

FLEET MANAGEMENT STRATEGIES AND PROFITABILITY OF TRANSPORT COMPANIES IN KENYA: A CASE STUDY OF MOTREX LIMITED

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ABSTRACT

This study aimed to evaluate the effect of fleet management strategies on the profitability of transport companies in Kenya, focusing on a case study of Motrex Limited. Aimed to determine the effect of intelligent fleet management systems, and vehicle financing, on the profitability of Motrex Limited, Kenya. This study was anchored on the Resource-Based View Theory. The survey utilized a descriptive research design for the investigation. The target population of 1,102 employees. A stratified sampling technique was deployed. To determine the sample size, the study employed Yamane's formula with a 95% confidence level. The sample size of the study was 400 respondents. A closed questionnaire was used to gather the study's initial data. The effect of Intelligent Fleet Management Systems on the operational performance of Motrex Kenya Limited's transport business was ascertained using a regression model. Descriptive statistics, such as standard deviations, means, frequencies, and percentages, were employed to analyze the quantitative data. Additionally, inferential statistics such as multiple linear regression and correlation analysis were performed to establish the relationship between the study variables using SPSS version 26. From the study findings, it was revealed that the R square value was determined to be 0.723 indicating the proportion of the variance in the dependent variable that is predictable from the independent variable(s). An R^2 of 0.723 implies that approximately 72.3% of the variance in the profitability of Motrex Limited can be explained by the model. This value measures the strength and direction of the linear relationship between the variables. An R value of 0.834 suggests a strong positive correlation between the dependent and independent variables. It is recommended that Motrex Kenya Limited and similar players in the transport industry. By doing so, the company can further reduce financial losses associated with accidents and maintenance issues while promoting safer driving habits among its drivers.

Keywords: Fleet Management Strategies, Profitability of Transport Companies, Intelligent Fleet Management Systems, Vehicle Financing

BACKGROUND OF THE STUDY

Planning, arranging, and managing every facet of a fleet of automobiles owned and controlled by a transportation firm, the government, or another entity is known as fleet management, (Imbuga et.al, 2018). Imbuga et.al, (2018) suggest that in order to be profitable in the market, winning organizations should have fleets that are dependable, effective, timely, and adaptable. The management team faces a formidable task in organizing, planning, and coordinating the available resources in a way that would provide the transport company a competitive edge while staying within budget. Kenya transport sector has been facing and still faces a lot of challenges ranging

from uncertainty in legislation, heavy taxation and penalties in case of non-compliance, cut throat competition, rising input costs just to name a few. This has posed a big dilemma to many transport players on how to stay competitive and remain in business, (Ali, 2018).

Many transport empires have either closed the businesses, scaled down operations or put under receivership. For example big players Buzeki Group Limited, Kisii Express, Transline, Modern Coast and MCBH Hauliers to name a few have either closed operations, or scaled down. To add my lens to this, Veecom Ventures Ltd, although a small company, a transport company which I started in 2016 had to scale down operations from 10 trucks, 25 employees to just 3 trucks with 6 employees due to the challenges in this sector. This motivated the choice of this research project. In light of these challenges faced transport players need to come up with strategies to remain relevant. One of the strategies is how to be profitable. It is my view that intelligent fleet management strategies can influence profitability and this explains the choice of my research topic. With the foregoing the study will look at profitability by examining the connection between intelligent fleet management systems, and vehicle financing, and how these factors affect profitability, (Aflabo et.al, 2020).

Profitability

The profitability of transport companies in Kenya is a critical aspect of the nation's economic landscape, influenced by various factors including operational efficiency, fleet management strategies, and market demand, (Kuria & Ndirangu, 2021). Effective fleet management strategies such as the adoption of intelligent fleet management systems, vehicle financing, and the integration of information and communications technology (ICT) have the potential to significantly enhance profitability. These strategies can lead to reduced operational costs, improved vehicle utilization, and better compliance with regulatory requirements, thereby increasing overall efficiency and profitability. According to Kimani (2019), transport companies that leverage these advanced fleet management practices are better positioned to optimize their operations, reduce downtime, and improve customer satisfaction, which collectively contributes to higher profit margins. However, challenges such as fluctuating fuel prices, inadequate infrastructure, and regulatory hurdles continue to impact the profitability of transport companies, necessitating continuous innovation and adaptation in fleet management practices.

Intelligent Fleet Management System

According to Jozczuk–Januszewska (2015), an Intelligent Fleet Management System (IFMS) is a business-level internet software application (EAS) that links departments and locations to manage the daily logistical tasks of an organization. The management information system (MIS) reports provided by the program are customized with the workflow to administrate everyday activities and allow for sensible control and decision-making. It generates unlimited functionalities for all users to categorize, operate, communicate, engage, browse, store, grow, and interface. It also provides very easy-to-use menu-driven actions, making it simple for users to access, read, and change the data. Jozczuk–Januszewska, (2015) went ahead to state that an IFMS supports all aspects of logistics management, involving, but not restricted to, the administration and synchronization of diverse assignments including inventory replenishment, fleet scheduling, and stream of arrangements.

Transportation businesses must address several issues, such as cost-cutting, increasing stakeholder

compliance with corporate communications, and enhancing consumer happiness, (Cooper, Lambert & Pagh, 2017). The IFMS, which aid businesses in realizing efficiency and profitability, are the ideal tool for addressing these issues. According to Hidalgo and Hausmann (2019), the current knowledge-driven economy and its uncertain and constantly changing environment imply that the current situation will present obstacles for carriers to overcome to guarantee greater operational performance. A key factor driving the adoption of new technology and breakthroughs is the intensifying market competitiveness. As businesses look for ways to cut expenses through increased operational effectiveness or the creation of new value. The effective management of fleet operations can be stated to be related to higher productivity, more operational effectiveness, and better customer service.

Effect of Vehicle Financing

Fleet managers should not only look at the purchase price of a vehicle but also consider the total cost of ownership, which includes the costs incurred during the ownership of the vehicle, (Lebeau et. al., 2016). The type of vehicle and the annual mileage all determine the maintenance costs incurred such as brake replacement, oil replacement, etc. but are required to keep the vehicle operable. According to Robinson (2015), maintenance costs increase over the lifetime of the vehicle with the greatest increases occurring in the first and seventh years of the asset. Therefore, the best time to get rid of an asset would be about the seventh year of service since the vehicle retains some of its original value. The transportation sector in Kenya plays a vital role in the country's economy by enabling the transportation of products and individuals across different areas. Efficient fleet management solutions are crucial for improving the profitability of transportation companies in this ever-changing industry. Fleet management involves a variety of strategies aimed at maximizing the utilization, upkeep, and effectiveness of vehicles in a company's fleet. These activities encompass vehicle procurement, scheduling maintenance, managing fuel consumption, overseeing drivers, and planning routes. All of these tasks have a direct influence on operational expenses and the quality of service provided, (Edwards, 2018).

The transport industry in Kenya encounters various obstacles, such as exorbitant operational expenses, volatile fuel prices, and rigorous regulatory demands. Kariuki, (2020) argue that the implementation of sophisticated fleet management systems has played a crucial role in addressing these difficulties. These systems utilize advanced technology like GPS tracking, telematics, and data analytics to offer up-to-the-minute data on the whereabouts of vehicles, their performance, and the conduct of drivers. By closely monitoring these metrics, firms have the power to decrease fuel consumption, minimize excessive vehicle usage, and enhance total fleet utilization, ultimately leading to improved profitability, (Kiplagat, 2020). Effective maintenance management is a crucial component of fleet management that has a substantial impact on profitability. Performing routine maintenance on vehicles guarantees that they stay in their best possible state, minimizing the chances of malfunctions and prolonging the lifespan of the entire fleet. Krysiak (2022) highlights that implementing a proactive maintenance strategy not only reduces repair expenses but also improves safety and reliability, both of which are essential for upholding customer happiness and confidence. In addition, properly maintained vehicles help to decrease fuel consumption and minimize emissions, which is in line with sustainable business practices, (Mwangi et.al, 2019).

Statement of the Problem

Transport businesses are under pressure to be dependable, transport goods more quickly, and provide services at reasonable prices. As a result, their firms now require an Intelligent Fleet Management System, (Krysiak, 2022). IFMS assists in reducing fuel and reduce the cost of vehicles and enhance employee welfare. Utilizing ICT enhances tracking multiple parameters instantly, including speed, data field and position in order to identify delivery bottlenecks and reduce operating costs. Strong fleet management is made possible by the use of ICT providing logistical support that guarantees the efficacy and efficiency of transport procedures. A strong Intelligent Fleet Management System would guarantee that transportation businesses achieve operational success by lowering transportation costs, streamlining business operations, and enhancing effective service to all the customers, (Said et al., 2014). In as much there exist all these advantages of Intelligent Fleet Management System, there hasn't been a notable decrease in operating costs or overall efficiency in the operations of transport companies. Additionally, the transportation sector's contribution to GDP has not increased to a greater degree. The extent to which ICT-based fleet management might assist transport businesses cut costs, boost efficiency, and generally perform better operationally must be evaluated.

Between 5 and 15% of Kenya's GDP is contributed by the transport sector (GDP). However, transport has a greater influence than its economic engagement because it acts as a linkman and provides services for all areas, making it essential to both economic progress and comfort. As a result, the trimester provides the community with adequate, proper and appropriate services. The company provides these provisions to the community at very affordable cost while ensuring that no adverse effects would be felt by the neighbourhood or its surroundings, (UNCTAD, 2017). Therefore, transportation businesses face new obstacles that call for constant monitoring, cost-saving strategies, on-time delivery, and contingency planning for any potential issues. The emphasis is on IFMS reducing operational expenses and improving fleet management, (Nelson, 2020).

There have been numerous studies on fleet management and operational effectiveness. A study by Urciuoli, (2020) on the use of fleet management technology to enhance logistics services was carried out in Brazil. It was discovered that fleet management helps to increase services and to smooth information so that responses to client needs may be made quickly. Hu et.al, (2020) carried out a study on automatic vehicle management to enhance operational performance. They discovered that automatic vehicle management had enhanced fleet safety while also lowering costs and increasing dependability. The efficiency of a contemporary IFMS was examined by Waiyaki's (2016) to improve KPLC's internal resource movement logistics. It was determined that IFMS improved data management system for a good resolution process, decreased operational expenses, made a range of fleets available, and decreased accidents. The study, however, was predicated on KPLC protocols.

The global fleet management market will grow up to an estimated \$28.66 billion by the end of 2022 (Ben Othmane et. al., 2018). According to Xu et. al., (2019) the market is ever demanding a more reliable, efficient, punctual, and flexible logistics and transportation sector. The challenge to meet all those requirements pushes for efficient fleet management practices and strategies. According to Matyszczyk (2015), researchers are publishing papers at such a high rate that it is hard to keep up with the volume of information available to the extent that new papers are forgotten

very quickly. Ali (2018), for instance, aimed to determine how an Intelligent Fleet Management System affected Mombasa's transport companies' operational performance. However, Maina (2017) noted that the adoption of suitable fleet management techniques could assist in reducing transportation expenses for the public sector. Though there are several studies carried out in regard to fleet management, there are some research gaps that need to be covered in regard to fleet management strategies for transport companies in Kenya. This study therefore, sought to contribute to this area of study by evaluating the effect of fleet management strategies on profitability of transport companies in Kenya.

Objectives

- i. To assess the effect of intelligent fleet management system on profitability of Motrex Limited, Kenya.
- ii. To investigate the effect of vehicle financing and maintenance on profitability of Motrex Limited, Kenya.

LITERATURE REVIEW

Theoretical Literature Review

The Resource Based View Theory was the anchoring theory, Technology Diffusion Theory, and Theory of Replacement serve as the foundation for this investigation.

Resource-Based View

Resources have a major role in a firm's capacity to maintain its competitive advantage. The Resource-Based View (RBV) holds that a company's performance is based on the resources at its disposal. The way these resources are used and set up gives the company performance and a clear competitive edge. They belong in one of two categories: tangible or intangible. Land, buildings, machinery, equipment, and capital are examples of the tangible. Trademarks, intellectual property, and brand reputation are examples of intangible assets that are commonly cited as the primary source of competitive advantage. Wernerfelt (1984) created the hypothesis originally, and Rumelt advanced it subsequently (1984). The argument holds that businesses shouldn't outsource their key competencies or those requiring specialized knowledge. The comparison of an organization's skills to those of the marketplace is stressed.

The organization and its assets then need to take a position. The idea states that companies should use their strategy to choose where in the market to allocate their resources. The resources, capabilities, and unique operating style that a company has access to determine its operational performance, according to the firm's RBV, (Barney, 1991). By recognizing and managing internal strategic resources, businesses may create and sustain operational success, claim Crook, Ketchen, Todd, and Combs (2008). However, the RBV is critiqued in a variety of ways. The hypothesis, it is said, is only practicable whenever demand level is examined and is sufficient, (Priem & Butler, 2001).

Bower and Christensen (1995) challenge the hypothesis by highlighting that several successful innovational businesses fail to foresee the effects that upcoming modifications' effects on the present ICT users. If a product needs extensive marketing in order for buyers to understand that the new ways can be compared to product taste to the old one, it can make launching extreme new

items very challenging. Some technologies may never completely replace well-liked devices because they have not yet reached their target market.

Nevertheless, ICT serves as a strategic asset. Through improvement of the company's ability to provide a specific and individualized experience and by lowering order processing errors and response times, it offers administrators an advantage and guarantees accuracy in the clients' pleasure, (Borges, Hoppen & Luce, 2009). Technologies used before, during, and after transactions that make information processing and purchasing easier provide more insightful input on what customers require. Businesses can and ought to integrate artificial intelligence into their product lineup to increase competitiveness. It helps a company stand out from competitors and improves customer utility, which leads to market advantages, (Gibson, Edward & Eggra, 2018). Technology makes ensuring that the business attunes to high operational efficiency and that it maintains this efficacy throughout the market's direction. It also makes it easier to stay in touch with clients while avoiding conflict with rivals and ensuring that newly learned skills and insights are quickly applied to guide business operations, (Dunkle Werner, 2016).

In relation to this study, the Resource-Based View (RBV) of the firm provides a useful theoretical framework for understanding how fleet management strategies can affect the profitability of transport companies such as Motrex Limited in Kenya. By examining both tangible and intangible resources and their strategic deployment. In essence, Tangible resources such as the fleet of vehicles, maintenance facilities, and technological equipment are crucial for Motrex Limited. The According to Johnson (2018), innovations can be any new idea, product, technology, or practice that is introduced to a group of people or a society. They can range from simple everyday tools to complex technologies or novel ideas. Adoption on the other hand refers to the process by which individuals or groups decide to use or accept an innovation. Adoption can be influenced by various factors, including perceived advantages, compatibility with existing practices, and ease of use.

The theory further highlights that there is an end point in the actual system where users can easily adopt technological usage with a right intention in behavior. Besides, the author highlights that Technology Acceptance Theory is founded on three major perspectives, including values and usage, describing the users can find it easy to interact with the newly adopted technology or computerized systems. The Technology Acceptance Theory is also based on the users' attitude toward the freshly adopted systems and how they influence overall performance, (Johnson, 2018).

According to Gitahi and Ogollah (2014), the Technology Diffusion Theory suggests that the person who makes the decision to adopt a particular innovation may not necessarily be the one who ultimately benefits from it. This individual is typically exposed to new products, technologies, and information about innovations. It's becoming evident that the person who initiates or authorizes an innovation within an organization doesn't always experience the direct benefits of that decision. This theory states that although car owners are not directly involved in the daily upkeep of their vehicles, they are ultimately responsible for selecting the fleet types that will best assist their overall operational endeavors. Operational aspects, such as managing the fleet, supervising drivers, and maintaining the vehicles, are overseen by key individuals at the operational level, (Gitahi and Ogollah, 2014). For example, independent manufacturers (innovators) produce vehicle tracking devices, but its third parties who use these devices to monitor and track their fleet of vehicles.

In relation to this study, The Technology Diffusion Theory provides a valuable framework for understanding the adoption of information and communications technology (ICT) in fleet management and its impact on the profitability of Motrex Limited in Kenya. By examining how innovations are introduced, adopted, and diffused through an organization, we can apply the principles of TDT to analyze the relationship between ICT adoption and organizational performance at Motrex Limited. Innovations in ICT, such as GPS tracking, telematics, and fleet management software, represent new ideas and technologies that can significantly enhance fleet operations. According to Johnson (2018), the adoption of these innovations is influenced by perceived advantages, compatibility with existing practices, and ease of use. For Motrex Limited, adopting these ICT innovations can lead to improved efficiency, reduced operational costs, and enhanced profitability. For Motrex Limited, achieving this endpoint means that all stakeholders, from drivers to fleet managers, effectively use ICT tools to optimize fleet operations, leading to better decision-making and increased profitability.

Theory of Replacement

The Theory of Replacement, also known as the Replacement Cost Theory, was formulated by John Burr Williams in 1938. This theory states that the value of an asset is determined by the cost of replacing it with an identical or similar asset, adjusted for factors such as depreciation and obsolescence. Williams introduced this theory in his book "The Theory of Investment Value." The Theory of Replacement addresses the optimal life of capital equipment. An asset's optimal life is the period of time between when it first begins to give services and when it needs to be restored in order to be used again. In the management of capital assets, including fleet, an ideal life and restoration policy is essential, (Hilten, 1991).

A capital investment's operating expense often increases as it deteriorates over time. The cost of investing in new equipment eventually becomes less expensive than that of outdated equipment. This outlines the foundation of an efficient IFMS. The replacement evaluation typically analyzes trends in operating expenses as well as the final of replacement, or the difference between the cost of advanced equipment and the remaining equipment, (Rust, 1987). In other cases, replacement appraisal also considered how much money the equipment would bring in at various levels of its life importance, (Bamford, 2017).

The theory of replacement's detractors contends that the models for replacing vehicles require a variety of historical and predicted data detailing the operation and components of fleets. The majority of businesses face this difficulty constantly, especially in emerging nations, (Nakagawa, 1984). Therefore, this information needs to be gathered, revised, and handled with the use of a contemporary database. Since most businesses can never really afford to buy cars, they frequently find it difficult to adjust to fluctuations in the amount of money needed for fleet replacement.

A number of factors influence replacement decision-making. A new technology could boost output or save expenses. Thus, according to the theory, in order to produce precise estimates of future organizational capital and operating costs, an administrator must make enhancements in equipment design, equipment efficiency, and human capital or labour and financial capital considerations into account, (Gregory, 2021). The concept helps define fleet management's optimal replacement strategies for company vehicles. The economic theory of fleet replacement is based on this idea,

which suggests that cars should be replaced when their operating costs and total cost of ownership are at their lowest points in the past. The theory states that freight transportation companies can minimize costs and improve the economic and technical conditions of their fleet by defining the best replacement policies for their ageing fleet through the use of an efficient fleet replacement technique.

Empirical Literature Review

The relationship between various fleet management strategies and techniques and profitability has been the subject of numerous studies.

Intelligent Fleet Management Systems and Profitability

Intelligent Fleet Management Systems (IFMS) have gained significant attention in the transportation and logistics industry due to their potential to enhance profitability through improved efficiency, cost reduction, and enhanced decision-making capabilities. Numerous researches have examined the connection between profitability and IFMS in the literature. A study by Vivaldini et al., (2022) examined how fleet management may use technology to improve logistical services. The findings show that logistics service providers are working to expand their offerings and organize their data in order to quickly address client requests. It also confirms that this logistics service provider's use of the FMS in conjunction with the existing technology has become one of its defining characteristics. Important knowledge and their abilities have increased for organizations.

Brar and Sur (2020) conducted a study on ensuring Service Fairness in Taxi Fleet Management in Berlin. One key aspect highlighted in the literature is the role of IFMS in optimizing route planning and vehicle allocation. It was determined the study that by leveraging real-time data on traffic conditions, weather, and vehicle performance, these systems can help companies reduce fuel consumption and maintenance costs. This optimization leads to shorter delivery times and increased customer satisfaction, ultimately driving profitability. Additionally, it was established by Ciociola et al., (2023) that IFMS offers substantial benefits in terms of vehicle monitoring and maintenance. Studies have shown that real-time monitoring of vehicle health and performance can lead to reduced breakdowns and downtime, resulting in lower repair costs and increased fleet utilization. This proactive maintenance approach contributes directly to profitability by minimizing unexpected expenses.

Furthermore, a research by Kamandanipour et al., (2023) which was carried out to assess a passenger rail network with price and fleet management decisions, dynamic revenue management had significant outcome. The study established that IFMS enables better driver management and safety practices. Many studies have demonstrated that these systems can track driver behavior, promoting safer driving habits, and reducing accidents and associated costs. Safer driving not only safeguards a company's reputation but also helps lower insurance premiums, directly impacting profitability. According to Niesten & Alkemade (2016), enhanced tracking and monitoring capabilities enable better control over inventory levels and reduce the risk of stockouts or overstock situations. Improved supply chain visibility facilitates accurate demand forecasting, reducing carrying costs and enhancing profitability.

A research on enhancing operational performance using automatic vehicle management was carried out by Orr and Kempter (2019). The investigation discovered that the placement of the automated car management system has shown to be beneficial. It has made provision for improved management of the company's significant capital investments, including its fleet and human resources. While fewer kilometers are being driven, overall operational efficiency has increased. Additionally, a team is more likely to drive safely and in accordance with the rules of the road. The organization has every reason to believe that as long as the system is used in secondary quarters, advancement will continue. According to the data, lower fuel consumption, safety, effective routing, and the removal of after-hours usage are only a few of the operational benefits of automatic vehicle management.

There was evaluation on the effect of logistics management applications on the effectiveness of operations at MSC, Kenya by Mukolwe and Wanyoike (2015). This study set out to assess how logistics management software affected MSC Kenya's operational effectiveness. The study demonstrated how efficient information flow management enhances both internal and external organizational functions. Accuracy, operational effectiveness, and scrap reduction are all significantly increased by task automation. The implementation of transportation and distribution management practices facilitates the efficient and expeditious allocation of resources, hence augmenting operational effectiveness. The study suggests employing state-of-the-art technology and providing personnel with training as a means of managing logistics applications.

Vehicle Financing and Maintenance on Profitability

Vehicle financing and maintenance play pivotal roles in determining the profitability of businesses and individuals alike. In the realm of businesses, vehicle financing is considered a critical component of operational efficiency. The literature underscores the significance of these two factors in various contexts, shedding light on their multifaceted impact. A study by Thomas & Deepti (2018) assessed the influence of vehicle financing on increased profitability in motor vehicle industries in Japan. The findings from the study highlighted that businesses can improve profitability by carefully selecting financing options that align with their cash flow and capital structure. Lease financing, for instance, allows companies to conserve capital for other investments and potentially enhance their bottom line. Moreover, a study by Zhang et al., (2021) highlighted the importance of understanding the tax implications associated with different financing methods, as smart tax planning can significantly impact profitability.

Muia (2018) did a survey on determination of the association between vehicle financial innovation and growth in profitability among vehicle processing firms in Oslo. The research study was conducted for two and half years, between February 2016 and August 2018. The study design used in the study was a descriptive research study design. The sampling method used by the survey was the census sampling technique through which all the 35 vehicle assembly points in Oslo, Norway, were incorporated by the study. Data obtained by the analysis were verified and analyzed using multiple regression. Data was presented in graphical and tabular form. It was determined by the study that maintenance of vehicles emerges as a cost-saving strategy that directly influences profitability. These findings were found to be in line with that of Rizet & Hine (2021) who established that regular and proactive maintenance reduces the total cost of ownership for vehicles over their lifespan. By preventing breakdowns and minimizing downtime, businesses can optimize their fleet's operational efficiency and reduce the need for costly emergency repairs.

Loeb & Kockelman (2019) conducted a study on Performances of fleet and evaluation costs shared for autonomous electric vehicles in Texas. The survey study ran from January to December 2019 for a duration of one year. The study employed a cross-sectional research design. The sampling method used by the survey was a random sampling technique. Data obtained by the analysis were verified and analyzed by carrying out multicollinearity tests. It was established by the study that advancements in predictive maintenance technologies, such as IoT-based sensors and data analytics, have gained prominence for their potential to further enhance maintenance practices and profitability.

Hayans (2019) did a survey to establish the link between vehicle financing and management on profitability in vehicle industries in South Africa. The survey study was conducted for eighteen months; between January 2018 and June 2019. The study adopted the use of a cross-sectional research design. The sampling method used by the survey was a random sampling technique through which the survey as the respondents selected 46 employees. Data obtained by the analysis were verified and analyzed by carrying out multicollinearity tests. The findings from the study determined that vehicle financing can also impact company's financial posture. The literature underscores the importance of choosing affordable financing options to avoid excessive interest payments and financial strain. In this regard, understanding the nuances of interest rates, loan terms, and down payments is crucial, (Hayans, 2019). Additionally, research emphasizes the potential for refinancing existing vehicle loans to secure better terms and reduce the overall cost of financing, thereby positively affecting one's financial well-being.

Vassallo & Izquierdo (2018) conducted a research to establish the level of effect of modeling road maintenance on financial performance. The study was carried out for one year, between April 2015 and June 2016. The study adopted the use of longitudinal research designs. The sampling method used by the survey was a stratified sampling technique. The research findings were verified to be correct and analyzed through correlation, linear and multiple regression analysis. It was determined by the survey that maintenance of vehicles is similarly vital for financial stability. Studies highlight the long-term financial benefits of routine maintenance, including extending the vehicle's lifespan and preserving its resale value. By addressing minor issues promptly, individuals can prevent more extensive and costly repairs down the road, ultimately reducing the overall financial burden of vehicle ownership, (Kamandanipour et al, 2023).

Chasha & Kamau (2022) established that vehicle financing and maintenance are integral components of profitability for both businesses and individuals. Their findings underscore the need for informed decision-making in vehicle financing, considering factors such as cash flow, tax implications, and affordability. Similarly, proactive and well-planned maintenance practices can significantly impact profitability by reducing operational costs and preserving the value of vehicles over time. This body of research provides valuable insights for businesses and individuals seeking to maximize their financial well-being in the context of vehicle ownership and operation.

CONCEPTUAL FRAMEWORK

By definition conceptual framework for any field research study is a diagrammatic representation of the study's dependent and independent variables. According to Walker (2020), a conceptual framework in a research study helps outline variables as well as indicators as investigated by the

analysis. The framework provides a structure that explains how different activities in the research are related to each other (Snyder, 2019). Flight management systems, car financing are the determinant variables. Operational performance, however, is the dependent study variable.

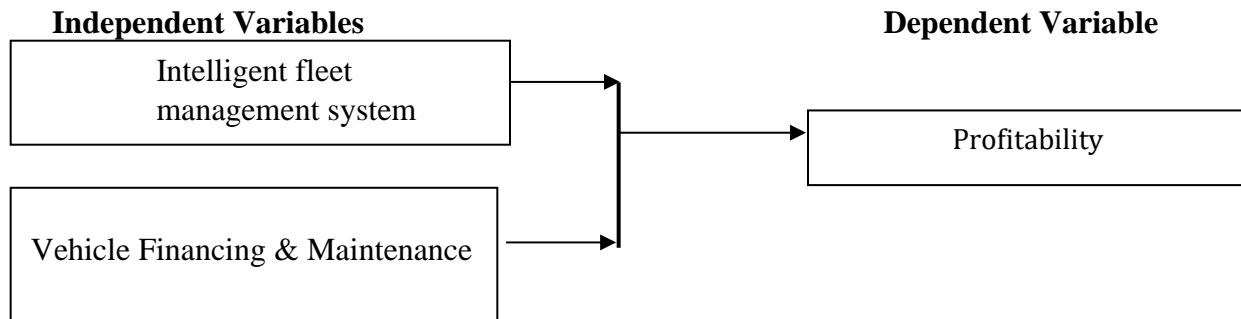


Figure 1: Conceptual Framework

RESEARCH METHODOLOGY

Research Design

Cooper & Schindler, (2014) describe research design to be "The procedures for collecting, analyzing, interpreting and reporting data in research studies" Robson (2018) explains that there are three types of research designs that can be used: explanatory, descriptive, and exploratory. An explanatory cross-sectional research design was applied in this Motrex study. It displays how individuals respond to inquiries about a condition or phenomena with the aim of appreciating the respondents' intuitions, which serve as the foundation for banality, (Kim, 2019).

Target Population

According to Robson and McCartan (2016), the target population is the group that the researcher intends to apply study findings to. The study targeted Motrex Limited, Kenya. Motrex Limited is one of the leading transporting companies in East and Central Africa with a fleet of over 500 heavy-commercial trucks with 1102 staff, comprising 14 senior management teams, 400 employees in the operations department, 300 employees in the field department, as well as 388 employees in supply chain and logistics.

Sample and Sampling Techniques

According to Etikan, Musa & Nukayya (2018), a sample is a subset selected from the entire population. One can learn something from studying a sample group and extrapolate it to the entire population. It is assumed that the conclusions drawn from the sample about the total population are roughly accurate. In this study stratified sampling technique was deployed. Stratified sampling technique is a technique that restricts the possible samples from the less extreme by ensuring all factions of the population are represented hence improving the accuracy and efficiency at the same time, (Lohr, 2014).

To determine the sample size, this study made use of Yamane's formula to determine the sample size with 95% confidence level.

$$\text{From } n = \frac{N}{(1+Ne^2)}$$

Where, n = sample size, N = Study Population = 1102e = Alpha level of 0.05

The sample size was:

$$n = \frac{1102}{1 + 1102(0.05^2)}$$
$$n = 400$$

Research Instruments

The data for the study was collected using questionnaires. The questionnaire used closed-ended questions which were redistributed via hand delivery.

Pilot Study

A pilot study, as defined by Pearson et al. (2020), is an initial small-scale version or trial run designed to test the functionality of research instruments, setting the stage for the comprehensive study to follow. This preliminary investigation was conducted as part of the study to evaluate how well the questionnaires work in gathering the required data, guaranteeing its validity and reliability for the primary research project. In addition, Volkart and Bouillon (2016) clarified that a pilot test replicates and practices for the main survey, highlighting the vital function that it plays in the research process. For piloting, 10% of the sample size was considered. To be more precise, 40 respondents were considered from every department and all of them were excluded from the total number of study participants.

Validity

KMO as well as Bartlet test were applied to measure the validity of the tool. Creswell (2017) indicated content validity of an instrument was enhanced through skilled ruling as such the researcher eliminated any prejudice in the research instrument by creating them in line with the objective of the study. Validity indicates that degree to which the instrument measures the contrasts under investigation, (Mugenda and Mugenda, 2013). Validity indicates the degree to which scores are consistent with the objective of measurement and free of measurement errors. The researcher also sought advice and second opinion from experts in this field who gave their thoughts. This allowed the researcher to evaluate the eminence of the piloted questionnaires which enabled this work to describe the reliability of answers and made modification as was required. Simple words were used to certify easy indulgent by participants.

Reliability

Level to which study instruments in a study provides dependable data on frequent repeated investigations, (Robson, 2018). It is the trend towards constancy found in recurring measurements. The researcher constructed questionnaires that were given to the respondents who were not imperiled to this research. The same questionnaires were attained with the same assortment of subjects with a two weeks break meaning a test re-testing process was used on the instruments. The data was thoroughly analyzed to ensure that the instruments were consistent to the set goals as well as content area under study. The supervisor's advice and comments were applied as a foundation to alter the study items and made them adaptable to the research. Based on the feedback

received, the wording of the instruments was appropriately modified. Cronbach's Alpha was calculated by correlating the score for every scale item with the total notch in lieu of each participant to the test and equating that to the alteration of the whole score. Construct testing in lieu of reliability was accomplished by computing Cronbach's Alpha. The recognized dependability score level is supposed to be above 0.7. Gay (2019) says that any research instrument with a split half coefficient of between 0.8 and 1.00 are acceptable and reliable enough. This survey helped the researcher to ensure that respondents can answer in the best possible manner.

Data Collection Procedure

Creating questionnaires to address the study's objectives marked the beginning of the data collection process. The study used structured questions, as they were easier to administer and analyze, considering the limited time and funding available for the research. The researcher issued the questionnaires to the respondents, who then returned them once they had completed filling them out. No research assistants were required, as the study focused on a manageable sample size.

Data Analysis and Presentation

Descriptive statistics, such as standard deviations and means, frequencies, and percentages, were employed to analyze the quantitative data, as suggested by Kothari and colleagues (2019). For qualitative data derived from open-ended questions, content analysis was utilized to quantify and examine the presence, meanings, and relationships of specific words, themes, or concepts, following the approach outlined by Jacobs and Tschötschel (2019). This data was presented through frequencies, tables, and bar graphs to clearly convey the findings. The Statistical Package for Social Sciences version 26 was leveraged for its capability to efficiently manage both small and large datasets, as noted by Metsämuuronen (2020). Additionally, inferential statistics were conducted to identify the nature of relationships between the variables under study. A regression model with heteroscedasticity, parameter estimates might have been biased. The variance of the error term needed to remain homoscedastic across all observed datasets, which is one of the assumptions of regression analysis. The Breusch-Pagan test was used to assess whether the error variance was constant, implying heteroscedastic data. The presence of heteroscedasticity was indicated by the rejection of the homoscedasticity null hypothesis if the P-values were greater than 0.05, while the absence of heteroscedasticity was shown by the acceptance of the homoscedasticity null hypothesis. Once all statistical assumptions for the data were satisfied, the hypotheses were tested to correlate with the study objectives.

The following is the equation for a regression model using study variables:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$$

Where: Y = Profitability ; X1 = Intelligent management system ; X2 = Vehicle financing and maintenance ε = Error term ; β_0 = Least changes in Y's value ; β_1 = Level of change in Y

Ethical Consideration

Ethical consideration, according to Bickman and Rog (2018), is the use of ethics during the course of a research study. All prospective replies were asked for their permission in advance. The privacy of the information provided in survey replies will also be upheld. Respondent participation in the data gathering exercise was entirely optional. Additionally, there were no personal, insulting, or derogatory terms or questions on the research questionnaire

FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

Findings

The field researcher issued 360 questionnaires to the respondents' and out of the 360 questionnaires 354 were returned fully and duly filled. This translated to 99% response rate which was deemed to be sufficient enough towards making a conclusion to the study. Saunders (2018), a response rate of above 75% is considered sufficient to arrive at the study's conclusions from the findings. Besides, Fowler (2014) notes that a response rate of at least 60% is typically desirable in survey research to ensure the validity and reliability of the findings. Male respondents were determined to be 78% of the entire respondents with 22% being female respondents. This implies a significant gender imbalance in the study, with males being the predominant respondents, in as much all the gender was considered in the survey. The research established that respondents who age bracket was below 30 years recorded the least percentage, 20% as compared to other age groups.

The employees at Motrex Limited aged between 31-40 years being the majority, recorded 46%. The respondents with an age bracket between 41-50 years was 28% while those above 51 years was determined to be 14% of the total respondents. This pattern shows that the workforce at Motrex Limited is predominantly in the 31-40 age group, suggesting a relatively young and experienced employee base. It was established by the study that 48% of the employees have served at Motrex Limited for a period between 0 and 5 years, 26% have served between 6 and 10 years whereas 16% have served between 10-15 years. Only 10% of the employees have served for a period more than 16 years at Motrex Limited. This implies that a majority of the employees at Motrex Limited have relatively short to mid-term tenure, with almost half having served for 5 years or less, indicating a possibly younger or more dynamic workforce. It was established by the study that the staffs at Motrex Limited who had achieved undergraduate education level was 34% of the total respondents, whereas 24% had attained up to certificate level. 36% had up to Diploma level with only 6% had attained up to post university level. This implies that the majority of the staff at Motrex Limited have a mid-level education, primarily at the diploma and undergraduate levels, with relatively few holding postgraduate qualifications.

Intelligent Fleet Management System (FMS)

The first objective of the study was to assess the effect of intelligent fleet management system on profitability of Motrex Limited, Kenya. Respondents agreed that logistics service provider's use of the FMS in conjunction with the existing technology has become one of its defining characteristics ($M=1.73$ $SD=0.31$). The study further established that Managing fleet and physical distribution procedures enables a quicker and more lucrative flow of commodities and raw resources, increasing operational efficiency ($M=1.42$ $SD=0.16$). This was therefore established to be affecting the profitability of Motrex Limited. The study findings also highlighted that IFMS offers substantial benefits in terms of vehicle monitoring and maintenance, which has a remarkable influence on the performance of Motrex Limited and was determined by ($M=1.79$ $SD=0.19$).

Majority of the respondents also agreed with the statement that IFMS enables better driver management and safety practices. This was determined by significant mean and standard deviation values of ($M=2.35$ $SD=0.26$), thereby influencing the performance of Motrex Limited. The study also determined that important knowledge and their abilities have increased for both clients and the company itself ($M=1.67$ $SD=0.12$). The study further determined that logistics service providers are working to expand their offerings and organize their data in order to quickly address

client requests, as determined by significant mean and deviation values of 2.16 and 1.13 respectively. The research findings concur with those of Jonsson and Mattsson (2013) who indicated that the ability to manage fleet and physical distribution processes effectively has been shown to enable a quicker and more lucrative flow of commodities and raw materials, thereby increasing operational efficiency. The findings are presented in the table below.

Table 1: Intelligent Fleet Management System on profitability

Aspects of Measurement	N	Mean	Std. Dev
Logistics service provider's use of the FMS in conjunction with the existing technology has become one of its defining characteristics.	354	1.73	0.31
Managing fleet and physical distribution procedures enables a quicker and more lucrative flow of commodities and raw resources, increasing operational efficiency.	354	1.42	0.16
IFMS offers substantial benefits in terms of vehicle monitoring and maintenance.	354	1.79	0.19
IFMS enables better driver management and safety practices.	354	2.35	0.26
Important knowledge and their abilities have increased for both clients and the organization.	354	1.67	0.12
Logistics service providers are working to expand their offerings and organize their data in order to quickly address client requests.	354	2.16	1.13

Vehicle Financing and Maintenance

The second objective of the study was to investigate the effect of vehicle financing and monitoring on profitability of Motrex Limited, Kenya. It was established by the study that vehicle financing and maintenance play pivotal roles in determining the profitability of Motrex Limited as indicated by significant mean and standard deviation values of; (M=2.73 SD=1.52). The study also established that Motrex Limited can improve profitability by carefully selecting financing options that align with their cash flow and capital structure. This was found to be significant as indicated by (M=2.42 SD=1.41) values. Besides, the respondents agreed with the statement that maintenance of vehicles emerges as a cost-saving strategy that directly influences profitability of Motrex Limited (M=1.97 SD=0.78).

The results from the investigation showed that advancements in predictive maintenance technologies, such as IoT-based sensors and data analytics, have gained prominence for their potential to further enhance maintenance practices and profitability of Motrex Limited (M=2.46 SD=1.39). This was found to be highly significant. Maintenance of company vehicles is similarly vital for financial stability as well as vehicle financing and maintenance are integral components of performance for both Motrex Limited and individuals within the business. This was determined by a significant mean and standard deviation values of (M=1.98 SD=0.81). The study findings concur with those of Dablanc and Rodrigue (2017) who posited out that the alignment of vehicle financing options with a company's cash flow and capital structure can significantly enhance

profitability by ensuring that financial obligations do not overwhelm operational budgets. This study reinforces that careful selection of financing options tailored to the company’s financial dynamics is not only prudent but essential for maintaining profitability. The findings were as tabulated in table 2 below.

Table 2: Vehicle Financing and Maintenance on profitability

	N	Mean	Std. Dev
Vehicle financing and maintenance play pivotal roles in determining the profitability of businesses and individuals alike.	354	2.73	1.52
Motrex Limited can improve profitability by carefully selecting financing options that align with their cash flow and capital structure.	354	2.42	1.41
Maintenance of vehicles emerges as a cost-saving strategy that directly influences profitability.	354	1.97	0.78
Advancements in predictive maintenance technologies, such as IoT-based sensors and data analytics, have gained prominence for their potential to further enhance maintenance practices and profitability.	354	2.46	1.39
Maintenance of company vehicles is similarly vital for financial stability	354	1.98	0.81

Profitability of Motrex Limited

The findings from the study determined that to achieve maximum profits, Motrex Limited focuses on decreasing the transportation, warehousing, labour, insurance and operational costs. This was established to be significant as indicated by mean and standard deviation values of (M=1.69, SD=0.48). It was also established by the study that to achieve improved performance and profitability, Motrex Limited offers variety of services and aims at volume flexibility (M=1.85, SD=0.91). It was further determined by the study that by promoting safer driving habits and providing real-time feedback, telematics systems contribute to a safer working environment, lower accident rates, and subsequently, reduced financial losses as indicated by (M=1.65, SD=0.79). The study also determined that Motrex Limited is working towards improving customer loyalty by reducing emissions and improving sales revenue (M=1.97, SD=0.73). The findings from the study further established that by improving communication, reducing lead time and keeping up to date with procurement information, Motrex Limited has achieved improved profitability in the past years as determined by statistically significant (M=2.11, SD=1.47) values. These finding aligns with research by Feng and Lu (2013), who found that regular and predictive maintenance is critical in reducing unexpected vehicle downtimes, thus saving costs and boosting overall profitability of the firm. The findings were presented in the table 3 below.

Table 3: Profitability of Motrex Limited

	N	Mean	Std. Dev
To achieve maximum profits, Motrex Limited focuses on decreasing the transportation, warehousing, labour, insurance and operational costs.	354	1.69	0.48
To achieve improved performance and profitability, Motrex Limited offers variety of services and aims at volume flexibility	354	1.85	0.91
Motrex Limited is working towards improving customer loyalty by reducing emissions and improving sales revenue.	354	1.97	0.73
By improving communication, reducing lead time and keeping up to date with procurement information, Motrex Limited has achieved improved profitability in the past years.	354	2.11	1.47

Inferential Statistics

Regression Model

Table 4: Regression Model Summary

Model Summary				
Model	R Value	R Square	R Square Adjusted	Estimate Error
1	0.834 ^a	0.723	0.681	.62468

Note: a. Predictors: (Constant), Profitability of Motrex Limited

From the regression model, the R square value was determined to be 0.723 indicating the proportion of the variance in the dependent variable that is predictable from the independent variable(s). An R² of 0.723 implies that approximately 72.3% of the variance in the profitability of Motrex Limited can be explained by the model. This is the correlation coefficient (R) between the observed and predicted values of the dependent variable. On the other hand, the correlation was determined by an overall coefficient of correlation of (R) to be 0.834 as presented in the above table. This value measures the strength and direction of the linear relationship between the variables. An R value of 0.834 suggests a strong positive correlation between the dependent and independent variables. The adjusted R² accounts for the number of predictors in the model and adjusts the R² value to provide a more accurate measure of model fit, especially when multiple predictors are involved. It is generally lower than the R². An adjusted R² of 0.681 indicates that after adjusting for the number of predictors, the model explains approximately 68.1% of the variance in the dependent variable. The results suggest that fleet management strategies affect the profitability of Motrex Limited, as determined by the R Square value of 0.723.

Coefficients of Regression

A regression analysis was conducted to determine the level of influence of the independent variables on the dependent variable.

Table 5 : Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	0.723	0.214		0.481	0.765
Intelligent Fleet Management	0.681	0.106	0.611	3.872	0.000
Vehicle Financing	0.741	0.121	0.317	1.873	0.000

The results indicated that the linear regression model. $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \varepsilon$ is $Y = 0.723 + 0.681X_1 + 0.741X_2$

The model shows that when other factors are held constant, an increase in the use of independent variables (intelligent fleet management, vehicle financing and maintenance, adoption of ICT, vehicle telematics) by 1% improves Profitability of Motrex Limited. The level of profitability of Motrex Limited would be at 0.723 when all the variables are held constant. Therefore, a unit change in intelligent fleet management would positively increase the Profitability of Motrex Limited by a coefficient factor of 0.681. A unit increase in vehicle financing and maintenance would positively lead to an increase the profitability of Motrex Limited by 0.741. Hence, the independent variables positively influence profitability of Motrex Limited as presented in the table above.

Correlation Analysis

Correlation analysis was conducted to test the existing relationship between the independent variable (intelligent fleet management, vehicle financing, adoption of ICT, vehicle telematics) and the dependent variable (Profitability of Motrex Limited). The analysis showed a strong positive significant correlation between Intelligent Fleet Management and profitability of Motrex Limited. This was evident by the correlation factor of 0.681. The strong relationship was statistically significant since the significant value was 0.001 that was less than 0.05 significance level. The study found a positive correlation between Vehicle Financing and profitability of Motrex Limited as indicated by the correlation of 0.741 and a significance value 0.001. This finding shows that vehicle financing has significant impacts on the profitability of Motrex Limited. The strong relationship was statistically significant since the significant value was 0.001 that was less than 0.05 significance level.

Recommendations

As underpinned with the study's findings, it is recommended that Motrex Kenya Limited continues to leverage vehicle telematics technology to further enhance fleet management practices. Investing in advanced telematics systems can provide even greater benefits by integrating cutting-edge features for real-time vehicle diagnostics, proactive maintenance scheduling, and improved safety measures. By doing so, the company can further reduce financial losses associated with accidents and maintenance issues while promoting safer driving habits among its drivers. Regular updates and training on telematics technology should be provided to ensure that staff fully utilize the system's capabilities and stay informed about the latest advancements.

Additionally, Motrex Limited should consider expanding its use of telematics-based insurance programs that reward safe driving. Such programs not only encourage better driving behavior but also offer financial incentives through reduced insurance premiums, contributing to overall cost savings. The company should also explore opportunities for integrating telematics data with other operational systems to optimize fleet performance and enhance decision-making processes. By fostering a data-driven approach and continually assessing the effectiveness of telematics in improving fleet management, Motrex Limited can sustain its competitive advantage and achieve long-term profitability.

Conclusion

To conclude, the adoption and execution of Intelligent Fleet Management System (IFMS) at Motrex Limited has proven to be a critical factor in enhancing both profitability and operational efficiency. By integrating this advanced system with existing technologies, Motrex has not only streamlined its fleet management and distribution processes but also significantly improved vehicle monitoring, maintenance, and driver safety practices. These improvements have collectively bolstered the company's overall performance, fostering a more responsive and capable logistics service. Additionally, the adoption of IFMS has facilitated knowledge and skill development for both clients and the company, enabling Motrex to expand its offerings and better meet client demands, thereby securing a competitive advantage in the industry.

The study concluded that effective vehicle financing and maintenance are pivotal to the profitability of Motrex Limited. By choosing financing options that align with the company's financial structure and implementing rigorous vehicle maintenance practices, the company can significantly boost its profitability. The adoption of advanced predictive maintenance technologies, including IoT-based sensors and data analytics, is expected to further enhance maintenance efficiency and financial performance. Additionally, maintaining company vehicles is also crucial for ensuring financial stability within the business. Overall, the study underscores the integral role of both vehicle financing and maintenance in optimizing the performance and profitability of Motrex Limited and its stakeholders. The researcher recommends further analysis be carried out focusing on the fleet management strategies and profitability of transport companies in Kenya which is one of the fewer focused and under examined segments amongst experts and academicians. Therefore, related cross sectional as well as longitudinal studies to contribute to enhancement of fleet management must be carried out. The investigator indorses additional studies which identifies the role of government in empowering players in transportation as well as supply chain.

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