees, fines, accidents and claims (Keller, 2014)

1.9. Organization of the study

This paper is organized in five chapters. The first chapter is about the introduction part including background of the study, significance of the study, scope of the study, and limitation of the study. The second chapter is about the review of related literature both conceptual and empirical literature on transportation. The third chapter explains the methodology of the research. The fourth chapter focuses on the data presentation, analysis and interpretation of the findings and the fifth chapter is the conclusion and recommendation part.

CHAPTER TWO

2. REVIEW OF RELATED LITERATURE

2.1. . Introduction

This chapter presents a critical reviewing of related literature that deals with the impact of fleet management on military operation logistic supply.

2.2. Theoretical Literature Review

2.2.1. Fleet Management

The physical movement of materials between points in a supply chain to achieve high levels of reliability and cost-efficiency. A qualified fleet manager has to ensure that there is no interference between different activities on the fleet. (Gitahi, 2014)

Fleet management's problems are shifting beyond cost-effectiveness toward superior customer satisfaction, versatility and sensitivity to requirements that differ at an unimaginable time scale even a decade ago. Classical fleet management approaches have struggled extensively with cost efficiency concerns over the past 40 years by creating routing plans in a wide variety of practical problems. (Giaglis et al., 2007)

The logistics management system (LMS) helped the fleet management with proper utilization of the fleet and ensuring maximum capacity. The customers are also informed via trackable links where they could not only track their orders but also set an expectation as to when the orders will be delivered to them. ((Vivaldini et al., 2012))

Information technology systems affect competition in the logistics sector in three distinct ways. Firstly, ICT systems may change the structure of the logistics industry, and even modify the rules of competition. This is due to the fact that ICT systems offer new value-added services that previous paper-based administration could not. Moreover, the ICT systems lead to higher efficiency and effectiveness, which affect their competitiveness. Secondly, ICT may be used to create sustainable competitive advantage and provide firms with new competitive instruments. Thirdly, ICT systems do not necessarily need to change existing processes, but rather facilitate their execution within the current business model. (Azevedo, 2007)

Technology is usually the driving force behind such discoveries. Organizations that manage fleets or a mobile sales force as well as field service organizations are facing many

challenges. These challenges include improving compliance and organizational communications, reducing costs, and improving customer satisfaction. As a result, fleet management systems are perceived in terms of how they are able to benefit companies by realizing efficiency and profitability. In the knowledge-based economy of today, the rapidly changing and uncertain environment means that transport firms are facing their biggest challenge in how to address the current situation and capture a competitive advantage. The increasing competence in the market is an important factor that drives the adoption of new technologies and innovation, as companies search for new opportunities to cut costs by improving process efficiency or by developing new products (Hidalgo, 2009).

Technology continues to remain one of the most important aspects in supply chain organization. It acts as a driving force and helps in fulfilling orders efficiently and speedily. Organizations that manage fleets or a mobile sales force as well as field service organizations are facing many challenges. These challenges include improving compliance and organizational communications, reducing costs, and improving customer satisfaction. As a result, fleet management systems are perceived in terms of how they are able to benefit companies by realizing efficiency and profitability. ((Begashaw, 2018).

In the knowledge-based economy of today, the rapidly changing and uncertain environment means that transport firms are facing their biggest challenge in how to address the current situation and capture a competitive advantage. Customers had no information as to when the driver would be there to deliver their orders. This not only lead the drivers to come back with high number of orders as reschedule but giving the customers time to change their mind to cancel their orders. With the help of the system the customer could manage his/her expectations and also reschedule their delivery time which helps the fleet management to plan their deliveries accordingly. (Begashaw, 2018)

Fleet management is the management of a company's transportation fleet. Fleet management includes commercial motor vehicles such as ‘Matatus’/ ‘mathrees’, cars, buses and trucks. Fleets can either be managed by an outside company or by a fleet manager employed within the business (Musyoka, 2014). Managing a fleet is a lot of work because it involves responsibilities such as mapping out the best routes, keeping track of the vehicles through Global Navigation Satellite Systems (GNSS), monitoring repairs and maintenance,

reimbursing drivers, keeping track of receipt stacks and reimbursement checks, and more importantly tracking fuel consumption (Mweyn, 2008).

2.2.2. Vehicle maintenance and repair

Rolling vehicle maintenance costs can be broken down into several categories. For cost tracking purposes many carriers will divide this category into inspections and preventive maintenance, other maintenance, and unscheduled repairs. Here is a brief list of the rolling maintenance and repair costs associated with operating the vehicle:

• Tires (covered earlier as a separate cost).

• Preventive maintenance services (oil changes, lubrication, scheduled component overhaul and replacement, etc.).

• Oil and lubricant between services.

• Unscheduled overhaul or replacement of components.

• Unscheduled repairs.

• Truck washing and painting.

There are several factors that can increase vehicle maintenance costs. Here are factors that enter into the vehicle maintenance costs:

• Age of the vehicle.

• Preventive maintenance schedule.

• Driver's driving techniques.

• Driver's care of the vehicle.

• Ratio of preventive maintenance verse unplanned repairs (which are more costly).

• Losses incurred by downtime. (Keller, 2014)

2.2.3. Fuel Management

Fuel network structures: Fuel networks are agreements with fuel stops, fuel chains, or fuel suppliers. Fuel networks allow the carrier to negotiate the best possible price for fuel at all times. Many fuel networks involve the carrier paying cost for the fuel, as established by contract, plus a fee (cost-plus programs). Another way these programs are structured is based on a "discount" off the pump price. Both programs can be straightforward, based on a specified fee or discount in cents per gallon or percentage, or they can be more complex, adjusting the fuel pricing to the number of gallons purchased. There are several ways fuel networks can be established. (J.KELLER, 2014)

Exclusive network agreement: Under this arrangement the carrier attempts to leverage the maximum negotiating power available to them by negotiating to purchase all fuel from one supplier. The supplier, in exchange for the guaranteed business, will provide the carrier with a reduced price on the fuel through either a cost-plus program or a discount. Many fuel companies offer nationwide fuel networks, which includes the use of their fuel credit card. (J.KELLER, 2014)

Company network. A company network is built by studying the movements of the fleet, locating fueling locations that would best serve the fleet, and then negotiating directly with fuel stops in those locations. To be most successful at this the carrier will need to project the fuel purchases (in gallons and frequency) the carrier will be making at each fuel stop. (J.KELLER, 2014)

Off-network fueling: The Fleet Manager will need to consider having a tracking mechanism in place to identify problems with the network. Problems can include not having a fuel stop in a needed location and drivers not using the existing stops. Fuel stops that are too far apart will lead to drivers not using the fuel network to its best capacity. If the driver needs to fuel off-network because stops are too far apart, the driver will generally fill up, rather than get just enough fuel to make it to a network fuel stop. This is because drivers do not like to stop for fuel any more often than is necessary. Fuel stops cost time, and in most circumstances the driver must log on-duty time for the fueling. To avoid this, provide fuel stops that are within range of each other based on the fuel capacity and fuel mileage of the company vehicles. The opposite can also be true. If fuel stops are located too close together, the fleet's purchasing power will be diluted. This can lead to the loss of the discounts the network was intended to realize. If the distributor or retailer feels the network is not helping their fuel stops, they may reduce the discount or drop the discount program completely. (J.KELLER, 2014)

Fuel hedging: Fuel hedging is advance purchases of fuel via bulk buying or entering into contracts for fuel at a fixed price for future delivery. This is done to protect against the shock of anticipated increases in price. While extremely popular at one time, the use of hedging has decreased. (J.KELLER, 2014).

Fuel managing methods, on the other hand, systematize the gathering of fuel records and quantity the many actions associated with refilling, doing away with a human mistake, and assisting the supervisor realize the facts (Kolman, 2010)

2.2.4. Driver Management

Driver training is a process that cannot be the same for everyone because some drivers may need more, and some less, training. Training can be separated into four steps. The first step is called the initial training This stage deals with the knowledge and skill required of a driver to

perform the job correctly. The next step is the refresher training This stage consists of a few days of classroom instruction used to update drivers on news, rules, and new equipment. Refresher training is held once a year or as needed, depending on the introduction of important rules and regulations that drivers must know about in order to perform their jobs safely. The third step is called remedial training Remedial training is mainly used for drivers who have had accidents while driving. This stage is designed to inform drivers of what they are doing wrong and to identify any lack of knowledge they may have so they can avoid accidents. The last stage, considered the most important, is ongoing training, which is necessary to keep drivers on track and keep them from falling into any unsafe habits. Ongoing training includes classroom training, safety posters, bulletins, driver handbooks, and letters to the drivers to inform them of their performance. (Della-Giustina, 2004)

Driver recruiting: Many carriers have gone to "headhunters" that specialize in driver recruiting to reduce, or in some cases eliminate, the recruiting staff. These services function as either the entire recruiting department of a carrier; finding the applicant, screening, then qualifying the applicants, or simply as a service generating applications for the carrier. In this second example, the carrier simply pays for valid applicants or hires, depending on the contract agreements. (J.KELLER, 2014)

Training: Hiring a training facility, or a training consultant, to conduct the carrier's orientation, required training such as entry-level driver training and hazardous materials training, and driver safety meetings, is another possibility to lower support costs. A carrier can choose to do this for several reasons, the main one being it can eliminate the need to have an instructor on staff full time, while maintaining expertise in this area. One misconception that carriers have in this area is that by using an outside training facility they will have someone to share liability with if the driver is involved in a crash. This is not true. The carrier is responsible for making sure the driver is qualified to operate the assigned vehicle based on training or experience. All training the driver received will be called into question, but the carrier will ultimately be held responsible, and liable, for the driver's training and actions. Before placing any driver on the road, verify that the training the driver has received, whether from your company or someone else, is adequate. (J.KELLER, 2014)

2.2.5. Vehicle Schedule and Routing

Scheduling &Tracking Scheduling is to identify which vehicle is to be allocated to new facilities as well as the new route for the chosen vehicle. In addition, tracking is knowing the vehicle status and location and aid with the implementation of new emergency calling plans for vehicle assignments. (Giaglis et al., 2007)

The use of an initial schedule, although it is not appropriate to resolve incidents that are likely to occur during the implementation of the schedule and have a substantial effect on the performance of the program. Typical examples are customer orders that arrive in real time and should be served by vehicles already on route as well as disturbances due to traffic delays, Break downs. The ability to deal with these cases in a satisfactory manner is essential for the profitability of logistics and transport related operations. (Giaglis et al., 2007)

Routing: The accumulation of combat units and supplies in the theater of operations is executed by moving these military assets from their home bases and peacetime storage facilities to the theater of operations. The first destinations of these assets are the gateways to the theater of operations: ports of debarkation (in a power-projection scenario) or dismounting areas (in a forward deployment scenario). From these gateways, military forces move to assembly and staging areas. In terms of the logistics network, the force accumulation process generates a flow of military assets on the external LOCs that connect the source nodes at the strategic level with the intermediate nodes at the operational level. A typical problem in this process is to select the most appropriate LOCs for moving the force, namely, to find the best routing. Geographical, topographical, political and most of all operational constraints affect the selection of these LOCs. (Moshe, 2022)

Dispatch Prioritization: The second issue to be addressed is the order at which units are to be sent to the theater of operations. The main factor in determining this order is operational. It is derived from the military posture and the operational plans. The induced priority order in the force accumulation process determines, in particular, the rate at which the ratio between combat forces and support units - the "tooth to tail" ratio - changes over time and space. (Moshe, 2022)

Scheduling: The third issue is timing the dispatch of ships, aircraft (in a power projection scenario), and trains or convoys of vehicles (in a forward deployment scenario). The schedule is determined by the priority that is assigned to each shipment, by the availability of

means of transportation and LOCs, and, most of all, by operational considerations. For example, in ground transportation, when scheduling the dispatch of convoys of vehicles, the objective is usually to minimize the accumulation time in the theater of operations such that the combat force is ready for battle as early as possible. It is however also important to minimize the time spent end-route and thus minimizing the exposure of the units to enemy's hostile activities. These two objectives are attained if the interaction among convoys is minimal so that one convoy (e.g., a slow-moving convoy or a convoy that crosses an intersection and therefore occupies it) does not hinder the movement of another. (Moshe, 2022)

2.2.6. Logistics Performance

Which is the ability to consistently deliver requested products within the requested delivery time frame at an acceptable cost, is highly important in achieving overall performance. An efficient logistics operation will facilitate in increasing the fighting power of a military organization as soldiers not only needed weapons, but food and ammunition to carry out their duties well. In an increasingly challenging environment, which is reflected by uncertain demands and rapid technology development, cost pressures remain high. In addition to cost, the military organization is also facing complexities owing to the considerable distance that the materials and supplies must traverse between the different nodes along the supply chain. In the military context, it was traditionally thought that having abundance of supplies ensured that logistics service providers would be able to provide everything needed to achieve the desired performance. (Rahim, 2019)

Performance management aims at achieving high performance by an organization and its people. According to Armstrong & Baron (2005), high performance includes that the organization reaches and exceeds its targets for productivity, quality, customer service, growth, profit, and shareholder value. To be detailed, it means to do the good better, share understanding about what is to be achieved, develop the capacity of people to achieve it, provide the required support and guidance to the people in order for them to deliver high performance and achieve their full potential to benefit themselves and the organization. Nowadays, advanced performance management system is used as strategic weapons in order to achieve competitive advantages (Dressler, 2004)

2.2.7. The purpose of a Safety program

Safety: Global trade security risks and regulations, such as the recent introduction of the Electronic Logging Device (ELD) for the truck drivers in the U.S. to log their working hours (and in some countries it is not allowed anymore to sleep in the truck during the weekend) are increasing. The ELD records the driving time of a trucker automatically to better control the driver's hours of service and increase the general traffic safety. Other reported advantages are a faster matching of the fuel receipts, insight into how much time was needed for a customer stop, how many stops there were, and the amount of empty driven kilometers. However, where previously time spent waiting in, for example, a traffic jam was often not registered as driving time, the ELD does. This reduces the driver's productivity. Managing risks becomes an important part of a successful supply chain management. Companies are re-designing their supply chains to adapt to the stricter global trade security challenges. Shippers map their goods flows, identify threats and vulnerabilities, and create a supply chain security plan to become compliant. Typical security measures are screening and sealing containers and trailers before shipping, locking doors, blocking access for unauthorized people to storage areas, and archiving shipment documentation. Storage locations need to have secured gates and parks, alarms, lights, locks, and video monitoring. It is important to check the background of both the current and new employees. In some countries, it is required to handover a "certificate of good behavior." People need to receive an awareness training to detect possible risks such as terrorism and smuggling. There must be IT security policies for passwords and onboarding of new employees. Goods need to be secured in transportation, carrier hubs, and storage locations. (Mohamed, 2019)

A fleet safety program is designed to systematically reduce the number of on-and-off the job work related injuries. It should address management standards and policies; the recording of incidents and injuries; program results; employee selection, hiring and training; and reward programs. (Della-Giustina, 2004)

Main elements of a fleet safety program: A fleet safety program consists of the following main elements;

- Management leadership
- A written safety policy
- Safety responsibility assignment

- Accident reports
- Driver selection
- Vehicle safety
- Employee safety
- Off-the-job safety
- Safety supervision
- Interest sustaining activities
- Integration of a safety with the job. (Della-Giustina, 2004)

2.2.8. Tracking repair and maintenance costs

It comes as no surprise that the cost of repair and maintenance, no matter how large or small the fleet, often times is the major factor determining the difference between profit and loss. It is also well known that commercial motor vehicles will need maintenance from time to time, and that some may even break down on occasions causing another expense that managers desperately try to minimize. But, as long as the trucks keep running, no one seems to be concerned. That is, until maintenance problems start affecting the bottom line. In that scenario lies an opportunity for management to get ahead of the cost of repair and maintenance to their fleet and uncover much more than simply how much is spent on keeping the fleet rolling. Tracking repair and maintenance costs will give management a database that can be analyzed to assess maintenance efficiency. It makes little difference whether the fleet is serviced by their own shop and technicians, by a local vendor, or by a combination of the two. Tracking "what" is being repaired along with the cost to repair it is only a portion of the data available. (J.KELLER, 2014)

2.2.9. The Essence of Logistics

Military logistics is a multi-dimensional and complex entity that constitutes one of the most important and essential components of warfare. However, similar to other intangible and complex terms such as economics, strategy, policy and intelligence, the term logistics is difficult to define, or even explain, in a few simple words. In the most general (and not very useful) language, we can say that logistics may be viewed as a complex mix of physical entities, processes and rules - that is, as a system - that is governed by mostly abstract

concepts and principles. This complex mix is, however, a critical ingredient in any attempt to conduct war, and constitutes logistics raison deter. Throughout history, numerous military leaders did not realize the essence of logistics and failed to appreciate its impact on the battlefield. They paid dearly for their negligence. George Washington in the American War of Independence, Napoleon in Spain and in Russia, General Ludendorff in WWI, Field marshal Montgomery in WWII and General MacArthur in the Korean War are just a few examples of commanders who excelled in combat planning and execution, but whose disregard of logistics resulted in grave operational consequences (Moshe, 2022).

2.2.10. The Purpose of Logistics

In spite of the elusiveness of its definition, the purpose of logistics is quite clear: to support the waging of war and to sustain the troops who take part in it. In particular, the purpose of logistics

is to facilitate movement and fire, to treat and evacuate casualties and to deploy and position human resources, and supply them with food and other personal needs. Logistics also fulfills a psychological function by affecting morale. As a provider of military resources, logistics play an important role in unifying the force, preserving its motivation and strengthening the moral authority of its commanders. (Moshe, 2022).

2.2.11. Transportation

The transportation infrastructure comprises two types of components -static components and dynamic components. The static components are manifested in the physical attributes of the lines of communication (LOC). These components include the network of roads, railways systems, waterways, sea-lanes, aerial routes, seaports and airports. The dynamic components are means of transportation such as cargo planes, ships, containers, trains, trucks, and transporters. (Moshe, 2022).

Logistic resources are the entities - materiel and personnel - that flow through the logistics network. Their common objective is to sustain and support the military operation. Thus, logistic resources constitute logistics network Means of Transportation facilitate the flow of resources in the logistics network by carrying personnel, equipment and supply. Typical means of transportation are trucks, tankers, transporters, trains, ships, helicopters and airplanes. Logistics Deployment is a specific implementation of the logistics network. In particular, logistics deployment determines the size, composition and location of the theater

facilities. It also determines the lines of communication and affects the feasible flow rate and the mixture of the logistics flow that passes through the network. The Logistics Support Chain is a conceptual cyclic sequence of processes and events with the common objective to sustain the military operation in progress. The chain comprises two main parts: the demand part and the supply part. At the demand part, the tactical units present their requirements, which are passed on, through the command channels, to the logistics sources - operational or strategic. At the supply part, resources are transported through the logistics network from source or intermediate nodes to the tactical destinations. Evacuation of personnel and equipment are also a part of the logistics support chain - constituting a flow from the tactical nodes backwards. One of the most critical requirements of any military logistics system is the ability to move forces and resources. (Moshe, 2002)

2.2.12. Transportation Modalities

In transportation, goods can be shipped by the modalities parcel and express, air, road, sea, train, and intermodal. The key variables are transit times and costs. Faster transportation is more expensive. The actual costs of a shipment depend on the shipper's and receiver's full addresses; dangerous or standard cargo; number of pieces; dimensions; net weight; volumetric weight; net volume; gross volume; stack ability; transportation by air, sea, road, or train; required speed; and carrier. The highest running cost component for a transportation company is labor, followed by fuel, road taxes, IT, repair and maintenance, trains and ferries, insurance, and tires. Shippers generally agree on rates with their transportation companies for a year or longer. The rates are an average over the year and potentially include a market volatility risk mitigation cost part as the actual costs depend on the transportation capacity in the market and the time between the request for quotation and the goods movement. The shorter this time span, the higher the rates as the transportation capacity decreases. The closer to the shipping moment, the lower the transportation capacity, the higher the rates. The potential advantage of fixed longer-term rates can be the security of having enough capacity to move all the goods throughout the whole year including the high season period. The potential disadvantage is higher rates as the shipper does not benefit from the lower rates of the volatile market when the transportation demand is lower than the supply. The other way around, the potential advantage of tendering each shipment directly on the market is that a shipper can benefit from the day-to-day demand versus supply situation potentially leading to

lower rates. The disadvantage can be the higher rate in case of high demand. It can also be that there is no transportation capacity at all to move the cargo. (Mohamed, 2019).

2.2.13. Road Transportation

Road freight is the modality to transport goods from one place to another by road. To cover the route between two destinations motorized vehicles are used. The required investment in equipment is low, compared to the other modalities, which makes it easy for competition to enter the market. The result is that there are many small carriers, who compete on mainly price. The cost of constructing, operating, and maintaining roads is cheaper than, for example, railways. It is a cost-effective means of carriage and it enables door-to-door delivery of materials. Road transportation is often the only way for carrying goods to and from rural areas where no rail, water or air is available, and between cities, towns, and small villages. It is also a relatively fast and reliable mode of transportation, which can be ordered at any preferred day and time. However, a truck can load a limited volume, has weight and measurement restrictions, is frequently impacted by adverse weather conditions and traffic jams. (Mohamed, 2019)

2.2.14. Force Accumulation

Mobilizing and building up the military, force in the theater of operations is the most critical activity during the early stages of a campaign. This activity comprises three aspects that must be addressed concurrently: routing, prioritization and scheduling. (Moshe, 2022)

2.2.15. Logistics Deployment

The logistic rationalization of an operation embodied in the logistics deployment in the theater of operations. It comprises setting up the logistics nodes such as ports of debarkation, supply points, ammunition dumps, maintenance areas, transfer points, CSS units and facilities, and selecting the corresponding LOCs - roads, railways, air routes and sea-lanes. In terms of the logistics network, logistics deployment amounts to determining the size, shape, composition and location of intermediate and destination nodes, and selecting the internal LOCs. Determining the logistics deployment is one of the most crucial decisions that are taken at the operational level. (Moshe, 2022)

2.2.16. Convoys vs. Dispersed Travel

Ground transportation is typically executed by long convoys that may comprise up to few hundred vehicles. A convoy travels as a unified entity, which is centrally controlled by a commander and a small staff. The vehicles move in a column and no vehicle is permitted to overtake another unless ordered to do so. Moreover, a stalled vehicle - due to accident or mechanical problem - may slow down, or even hinder, the advance of the rest of the convoy. The interdependency among the vehicles in the convoy, and the rigid movement scheme that governs their travel, enhance the ability to control the convoy, but at the same time, they also reduce the average velocity of each vehicle. Alternatively, vehicles may be dispatched individually or in small groups. Each vehicle (or small group of vehicles) is assigned a transportation mission (i.e. a route and a destination), which is executed independently of other transportation missions. The advantage of this dispersed travel mode over convoys (also called Platoon Movement) is higher average velocity and thus shorter travel time to the assembly area. The higher agility of dispersed travel, compared to convoys, is demonstrated in the transitions between movement and parking. (Moshe, 2002).

2.3. 2 Empirical Literature Review

This section of the literature review will present the findings of other empirical studies related to the subject matter.

According to Cecere (2015), we are living in times when growth of global supply chains have stalled and many supply chains are stuck in driving supply chain performance which is attributed to poor fleet management with low ICT application, ineffective vehicle routing and poor customer service. Globally the application of ICT in fleet management is as low as 46% according to a survey done by Bloomberg (2014).

Transport management topic is a popular and many researchers are interested to investigate this area (Otieno.G.O, 2014) on their study the findings revealed that distance, destination, duration and demand as logistics support had a positive influence on military operations at Kenya defense force. It reaffirms what some of the previous researchers (Herberman, 2010) have found, that for NATO to field expeditionary forces that can move quickly to wherever they are needed and sustain the operations over long distance and time to achieve their objectives.

The most important thing in fleet management is cost management. The fleet manager must ensure that his/her activities are cost effective. Fleet managers oversee delegation of duties to large groups of personnel responsible for operating the vehicles within the fleet. This may include coordinating the employee schedule, managing communication between the drivers and headquarters, planning driving routes or alternate routes, as well as referring or solving problems that may crop up during the day such as accidents, absenteeism and automobile malfunctions. There are five main fleet management activities, these are pointed out as being; Routing and Scheduling, Fuel Management, Vehicle Acquisition, Vehicle Maintenance, Driver briefing and debriefing. These activities are supervised by the fleet managers and primarily, a policy is formulated to serve as a guide for these activities. (Ratcliffe, 2007)

(Gedamu, 2019). Hence, an increase in the transport 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 transport practices would result in changes in logistics performance positively. The regression analysis further showed that 67.6 % of the variation in the performance might be explained by transport factors in the study. This showed that the variables which included in the study high percentages factor for logistics performance. It implies that there are other factors or variables effect the performance (32.4%). The most experienced challenges where there were low acceptance levels for the transportation practices by the employees which scored the mean of 3.93 with the standard deviation of .893, while the least experienced challenges were lack of adequate funds with a mean value and standard deviation 3.62 and .974 respectively to advance for the manual transport operations.

2.4. Conceptual framework of the study

There is an effect on fleet management and its practical performance on logistics. Heavy Tactical Vehicles are not available as per to the needs of the Army. Armament carriers, logistics vehicles, ambulances, command and control vehicles are forced to be limited in their movements because of the shortage of spare and component parts. Some of these gaps are; Limited number of trucks, Shortage in availability of spare parts, the cost increment in transport rent fees, delay in supply fuel, turnover of personnel specially drivers and technicians.

In the conceptual framework below, represents the specific direction by which the thesis will have to be undertaken; and will describe the relationship between specific variables to be identified in the study (Brooke, 2015).

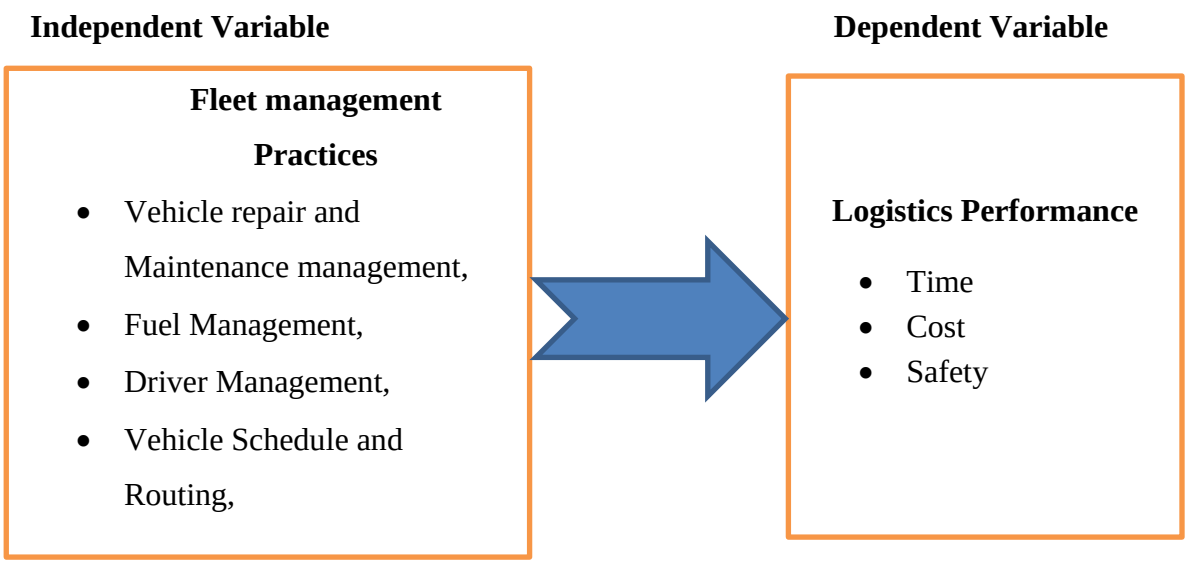

Figure 2.1: Conceptual framework adopted from, (J.KELLER,2014)

2.5. Research Gaps

Even if there are literature and articles concerning transportation and the effect of fleet management practices on logistics performance, but there is little literature concerning fleet management practice related to its influence on the logistics performance in military.

However, as far as the researcher investigated the study topic no research is carried out in Ethiopia directly related to the effect of fleet management on logistics performance. So, this study aims to fill the gaps of DLMDTD fleet management and pave ways for researchers to further investigate with fleet management on logistics performance.

CHAPTER THREE

3. RESEARCH METHODOLOGY

3.1. Introduction

The methodology considerations are the source of the data, study approach, sampling techniques, data collection method, and data preparation and analysis. It provides an overview of the methodological approach and the research design selected for the study.

3.2. Description of the study Area

Defense Joint Logistics Main Department is located in Addis Ababa brunched under headquarters of the F.D.R.E Ministry of National Defense and the transport department is found in Addis Ababa ‘’Kality area sub city’’.

3.3. Research Approach

Among different research approaches, the researcher used both qualitative and quantitative research approach type for interpreting the findings adequately and accurately based on statistical data. The quantitative and qualitative Research Approach types would help the researcher to describe the existing effect of fleet management practices on logistics performance through questionnaire, one to one interview, on site/spot observation. Therefore, the research comprises both quantitative (numeric) and qualitative (descriptive) approach used in this study.

3.4. Research Design

The researcher used descriptive research designs. Descriptive research intended to describe the effect of fleet management practices on logistics performance. Descriptive research is used to obtain information concerning the current status of the phenomena to describe “what exists” with respect to variables or conditions in a situation. (Mugenda, 2003). The approach follows owing to the nature of the existing problem study and the quality of this research design to describe, explain and validate findings (Kothari, 2003).

3.5. Population and sample

3.5.1. Target Population

The populations of the study were the employees of the transport department. The total numbers of employees were 204. The nature of the population is highly diversified. These employees were from different demography in terms of age group, gender, and ethnic group. Moreover, these employees graduated from different universities and colleges from over the country. In all its correspondence and daily activities, DJLMDTD used English and Amharic as the formal language. However, based on the nature and characteristics of the research, the researcher grouped the whole above population as the following group of population in the study, those were Head office (12), Maintenance and Inspection (25), Supply and Storage of vehicles (30), Administrative and Finance (18), Transport Operators (52), and Referral Garage (67), totally 204.

3.5.2. Sample Size Determination

For this study, the researcher used stratified sampling techniques. For the reason defense joint logistics main department transport department is highly diversified and need to be stratified to get adequate representation from each stratum. Therefore, the researcher classified the population in to six main strata, based on the departments. These were head office, Maintenance and Inspection, Supply and Storage of vehicles, Administrative and Finance, Transport Operators, Referral Garage, used in the study due to their expertise and experience. Once the strata identified, sample was randomly picked from the master lists using random sampling. The reason to take sample from population requires less recourse than a census and time factor. Sampling helps to collect vital data quickly.

Determining of Sample Size (n):

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

Therefore, the researcher used (Yemane, 1967) formula; which is calculated mathematically as follows:

Where: n = the sample size

N=the study population

e = the level of precision, 1 = designates the probability of the event occurring

Therefore: from the formula $n = \frac{N}{1+N(e)^2}$

n = the sample size = $\frac{204}{1+204(0.05)^2}$

Therefore, n = the sample size= 135 respondents used as sample for this study to gather data through questionnaire.

The sample size for each department was calculated by using proportion. The study used proportionate sample allocation formula so as to make each stratum sampled identical with proportion of the population.

Formula; $n_i = \frac{n*N_i}{N}$

Where: n_i = the sample size for individual departments

N_i=the total number of employees in each departments/stratum

N = the total number of populations in the study

n = the total sample size for selected stratum

When using a stratified sampling technique, we usually follow the method of proportional allocation under which the sizes of samples from the different strata are kept proportional to the size of the strata. That is, if P_i represents the proportion of population included in stratum ***i,*** and n represents the total sample size, the number of elements selected from stratum *i* is $n.p_i$. (Kothari, 2004)

Table 3.1: Sample size determination

Departments	Total population of each stratum	Sample size of each Stratum
Head office	12	8
Maintenance and Inspection	25	17
Supply and Storage of vehicles	30	20
Administrative and Finance	18	12
Transport Operators	52	34
Referral Garage	67	44
Total	**204**	**135**

Source: (DJLMDTD Human resource Department 2022)

3.6. Data Sources and Types

The study used both primary and secondary data. This study would first review the effect of fleet management practices on logistics performance in defense joint logistics main department transport department.

The primary data collected from the selected military personals which contains and take into account all military rank holders and military commanders through semi structured interview of defense joint logistics main department transport department. The primary data collected from employees of the DJLMDTD both military and civilian by using a self -administered questionnaire that consist both open and more of closed ended questions that was designed to collect responses for qualitative and quantitative analysis respectively.

The secondary data was taken from ministry of national defense logistics main department annual reports, published and unpublished documents. In addition, information on the practical implementation of logistics manuals and rules, directives and the thought on the gap between logistics performance and practices collected from the logistics main department. According to (Bryman, 2012) the main reason that the researchers use secondary data source is that data are cheaper and more quickly obtainable. Therefore, it saves researcher effort, time and expenses.

3.7. Data collection Procedures

Because of its nature and goal of the study to be attaining, the researcher applied both Mixed (Probable and Non-Probable) sampling techniques which has been applied stratified sampling techniques to adhere to the underlying principle of randomness. However, it adds some boundaries to the process of forming stratification factor on representative by their occupations based on specific identity or purpose.

3.8. Validity and Reliability of Instruments

Qualitative: Questionnaire and interview considered as the major means of data gathering tools. The research questionnaires were checked using a pretest during data collection, using a small sample of respondents before a full-scale study, which helped the researcher to identify the problems in data collecting instruments.

This study tried to demonstrate facts and findings by using primary and secondary sources of data. The secondary data gathered from sources of published and unpublished documents collect from organizations' documents, reports, and related books. The primary data collected through the dissemination of questionnaires and session of interviews. In addition, questionnaires are translated to Amharic for most respondents who cannot understand English language.

Quantitative: the research used statistical methods to analyze quantitative data. Apply descriptive and inferential statistics. The researcher used a statistical a correlation analysis technique.

3.9. Reliability Analysis of the study

Reliability refers to how consistency a method measures something, if the same result can be consistently achieved by using the same methods under the same circumstances, the measurement considered reliable.

Reliability refers to the consistency of a measure, Psychologists consider three types of consistency: over time (test-test reliability), across items (internal consistency) and across different researchers. Reliability is the degree to which the measure of a construct is consistent or dependable, and also that reliability implies consistency but not accuracy (Bhattacherjee, 2012). Cronbach alpha measure of reliability was used. Correlation analysis

is used to observe the relations between variables and analyze data with the help of Statistical Package for Social Sciences (SPSS.V20).

Table 3.2: Reliability Statistics

Variables	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Vehicle repair and maintenance	.729	.729	5
Fuel Management	.832	.837	5
Driver Management	.937	.937	5
Vehicle schedule and routing	.897	.898	4
Logistics Performance	.898	.900	6

Source: SPSS.V20.

The above table showed that, the reliability test of the variables and the Cronbach's Alpha of all the variables is greater than 0.70. The closer Cronbach's alpha is to 1, the higher the internal consistency reliability (Uma Sekaran, 2003).

To summarize and analyze data the researcher used descriptive statistics (frequency, mean, and standard deviation).

3.10. Ethical Considerations

The researcher has taken considerations that all factual materials that is not original with the researcher accompanied by a reference to its source. Furthermore, maintain the ethical issues and respondents confidentially through using codes to link the respondent to a questionnaire and sorting the name to code, and refuse to give the names of respondent to anyone outside the research project and maintain from biased decision and plagiarism.

CHAPTER FOUR

4. DATA ANALYSIS, RESULTS AND DISCUSSIONS

4.1. Introduction

This chapter deals with data presentation, interpretation and analysis of the study. It shows the demography of respondents, data collected from the respondents through questionnaires. 135 questionnaires were prepared and distributed to DJLMDTD employees, out of these questionnaires 106 were filled and returned, the rest 29 questionnaires were not returned.

4.2. Response Rate

A total of 106 responses were received out of 135 questionnaires, achieving on acceptable response rate of 78.5%. According to (Fowler, 2022), a 75% response rate is considered adequate.

Table 4.1: Response rate

Department	Questionnaires distributed	Questionnaires Collected	Questionnaires Uncollected
Head office	8	6	2
Maintenance and Inspection	17	14	3
Supply and Storage of vehicles	20	15	5
Administrative and Finance	12	9	3
Transport Operators	34	29	5
Referral Garage	44	33	11
Total	**135**	**106**	**29**

On the other hand, interview was planned with a total of five middle level and high-level managers of defense joint logistics main department transport department from each department maintenance and inspection, supply and storage of vehicles, administrative and finance, transport operators, and referral garage and all of them were receptive, and the interview was conducted with all of them and shows 100% return rate.

4.3. Descriptive analysis

The researcher prepared questionnaires and the responses were based on a five-point Likert scale, which is 5= Strongly Agree, 4=Agree, 3=Neutral, 2=Disagree, 1= Strongly Disagree. The respondents were asked to indicate whether they agreed or disagreed with the statements regarding the effect of fleet management practices on logistics performance. The range of mean interpretation is from 1-1.80 represents strongly disagree, from 1.81-2.60- disagree, from 2.61-3.40-Neutral, from 3.41-4.20- Agree, and from 4.20-5 represents strongly agree. (Alexander, 2009).

4.3.1. Demographic analysis

Table 4.2: General information of respondents

Item	Category	Frequency	Percent (%)
Gender	Female	14	13.2
	Male	92	86.8
	Total	106	100.0
Educational status	MA/MSC	11	10.4
	BA/BSC	25	23.6
	Diploma/TVET	18	17.0
	Grade 12 complete & Certeficate (12+1)	23	21.7
	Below grade 12	29	27.4
Occupational Status	Administration	41	38.7
	Automechanic	21	19.8
	Driver	34	32.1
	Others	10	9.4
	Total	106	100.0
Service Year	1	45	42.5
	2	20	18.9
	3	19	17.9
	4	22	20.8
	Total	106	100.0
Age	18-30 Years	21	19.8
	31-45 Years	37	34.9
	46-55 Years	32	30.2
	Above 56	16	15.1
	Total	106	100.0
	18-30 Years	21	19.8

Source: Own study Questionnaire (2022)

Based on the above results in table 4.2, from the demographic characteristics of respondents, the biggest share is taken by (86.8%) was male and the remaining (13.2%) were female respondents.

Referring the results, most of the respondents were below grade 12 which is the least academic qualification with 29 (27.4%) respondents, while 11 (10.4%) respondents hold a Master's Degree. This shows that most of the respondents do not have good academic qualifications having a good work experience in transport service but do not have accesses to use the fleet management system by using technology.

Table 1 also shows among the four categories of work experience; the majority of them 45 (42.5%) do have a good experience serving for more than 10 years in DJLMDTD by upgrading their profession whereas the newly recruited personnel stands second as 22 (20.8%) less than 2 years. Accordingly, the third category accounts for 20 (18.9%) of the respondents give service 5 to 10 Years; the fourth group was 20 (17.9%) of the respondents give service 2 to 5 Years;

Besides, the large number of respondents who participated in the study was from the department of fleet management indicates they had adequate exposure to the work area and had the potential of bringing change to the organization.

4.3.2. Vehicle Repair and Maintenance Management

Table 4.3: Item Statistics VRM

Activities	Mean	Std. Deviation	N
The DJLMDTD has a controlling mechanism for genuine spare parts used for vehicle maintenance.	2.71	1.129	106
The DJLMDTD has professional fleet manager and maintenance supervisor,	2.62	.990	106
The repair and maintenance (refer garage) complete the service on time.	2.52	1.097	106
Drivers/operators of the DJLMDTD give feedback for fleet department about service and maintenance of the assigned vehicle.	2.75	1.225	106
The control system of DJLMDTD for vehicle repair and maintenance is successful,	2.33	1.119	106

The above table 4.3 showed that in the first statement, the mean is 2.71. Hence, it means that the majority of respondents were neutral for the point raised by the researcher whether the DJLMDTD has a controlling mechanism for genuine spare parts used for vehicle maintenance which is almost the score of this variable fall between the two extremes at neutral level.

Accordingly, the analysis for the second statement is 2.62 and the mean of the fourth statement is 2.75 in which almost the score of this variable fall between the two extremes at a neutral level. Therefore, repair and maintenance of the DJLMDTD has professional fleet manager and maintenance supervisor and Drivers/operators of the DJLMDTD gives feedback for fleet department about service and maintenance of the assigned vehicle were some of the anticipated variables that are assumed to have an effect on logistics performance.

The mean of the third statement is 2.52. Hence, it means that the majority of respondents disagree on the issue by the researcher whether the repair and maintenance (refer garage) complete the service on time and shows a delay in time observed in maintaining vehicles.

The mean of the fifth statement is 2.33. Hence, it means that the majority of respondents were disagree for the issue raised by the researcher whether the control system of DJLMDTD for vehicle repair and maintenance is successful or not and the result was most of the respondents were signifying vehicles repair maintenance management was not successful.

4.3.3. Fuel Management

Table 4.4: Item Statistics FM

Activities	Mean	Std. Deviation	N
The DJLMDTD adopts a good fuel management system.	3.50	1.062	106
The DJLMDTD provides sufficient fuel supply for military operations.	3.66	1.068	106
The transport department has a timely follow up for fuel consumption.	3.63	.949	106
The DJLMDTD has a potential fuel supplier all over the country.	3.57	.995	106
The DJLMDTD has an independent fuel controller.	3.48	1.089	106

Table 4.4 showed that, fuel management were one of the expected variables that are expected to have an influence on logistics performance, the first challenge which the respondents gave

higher mean scores was the question supposed that, The DJLMDTD provides sufficient fuel supply for military operations which is the mean score of 3.66, and the second higher score registered also for the question supposed that, the transport department has a timely follow up for fuel consumption which is the mean score of 3.63, and for the question the DJLMDTD has a potential fuel supplier all over the country which is the mean score of 3.57, also for the question the DJLMDTD adopts a good fuel management system the mean score of 3.50 and for the statement the DJLMDTD has an independent fuel controller which is the mean score 3.48 respondents replied on the question the department is successful in overall fuel management system.

4.3.4. Driver Management

Table 4.5: Item Statistics DM

Activities	Mean	Std. Deviation	N
The DJLMDTD is effective on assigning mission to drivers/operators.	2.63	1.214	106
The DJLMDTD has built a communication system with drivers/operators.	2.68	1.215	106
The DJLMDTD facilitate to give training to drivers/operators.	2.77	1.213	106
The DJLMDTD motivate disciplined drivers/operators by giving a reward.	2.81	1.156	106
The DJLMDTD has well organized supervision method on drivers/operators.	2.60	1.307	106

The above table 4.5 showed that in the first statement, the mean is 2.63. Hence, it means that the majority of respondents were neutral for the point raised by the researcher The DJLMDTD is effective on assigning mission to drivers/operators which is almost the score of these variable falls between the two extremes at neutral level.

Accordingly, the analysis for the second statement is 2.68, the mean of the third statement the DJLMDTD facilitate to give training to drivers/operators is 2.77, the mean of the fourth statement is 2.81 and the mean of the fifth statement is 2.60, in which almost the score of this variable fall between the two extremes at a neutral level.

Table 4.6 : Item Statistics VSR

Activities	Mean	Std. Deviation	N
The DJLMDTD develop a planning out time window for when deliveries will be made and who will make them.	2.45	1.164	106
The DJLMDTD develop a mapping specific route that drivers will take to make deliveries.	2.55	1.105	106
The DJLMDTD has a method of tracking current hours-of-service information on all drivers, and the information is checked prior to each dispatch.	2.49	1.326	106
In the DJLMDTD Route plans are compared to actual performance to verify compliance.	2.58	1.265	106

4.3.5. Vehicle Schedule and Routing

The above table 4.6 showed that, in the first statement, the mean is 2.45. Hence, it means that the majority of respondents were disagree for the issue raised by the researcher in which the department develop a planning out time window for when deliveries will be made and who will make them and the result was most of the respondents were signifying that there is no such kind of planning activity made.

The mean of the second statement is 2.55. Hence, it means that the majority of respondents were disagree for the issue raised by the researcher in which the department develop a mapping specific route that drivers will take to make deliveries and the result was most of the respondents were signifying that there is no mapping specific route.

Accordingly, the analysis for the third statement is 2.49. Hence, it means that the majority of respondents were disagree for the issue raised by the researcher in which the department has a method of tracking current hours-of-service information on all drivers, and the information is checked prior to each dispatch and the result was most of the respondents were signifying that the information is not checked prior to each dispatch.

The mean of the fourth statement is 2.58. Hence, it means that the majority of respondents were disagree for the issue raised by the researcher in which the department route plans are compared to actual performance to verify compliance and the result was most of the respondents were signifying that mostly in the department route plans are not compared to actual performance to verify compliance.

4.3.6. Logistics Performance

Table 4.7: Item Statistics LP

Activities	Mean	Std. Deviation	N
The DJLMDTD complete missions on time.	2.35	1.204	106
The DJLMDTD use a cost benefit analysis.	2.40	1.364	106
The DJLMDTD perform a transport service goes in line with end users satisfaction.	2.39	1.074	106
The DJLMDTD has safety policies which are signed and enforced by upper management.	2.37	1.229	106
The safety policies are reviewed and updated on a scheduled basis.	2.28	1.233	106
There are disciplinary measures including termination, in case of noncompliance with the safety policies.	2.25	1.243	106

The above table showed that, the dependent variable logistic performance consists of cost, time and safety. The average mean value of the three measures of logistics performance is 2.34 with a standard deviation of 1.2245, which indicate that there is disagree level; this shows that, there is weak logistics performance in the department. The average mean value of logistics performance is between 2.25 and 2.40 with a standard deviation between and 1.074 up to 1.364. As shown in the table above the DJLMDTD do not complete missions on time, delay mainly occurred for some security reason in which drivers/operators were obliged to drive the vehicles in convoy having a discipline to move slowly. The logistics performance measured in time, cost, end user satisfaction and safety with a mean value of 2.35, 2.40, 2.39, 2.37, 2.28, and 2.25 respectively which is low logistics performance is measured. The

researcher has checked the assumptions that the data must meet to make the analysis reliable and valid.

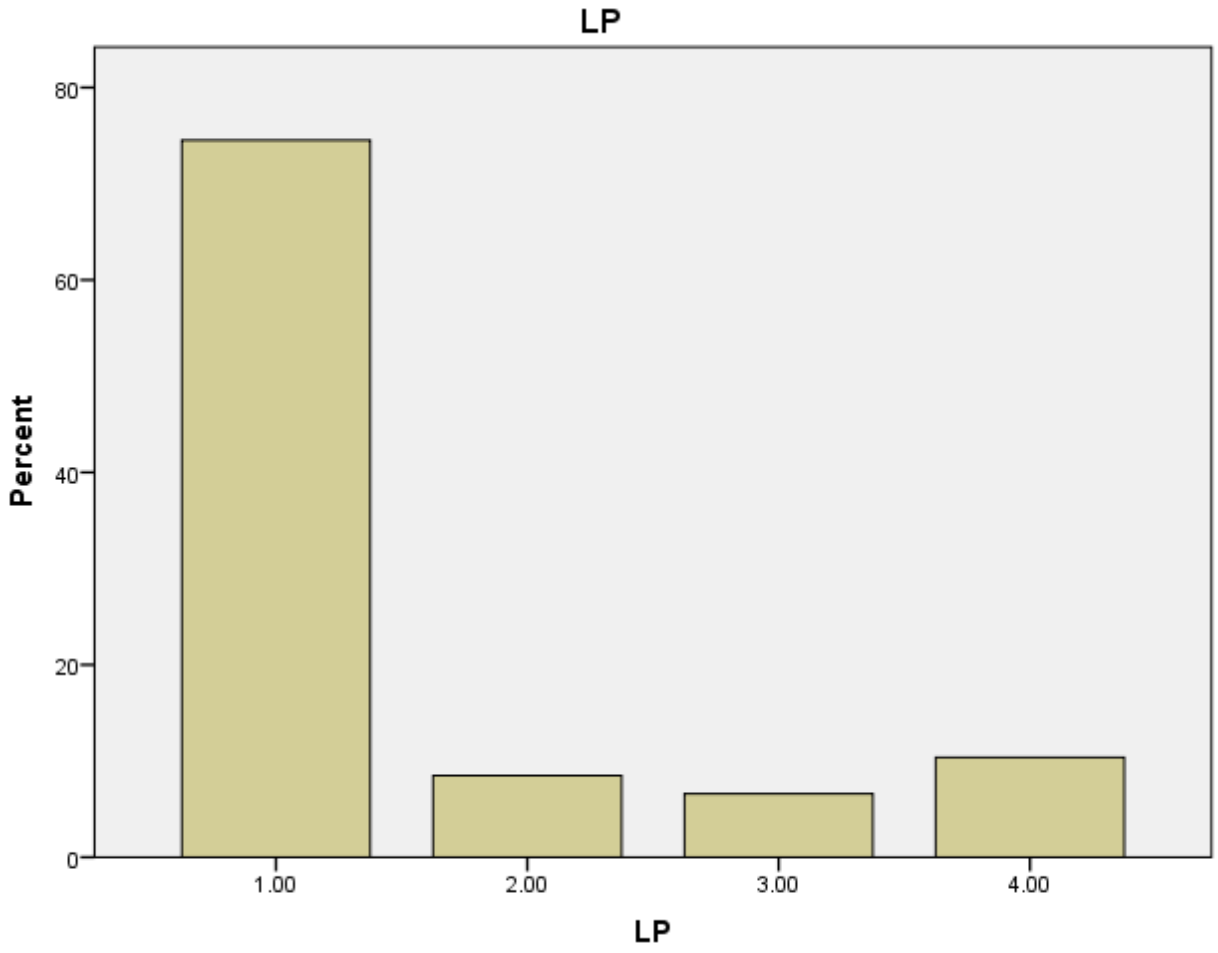

Figure 4.1: Logistics Performance (Source: Spss result)

As shown on table 4.7 and in the bar graph figure 4.1, the overall mean value of the six measures of logistics performance is 2.3 with a standard deviation of 1.22, which indicate that there is disagree level, this shows that, as there is low logistics performance. The average mean value of logistics performance measures is between 2.25 and 2.40 with a standard deviation between 1.243 and 1.364.

Spearman's Correlation Analysis

The researcher first checks the data whether normally distributed or not in order to meet the assumptions.

Table 4.8: Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Driver Management	.211	106	.000	.853	106	.000
Fuel Management	.205	106	.000	.874	106	.000
Logistics Performance	.445	106	.000	.566	106	.000
Vehicle Repair Management	.182	106	.000	.883	106	.000
Vehicle Schedule and Routing	.196	106	.000	.861	106	.000

a. Lilliefors Significance Correction

From the tests of normality table, Shapiro-Wilk, the significance is <0.05 so that the data is not normally distributed the data was non parametric. Hence, the researcher applied spearman correlation analysis.

Spearman ranked order correlation is a statistical measure of the direction and strength of the monotonic between the two continuous or ordinal variables.

Assumptions of Spearman ranked order correlation;

- ✓ The two variables must be ordinal (Likert scale) or scale (interval or ratio).
- ✓ One variable must be monotically related with the other. As X variable increases, Y variable should either decrease or never increase.

The correlation coefficient is a statistical measure which determines how strongly the pair of variables are correlated or connected. It is denoted by "r'". Fundamentally, the coefficient of correlation "r" will range between -1 and +1, i.e., $-1 \leq r \leq +1$ (Senthilnathan, 2019).

Spearman's rho correlation coefficient value with 0 indicates no relationship, 0 to +-0.3 indicates weak positive or negative relationship; from +- 0.3 to +-0.7 indicates moderate

positive or negative relationship; those between +-0.7 to +-1 indicates a strong positive or negative relationship; +-1 perfect positive or negative linear relationship (Ratner, 2017).

Table 4.9 Correlation

			Vehicle Repair Management	Fuel Management	Driver Management	Vehicle Schedule and Routing	Logistics Performance
Spearman's rho	Vehicle Repair Management	Correlation Coefficient	1.000				
		Sig. (2-tailed)	.				
		N	106				
	Fuel Management	Correlation Coefficient	.005	1.000			
		Sig. (2-tailed)	.961	.			
		N	106	106			
	Driver Management	Correlation Coefficient	-.327**	.157	1.000		
		Sig. (2-tailed)	.001	.109	.		
		N	106	106	106		
	Vehicle Schedule and Routing	Correlation Coefficient	.136	.117	-.034	1.000	
		Sig. (2-tailed)	.165	.232	.731	.	
		N	106	106	106	106	
	Logistics Performance	Correlation Coefficient	**.069**	**-.072**	**-.020**	**-.077**	1.000
		Sig. (2-tailed)	**.481**	**.464**	**.841**	**.434**	.
		N	106	106	106	106	106

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

Table 4.9. Showed that, there is a weak positive relationship between logistics performance and Vehicle Repair Management with r_s =(104)= with (p=0.069, p=0.481).

There is a weak negative relationship between logistics performance and fuel management with r_s =(104)= with (p=-0.072, p=0.464).

Accordingly there is a weak negative relationship between logistics performance and driver management with r_s =(104)= with (p=-0.020, p=0.841).

There is a weak negative relationship between logistics performance and Vehicle Schedule and Routing with r_s =(104)= with (p=-0.077, p=0.434).

The correlation analysis of this study shows that there is statistically significant and negative relationship between logistics performance and fleet management practices (Vehicle Repair Management, Fuel Management, Driver Management and Vehicle Schedule and Routing.

4.4. Discussion

In this study, four variables were identified to describe the effect of fleet management on logistics performance at DJLMDTD; these are vehicle repair management, fuel management, driver training & management and vehicle schedule and routing. On the other hand, logistics performance was measured in terms of safety, operational cost and time. In addition, the research showed the DJLMDTD complete missions by not keeping a time and there could be a delay in time due to convoy procedures in doing so the cost of transportation is also increases and the trend in using a cost benefit analysis is not adequate. The research covered that, among the four independent variables, vehicle repair management have a positive and significant effect on logistics performance whereas, fuel management, driver training & management and vehicle schedule and routing have a negative significant effect on logistics performance at DJLMDTD.

This research described that, among the four fleet management practices; fuel management, driver training and management and vehicle schedule and routing have a negative and significant relationship with the logistics performance of DJLMDTD. Vehicle repair and maintenance management on the other hand, has a positive significant effect on logistics performance in DJLMDTD.

CHAPTER FIVE

5. CONCLUSIONS AND RECOMMENDATIONS

5.1. Introduction

In this chapter, the study put the main findings, conclusions, recommendations in perspective. Based on the data presented and analyzed in chapter four of the study, the following conclusion and recommendations were drawn.

5.2. Findings

One hundred six of the total sampled responded, giving an acceptable response rate of 78.5%. All the questionnaires were edited and checked for completeness for use in the data analysis. The data collected was based on the key variables crucial in evaluation of the effect of fleet management practices on logistics performance to the department under study.

The findings on fleet management practices at DJMDTD shows that delay in vehicle repair and maintenance and the control system for repair and maintenance is poor, whereas, the fuel management practice is good in the department which is also controlled by independent fuel controller. The fuel management practice is good in DJLMDTD since the fuel is supplied by a capable supplier of fuel in a non-continuous manner by entering a three years contractual agreement, the facility is built by the supplier across the country even at the premises of defense forces.

In regard to driver management problems, most of the problem occurred by undisciplined drivers and operators. Training is given to drivers and operators once in a year but the turnout of employers is high so that it is not enough.

The vehicle schedule and routing of the transport department has limitations in preparing a planning out time for deliveries and who will made but the fleet manager randomly pick a driver and assign to the task and there is no a mapping specific routes for drivers. Moreover, route plans are not compared to the actual performance in the department.

The result for logistics performance which is measured in safety time and cost indicates that there exists a delay in time in completion of mission. The department is not using the cost benefit analysis properly and the cost of logistics is high. The transport service given by

DJLMDTD goes not in line with end users' satisfaction which is not only occurred by fault of the department but also the end user's readiness to unloading in time is a problem.

In regard to safety there is no a written safety policy in DJLMDTD, the theory suggests organizations to have a written document of a safety policy having all the responsibilities to drivers but this is not practicable and during accidents settlement is made by insurance following procedures.

Above all, the variables fuel management, driver management, vehicle schedule and routing having a significant negative association with logistics performance. However, vehicle repair management have a significant positive relation in predicting the power of logistics performance even if there are some kinds of association between fuel management, driver management and vehicle schedule and routing implies that these factors played a vital role in maintaining strong logistics performance.

Among fleet management practices vehicle repair and maintenance management practice have a great effect on logistics performance whereas, driver training management, fuel management and vehicle schedule and routing have little effect on logistics performance.

Furthermore, the vehicles acquired and administered by DJLMDTD specially the Volvo high bed trucks are suitable for GPS, the technology fitted to the trucks is the best one but the department still do not use the GPS for tracking the vehicles and the department manages manually using different paper formats and in tracking the vehicles they use telephone and SMS services. Most of the employees were ready to use the information technology for fleet management system, the transport department is on the way to build the IT center and assign a professional but still it is not functional.

5.3. Conclusions

Relying on the results of the study and the summary of findings, the study concludes that among fleet management practices vehicle repair and maintenance management have the largest effect on logistics performance, next is driver training management have effect on logistics performance, fuel management have the less effect and in moderate condition on logistics performance and vehicle schedule and routing have the least effect on logistics performance in DJLMDTD.

Hence the DJLMDTD should give a prior attention to the vehicle and repair maintenance management. The transport department is still on process to organize its own IT center

besides the employees use computers for day-to-day operation. The DJLMDTD fleet management system cannot track vehicles at any location quickly because they still not install the GPS even though the Volvo trucks are suitable for the technology GPS is not applied and installed for the trucks for security reason.

The DJLMDTD encounter errors while working manually and the fleets are ordered in convoys and have its own discipline the speed of the trucks is limited for security reason and in doing so affects the military operation logistic supply for EDF who were deployed in Tigray.

Hence, the DJLMDTD is expected to enhance its fleet management practices to gain better logistics performance.

5.4. Recommendations

By confirming the study results, the researcher recommends the following points as sound recommendations to the problem as follows.

- ✓ The vehicles acquired and administered by DJLMDTD specially the Volvo high bed trucks are suitable for GPS, in order to adapt the better fleet management, it is better to use the GPS in which it helps in tracking the vehicles.
- ✓ The DJLMDTD should organize the information technology IT center as fast as possible for fleet management system to be effective.
- ✓ To improve the military logistic supply of DJLMDTD, the maintenance garage should complete the service and maintenance of vehicles and equipment on time.
- ✓ The DJLMDTD should install a vehicle tracking system on all its vehicles and equipment to catch real-time information to monitor fleets.
- ✓ To motivate and enhance the efficiency of Driver/ operators, the DJLMDTD should set and implement development and there is need for regular driver training.
- ✓ For improvement and inspiration of drivers and operators the DJLMDTD enterprise should have successful performance evaluation system
- ✓ The department should set a system and develop a habit to motivate/reward an exemplary driver/operator, in succeeding the aim of driver training and management system.

- ✓ The DJLMDTD should adopt a written safety policy which are signed and enforced by upper management.
- ✓ The transport department should take disciplinary measures including termination, in case of non-compliance with the safety policies.

5.5. Limitation and suggestion for future research

Even though this research paper was subjected to different literatures and data analysis tools and using triangulation, it has its own limitations and should be mentioned in order to pave the way for further studies. The first limitation of this study is generalizations of findings, since the study was limited to single defense transport department, the finding of the study may not be applicable to other organizations. The second limitation is because of time and resource constraint this study is limited on the effect of fleet management practices on logistics performance only. Another limitation is that DJLMDTD performance might be affected not only by fleet management practice, but also by various other variables not considered in this study. In carrying out this study significant constraint was the number of samples, inadequate literatures or secondary source accessibility on fleet management practices. Finally, this study may need further testing because this study was restricted to DJLMDTD.

References

Babbie, E., 1990. The essential wisdom of sociology. Teaching Sociology, 18(4), pp.526-530.Babbie, E.(1990). ‘’Survey Research Methods.California.Wadsworth’’.

BAYABLE, M.M., 2020. THE INFLUENCE OF FLEET MANAGEMENT PRACTICES ON CONSTRUCTION PERFORMANCE: THE CASE OF AWWCE.

Bryman, D. (2004). ’Research Methodology’’ 2nd edition, London, England: Strong Publication Centre. Anisimovsky, V.V‘., Artamonov, A.V., Bassalleck, B., Bhuyan, B., Blackmore, E.W., Bryman, D.A., Chen, S., Ch iang, I.H., Christidi, I.A., Cooper, P.S.

Bryman, D. (2004). ’Research Methodology’’ 2nd edition, London, England: Strong Publication Centre.

C.J., Keller, J.J., Zoetendal, E.G. and De Vos, W.M., 2014. Reset of a critically disturbed microbial ecosystem: faecal transplant in recurrent Clostridium difficile infection. The ISME journal,

Choudhary, A.I., Akhtar, S.A. and Zaheer, A., 2013. Impact of transformational and servant leadership on organizational performance: A comparative analysis. Journal of business ethics, 116(2), pp.433-440.

Christopher, M. and Holweg, M., 2011. “Supply Chain 2.0”: Managing supply chains in the era of turbulence. International journal of physical distribution & logistics management.

Cova, T.J. and Conger, S., 2004. Transportation Hazards–in Handbook of Transportation Engineering, M. Kutz.Donald, 2002.

Coyle, J.J., Novack, R.A., Gibson, B.J. and Bardi, E.J., 2011. Transportation: a supply chain perspective. South-Western Cengage Learning

Della-Giustina, D.E., 2012. Motor Fleet Safety and Security Management. CRC Press.

Diwan, M.V., 2004. Improved Measurement of the $K+\rightarrow \pi+ \nu \bar{\nu}$ Branching Ratio. Physical review letters, 93(3), p.031801.

Drossos, D., Giaglis, G.M., Lekakos, G., Kokkinaki, F. and Stavraki, M.G., 2007. Determinants of effective SMS advertising: An experimental study. *Journal of Interactive advertising*, *7*(2), pp.16-27.

DJLMDTD 2020-(2020-2021) Annual report

Haksever, C., Render, B., Russell, R.S. and Murdick, R.G., 2000. Service management and operations. Pearson College Division.

Keith E. Bonn and Anthony E. Baker,(2000).‘’Guide to military operations other than war’’ Library of Congress Cataloging-in-Publication Data Fuentes, S., Van Nood, E., Tims, S., Heikamp-de Jong, I., Ter Braak,

KELLER, J., 2014. FLEET MANAGEMENT PRO. Wisconsin: J.J Keller & Associates, Inc..

Kolman, D., 2010. Business management. *Fleet Maintenance. June*, pp.8-9.

Kothari, D.P. and Nagrath, I.J., 2003. Modern power system analysis. Tata McGraw-Hill Education.

Kress, M., 2002. Operational logistics. The Art and Science of Sustaining Military Operations.M weyn, F. S., n.d. 2008.

Levina, V., Marrangoni, A., Wang, T., Parikh, S., Su, Y., Herberman, R., Lokshin, A. and Gorelik, E., 2010. Elimination of human lung cancer stem cells through targeting of the stem cell factor–c-kit autocrine signaling loop. Cancer research,

Louis, C., Keith, M. and Lawrence, M., 2000. Research methods in education 5th edition. New York.

Mebratu, H.B., 2014. Assessment of Planning and Implementation of Transportation Service Delivery in the Ethiopian Armed Forces of Bure Front ersity).

MIHRETU, G.G., 2019. THE EFFECT OF TRANSPORT MANAGEMENT PRACTICE ON LOGISTICS PERFORMANCE

Mugenda, O., 2003. &Mugenda A.(2003). Research methods: quantitative and qualitative approaches.

Otieno, G.O. and Noor, I.S., 2014. Factors affecting logistic support in military operations: Case of the Kenya Defence Forces. International Academic Journal of Procurement and Supply Chain Management, 1(3), UNHCR, 2016.

Omoke, V., Nwaogbe, O.R., Pius, A., Ayam, S.M. and Hemli, H.A., Analytical Study of Fleet Management and Vehicle Replacement Model: Evidence from the Nigerian National Petroleum Co-operation Headquarter Abuja. vol, 2, pp.1-19.

Powell, W.B. and Topaloglu, H., 2005. Fleet management. In Applications of stochastic programming (pp. 185-215). Society for Industrial and Applied Mathematics.

Rahim, A.H.A., Rashid, N.A., Nayan, A. and Ahmad, A.R., 2019. Smote approach to imbalanced dataset in logistic regression analysis. In *Proceedings of the Third International Conference on Computing, Mathematics and Statistics (iCMS2017)* (pp. 429-433). Springer, Singapore.

Rushton, A., Monck, E., Leese, M., McCrone, P. and Sharac, J., 2010. Enhancing adoptive parenting: A randomized controlled trial. Clinical Child Psychology and Psychiatry, 15(4),

Singh, B., Singh, B.N., Chandra, A., Al-Haddad, K., Pandey, A. and Kothari, D.P., 2003. A review of single-phase improved power quality AC-DC converters. IEEE Transactions on industrial electronics,

Shafi, K., B[ender, A. and Abbass, H.A., 2011, July. Fleet estimation for defence logistics using a multi-objective learning classifier system. In Proceedings of the 13th annual conference on Genetic and evolutionary computation (pp. 1195-1202).

Vivaldini, M., Pires, S.R. and Souza, F.B.D., 2012. Improving logistics services through the technology used in fleet management. *JISTEM-Journal of Information Systems and Technology Management*, *9*, pp.541-562.

weyn, 2008. s.l.:s.n. De Poorter, E., Hoebeke, J., Strobbe, M., Moerman, I., Latré, S., Weyn, M., Lannoo, B. and Famaey, J., 2017. Sub-GHz LPWAN network coexistence, management and virtualization: an overview and open research challenges. Wireless Personal Communications, 95(1),.

Yemane, M., 1967. Elemantary Sampling Theory, Printice-Hall Inc. Englewood Cliffs, New Jersey, USA.

Zeimpekis, V.S., Tarantilis, C.D., Giaglis, G.M. and Minis, I.E. eds., 2007. Dynamic fleet management: concepts, systems, algorithms & case studies (Vol. 38). Springer Science & Business Media.

.

APPENDIX- I:

Questionnaires

Addis Ababa University School of Commerce Master of Art in Logistics and Supply Chain Management Questionnaries on " The effect of Fleet Management Practices on Logistics Performance: The Case of Defense Joint Logistics Main Department Transport Department"

Dear respondent:

I thank you in advance for your cooperation in answering the following questions. The main theme of collecting information through this questionnaire is to conduct research on " The effect of fleet management practices on logistics performance: the case of Defense Joint Logistics Main Department Transport Department" for my partial fullfillment of MA degree in logistics and supply chain management. The data to be collected will help me to asses the impact of fleet management on military operatioons performance and to recommend solutions that could improve the transportation facility in combat operations in defense joint logistics main department.

Therefore, you are kindly requested to respond to each item accurately for the research outcome to be complete, reliable. I hereby inform and assure you that, the information you provide me will kept confidential and shall only be used for academic purpose.

Please note that:

- You do not need to write your name on the questionnaire,
- You are expected to respond for all the research questions,
- Put a (✓) mark inside the box provided next to each questioner or write your comments when needed,
- You can put a (✓) mark on more than one option,
- The questionnaire will take approximately 15 minutes of your time.

Thank you for your cooperation!

By; Zelalem Getahun (0911 768934 or 0915 532589)

Advisor; Busha Temesgen (Ph.D)

General Information

1. Sex; Male □ Female □
2. What is your current educational status?

   PhD□ MA/MSc degree □ BA/BSc degree □

Diploma (TVET) (12+2) □ Grade12 complete and certificate (12+1)□

Below Grade 12 □

3. Occupation; Administration□ Auto Mechanic □ Driver □ other □
4. Service year in the organization

   More than 10 years □ 5 to 10 years □ 2 to 5 years □

   Less than 2 years □
5. **Age;** 18 - 30 □, 31- 45 □, 46 - 55□, 56 & above □

Please indicate the degree of agreement or disagreement with the following statements by ticking against the best alternative.

No	Descriptiom					
	5=strongly agree, 4= agree, 3=neutral, 2=disagree and 1= strongly disagree	**1**	**2**	**3**	**4**	**5**
VRM	**Vehicles Repair and Maintenance management**					
1	The control system of DJLMDTD for vehicle repair and maintenance is successful,					
2	The DJLMDTD has a controlling mechanism for genuine spare parts used for vehicle maintenance.					
3	The DJLMDTD has professional fleet manager and maintenance supervisor,					
4	The repair and maintenance (refer garage) complete the service on time.					
5	Drivers/operators of the DJLMDTD gives feedback for fleet department about service and maintenance of the assigned vehicle.					
FM	**Fuel Management**					
1	The DJLMDTD adopts a good fuel management system.					
2	The DJLMDTD provides sufficient fuel supply for military operations.					
3	The transport department has a timely follow up for fuel consumption.					
4	The DJLMDTD has a potential fuel supplier all over the country.					
5	The DJLMDTD has an independent fuel controller.					
DM	**Driver Training Management**	**1**	**2**	**3**	**4**	**5**
1	The DJLMDTD has well organized supervision method on drivers/operators.					

2	The DJLMDTD is effective on assigning mission to drivers/operators.					
3	The DJLMDTD has built a communication system with drivers/operators.					
4	The DJLMDTD facilitate to give training to drivers/operators.					
5	The DJLMDTD motivate disciplined drivers/operators by giving a reward.					
VSR	**Vehicle Schedule and Routing**	**1**	**2**	**3**	**4**	**5**
1	The DJLMDTD develop a planning out time window for when deliveries will be made and who will make them.					
2	The DJLMDTD develop a mapping specific route that drivers will take to make deliveries.					
3	The DJLMDTD has a method of tracking current hours-of-service information on all drivers, and the information is checked prior to each dispatch.					
4	In the DJLMDTD Route plans are compared to actual performance to verify compliance.					
LP	**Logistics Performance**					
1	The DJLMDTD complete missions on time.					
2	The DJLMDTD use a cost benefit analysis.					
3	The DJLMDTD perform a transport service goes in line with end users satisfaction.					
4	The DJLMDTD has safety policies which are signed and enforced by upper management.					
5	The safety policies are reviewed and updated on a scheduled basis.					
6	There are disciplinary measures including termination, in case of noncompliance with the safety policies.					

APPENDIX- II:

Interview Guideline

Addis Ababa University School of Commerce Master of Art in Logistics and Supply Chain Management a semi structured interview on "The Effect of Fleet Management Practices on Logistics Performance: The Case of Defense Joint Logistics Main Department Transport Department"

It includes the selected military personnel which contains and take into account all military rank holders and military commanders through semi structured interview of defense joint logistics main department.

The questionnaire will take approximately maximum 30 minutes. I guarantee that all of your answers will be completely confidential.

***Thank you for taking your time and willingness to cooperate*.**

By; Zelalem Getahun (0911 768934 or 0915 532589)

Advisor; Busha Temesgen (PhD)

1. Semi structured interview questions to middle level and high-level managers of defense joint logistics main department transport department.

Discussion Points

Background

 Name

 Educational level

 Occupation status to this organization

1. What is the effect of fleet management practices on logistics performance at defense joint logistics main department transport department?
2. What are the main challenges of fleet management practices in DJLMDTD?
3. Who planned the resources to allocate including military vehicles?
4. Are there any standards operating procedure or benchmarks used in ensuring the transport service delivery on military operation logistic supply?
5. Do you think drivers and commanders professionally competent in performing fleet management practices?
6. What possible recommendations do you forward to alleviate the effect of fleet management practices on logistics performance?