

INFLUENCE OF FLEET MANAGEMENT PRACTICES ON SERVICE DELIVERY TO REFUGEES IN UNITED NATIONS HIGH COMMISSIONER FOR REFUGEES KENYA PROGRAMME

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ABSTRACT

Transportation is at the center of logistics as it represents the physical movement of materials between points in a supply chain. High customer expectations and little tolerance for inadequate performance create a competitive environment for operating a fleet, which forces fleet managers to achieve high levels of reliability and cost-efficiency. UNHCR has been experiencing problems with the management of the fleet of vehicles for example vehicle maintenance. There is no vehicle maintenance and repair system in place to capture all aspects of this important function with regards to scheduling of repairs and maintenance and identification of a reputable garage for repairs. Procurement of spare parts is said to be done haphazardly between UNHCR Branch office and the field locations of Kakuma and Dadaab with no proper coordination with a view of centralization or decentralization. The study sought to establish the influence of fleet management practices on service delivery to refugees in UNHCR. The study used descriptive research design. The target population for the study consisted of employees in transport and fleet management in UNHCR total of 390 employees from which the study used stratified random sampling to obtain a sample size of 117 (30%) respondents. Questionnaires were used to collect data which were hand delivered to the respondents. Data was analyzed using descriptive statistics, content analysis and regression analysis. The study may be beneficial to United Nations agency mandated with the task of providing protection to refugees globally as it helped them understand the influence of fleet management practices on service delivery. The study may also benefit the organization and management practices of the Fleet Support community, so that the fleet support community remains prepared to meet the dynamic challenges and expectations

over the next several decades. The study revealed that vehicles repair and maintenance influence service delivery to refugees in UNHCR Kenya programme to a very great extent. The study also established that fuel management influence service delivery to refugees in UNHCR Kenya programme to a great extent. The study concluded that fuel consumption rate tracking, fuel sourcing, fuel monitoring, allocating fuel day-to-day and monitoring usage rates aspects of fuel management influence service delivery to refugees at UNHCR Kenya programme. The study recommends that organizations should have a strict servicing and maintenance schedule for vehicles, routine checkup and maintenance, serviced engines, proper tyres, headlights and steering; spare parts should be available in stores, yearly purchase of spare parts and vehicle repair and maintenance should be done regularly to avoid many risks.

Keywords: *Influence of Fleet Management Practices on Service Delivery*

Introduction

The pressure to deliver faster and cheaper has made vehicle utilization an important aspect of fleet management (Jonsson 2008; Waters, 2009). Better vehicle utilization lowers operating cost through better planning. Transport planning requires software support with the use of transportation management systems. The aim is to determine routes that will provide the highest overall utilization of vehicle capacity, with as many customers served and the largest amount of goods delivered, at the same time as the delivery times are minimized. Advanced planning also takes into account specific factors such as road and traffic conditions, in order to provide a more realistic route. Technological communication improvements in the business environment have allowed for better planning through the use of electronic data interchange (EDI), radio frequency identification (RFID), satellite navigation, and so on (Waters, 2009). There have also been technical improvements within vehicle design, in order to meet environmental requirements.

For humanitarian organizations it is beneficial to have a large fleet of small vehicles, since it improves the efficiency and equity of aid operations. However, the operation and coordination of large fleets can be difficult for logisticians in the field (Huang, Smilowitz, and Balcik 2012). There is an increasing effort to develop and implement good software in the humanitarian sector for management of large fleet operations. Currently, such software is mostly used for tracking, monitoring and reporting purposes, but it lacks modules that will support operational decisions, for instance based on fleet cost. Routing and delivery scheduling decisions are made according to the insights and experiences of the logisticians (Huang, Smilowitz, and Balcik, 2012).

Martinez, Stapleton, and van Wassenhove (2011) found that information systems for coordination and routing at field level will have a positive impact on fleet performance and route

optimization. However, there is generally a lack of data bases and funding to purchase such a system.

[Bask et al. \(2010\)](#) observed that logistics and transportation services in developing countries have been changing and diverging into several service segments. The multiple services provided earlier by transport and trucking companies have been broken down into several specialized services to attain lower costs (cut-rate trucking) or to offer value-added services (warehousing, packaging, price ticketing and final assembly) through third-party and fourth-party arrangements and alliances ([Bask et al., 2010](#)).

Humanitarian operations in Africa often implement relief and development aid in the field simultaneously (Besiou, Martinez, and van Wassenhove 2012), giving the fleet a dual mission. In accordance with emergency and development operations, the fleet has a different purpose. Emergency aid is mainly concerned with the speed of delivery, while development aid seeks to cover demand in a cost efficient manner. Fleet management for relief has a short duration, higher urgency with highly stochastic demand, and short response time (Martinez, Hasija, and van Wassehove 2010). Fleet management for development is characterized by longer duration and response time, as well as low urgency and stochastic demand.

A sustainable fleet management strategy is one that aims to reduce environmental impacts through a combination of cleaner vehicles and fuels, fuel-efficient operation and driving; and by reducing the amount of road traffic it generates (Besiou, Martinez, and van Wassenhove 2012). In doing so the fleet minimizes fuel and vehicle costs and improves the safety and the welfare of employees especially in developing countries while reducing its exposure to the problems of congestion.

UNHCR is the United Nations agency mandated with the task of providing protection to refugees globally. This includes giving material assistance in form of basic needs like shelter, food, water, medicine, and clothing. In order to do this effectively UNHCR has to have an efficient Fleet management system in place in order to ensure that the beneficiaries receive their entitlement and one of the important tools is a fleet of 500 vehicles that are a mixture of Light vehicles, trucks, and buses that ferry staff and materials within the camps. Efficient logistics are fundamental to effective UNHCR operations. UNHCR needs to professionalize its logistics capacity both in the

field and at headquarters if it is to ensure that the organization is running as close to its optimal edge as possible. This calls for employing more qualified fleet managers/logisticians who are equipped with a fleet data management system linked to workshop services. It also means that non-expendable assets need to be understood and appreciated for their utility and not just as line items in a budget (Kothari, 2008).

After staff salaries, the costs associated with surface transportation are the organization's largest year-to-year expenditure. Over the last four years UNHCR has averaged US\$9.6 million a year for the purchase of new vehicles for its partners and itself. This does not include operational costs, which can run two to four times the purchase price over the expected life of the vehicle. The organization strives to find savings when purchasing new vehicles, but it must also find ways to reduce operational costs during the life of the vehicle. Purchasing a new Land Cruiser directly from the manufacturer can save \$3-4000. But the savings between a well-managed Landcruiser and one that is maintained less cautiously can amount to more than \$20,000 over five years, not factoring the difference in resale values (Johnson and Scholes, 2006).

Not only are the vehicles the means by which staff and aid workers get to the beneficiaries, they represent a large capital investment that needs to be supported in order to achieve a maximum of efficiency. This supposes valuing vehicles beyond their initial investment and accommodating the recurring costs with sound management. Caution is needed to avoid pursuing savings that defeat their own ends.

Among other operating costs, UNHCR might look to its transport and logistics sector as one area in which costs appear out of line with the benefits and services accruing to refugees. In many operations, UNHCR maintains a quantity and quality of vehicles for its own use that is well beyond what it would ever consider providing to IPs (implementing partners) and their frontline workers who are in daily contact with refugees. The size of UNHCR's light vehicle fleet and - due to its purchase and funding - of so many operational partners' vehicles, places the organization in a unique status in the humanitarian arena; and since no other agency operates on the same scale, or in the same way, none could readily serve as a model for fleet management. While UNHCR is not a logistical agency, much of what it does depends on logistics (Harris & Ogbonna, 2001). With such a demand for staff mobility, it is reasonable that the organization makes an appropriate commitment to the logistical apparatus and financial outlay that would

enable the maximization of its many fleets. Senior managers need to appreciate the critical, if unglamorous, link that vehicles and transportation play in UNHCR's protection and assistance work. On average, 40% of UNHCR's annual non-staff costs are logistics-related. Over \$110 million is budgeted for these activities in 2005. This study focused on UNHCR Kenya since it is one of the biggest NGO's in Kenya and has a fleet of vehicles serving the Kakuma and Daadab, hence the study sought to identify how fleet management practices can influence UNHCR to improve their service delivery to refugees.

Statement of the Problem

According to UNHCR Report (2012), UNHCR has been experiencing problems with the management of the fleet of vehicles for example vehicle maintenance. There is no vehicle maintenance and repair system in place to capture all aspects of this important function with regards to scheduling of repairs and maintenance and identification of a reputable garage for repairs. Procurement of spare parts is said to be done haphazardly between UNHCR Branch office and the field locations of Kakuma and Dadaab with no proper coordination with a view of centralization or decentralization. The poor management of the fleet of vehicles in the 2011-2012 saw the UNHCR losing twenty million Kenya shillings due to escalating cost of repairs. This cost can be reduced if proper fleet management is in place (World Bank, 2013). UNHCR is losing over 5,000,000.00 Kenya shillings each year since 2010 up to date as the fuel management system is not functioning as it should (WB, 2013). There is a weakness in the system of issuing of fuel to the 500 vehicles and the total amount of fuel consumed and the cost keeps going up each year (UNHCR, 2013).

Most of the previous research (Mohamed, 2006; Kinyua, 2000 and Serem, 2003) related to transportation in humanitarian logistics has taken a central planner perspective without examining transportation implementation. There is little literature on the current Field Vehicle Fleet Management (Field VFM) in humanitarian operations and how existing managerial structures, strategic interactions and incentives shape fleet management in in-country programs. It is therefore difficult to conclude whether optimization methods could be used to improve in-country program delivery performance. In addition, if the unpredictable operating conditions, complex organizational structures, loose objectives, or donor constraints would make the use of decision tools too complex or prohibitively expensive (Balcik, Beamon and Smilowitz, 2008).

Well managed and maintained equipment can result in 20-30 % or more cost savings on running costs alone. Improved efficiency of the users can result in even more savings. Better acquisition, management and disposal of vehicles could save 12-17 percent (between US\$120 million and \$170 million a year) of an estimated \$1 billion annual spend ([Fleet Forum, 2012](#)). In past years some steps have been taken to create a more logistically structured approach to vehicle management (UNHCR, 2012), but these measures have been periodically undercut or eroded by

the pressure of budget cuts. The information from the foregoing background show that UNHCR experiencing challenges of fleet management resulting to loss of donor funds and thus losing trust from key donors (WB, 2013). This study therefore seeks to fill this research gap by establishing the influence of fleet management practices on service delivery in UNHCR.

Objectives of the Study

General Objective

The main objective of this study was to establish the influence fleet management practices on service delivery to refugees in UNHCR Kenya programme.

Specific Objectives

The study was based on the following research objectives:

1. To determine how vehicles repair and maintenance influences service delivery to refugees in UNHCR Kenya Programme.
2. To establish the influence of vehicles fuel management on service delivery to refugees in UNHCR Kenya Programme.
3. To assess how vehicles tracking influences service delivery to refugees in UNHCR Kenya Programme.
4. To determine the influence of driver management and training on service delivery to refugees in UNHCR Kenya Programme.

LITERATURE REVIEW

Theory of Replacement

Machine replacement problem has been studied by many researchers and is also an important topic in operation research and management science (Nahmias, 1997). Replacement theory is a useful tool in modeling many systems. The quantity-based replacement policy and time-based replacement policy for a single machine problem are reported. These two kinds of policies have been applied to inventory management problems. In a quantity-based replacement policy, a machine is replaced when an accumulated product of size q is produced. In this model, one has to determine the optimal production size q . In fleet a management an organization should determine the expected optimal workload of a particular fleet can handle depending on usage before it can be taken for repair and maintenance and later replaced. This should be done considering factors such as cost of running the fleet, repair and maintenance cost among others, it is important to note that these costs should not be higher than the cost of service provided by the fleet. While in a time-based replacement policy, a machine is replaced in every period of T .

For this model, one has to determine the optimal replacement period T in each production cycle. During the cycle however, the organization should also determine the appropriate intervals for repair and maintenance. In fleet management an organization has to project the optimal lifetime that a particular fleet should serve the organization after which it is replaced. This is crucial to ensure at all time the organization has a reliable capacity to serve its needs. This should be evaluated by experts for accuracy purposes.

The time-based policy is more preferable than the quantity-based dispatch policy for satisfying timely customer service. Especially, time-based shipment consolidations have become a part of the transportation contract among the members of a supply chain. Two analytic models were compared according to their average long-run performance. Average long-run costs for both models have been developed by using replacement theory. The costs here include both the cost of a new machine and the machine maintenance cost (Bagui, Chakraborti & Bhadra, 2012).

Replacement theory is generally concerned with the problem of replacement of machines, bulbs and men due to deteriorating efficiency, failure or break down. Replacement is usually carried out under the situations as: When existing items have outlived their effective lives and it may not be economical to continue with them anymore and When the items might have been destroyed either by accidents or otherwise. In fleet management fleet may be replaced if: The fleet performance have deteriorated with time; Replacement of fleet which did not deteriorate but failed completely after certain use; Replacement of fleet that became out of date due to new development; Gradual diminishing of the existing working staff in an organization due to retirement, accidents among others (Bagui, Chakraborti & Bhadra, 2012).

Resource Based View

The resource-based view comprises a rising and dominant area of the strategy literature which addresses the question of an organization's identity and it is principally concerned with the source and nature of strategic capabilities. The resource-based perspective has an intra-organizational focus and argues that performance is a result of firm-specific resources and capabilities (Wernerfelt, 2008). The basis of the resource-based view is that successful firms will find their future competitiveness on the development of distinctive and unique capabilities, which may often be implicit or intangible in nature. The essence of strategy should be defined by the firm's unique resources and capabilities (Rumelt, 2008).

Furthermore, the value creating potential of strategy, that is the firm's ability to establish and sustain a profitable market position, critically depends on the rent generating capacity of its underlying resources and capabilities (Conner, 2010). For Barney (2010) if all the firms were equal in terms of resources there would be no profitability differences among them because any

strategy could be implemented by any firm in the same industry. The underlying logic holds that the sustainability of effects of a competitive position rests primarily on the cost of resources and capabilities utilized for implementing the strategy pursued. This cost can be analyzed with reference to strategic factor markets (Barney, 1986), that is markets where necessary resources are acquired. It is argued that strategic factor markets are imperfectly competitive, because of different expectations, information asymmetries and even luck, regarding the future value of a strategic resource.

However, a serious resource-based approach omission is that there is not a comprehensive framework that shows how various parts within the organization interact with each other over time to create something new and unique (Nonaka and Takeuchi, 2011). The resource based view (RBV) suggests that competitive advantage and performance results are a consequence of firm-specific resources and capabilities that are costly to copy by other competitors (Barney, 2010). These resources and capabilities can be important factors of sustainable competitive advantage and superior firm performance if they possess certain special characteristics.

The implication of this argument is that efficiency rents stemming from such resources and capabilities could be categorized into two, interrelated dimensions (Spanos and Lioukas, 2001): Pure rents stemming directly from the efficient implementation of the given strategy currently pursued; it indicates that the more unique combination of resources the organization possesses in relation to rivals the higher is its performance. In this case firm effects are independent of strategy, and indirectly from enabling the firm to conceive and develop its strategy configuration; the more resources the better the ability of the firm for a strategy that fits better market demand and results in higher customers utility. The resource based view could be of great importance in fleet management to guide a better and smooth flow in service delivery. An organization should ensure that they have adequate fleet and it is maintained in to offer optimal service at any time.

Technology Diffusion Theory

Researchers in technology diffusion have generally assumed that the ultimate user or beneficiary of the innovation is one and the same person as the decision-maker, or the "adopter" (Kotler, 1976). That is, an individual who becomes aware of the new product, service or technology, seeks information about the innovation (often from interpersonal sources of communication) and, after considering the relative advantages of the new over the old decides whether or not to adopt. In such a model, the benefits of the decision to adopt accrue to the decision-maker, and the innovation decision is regarded as wise if over time, those benefits outweigh the costs paid by that same adopter.

However, usually the organizational decision-maker or adopter of an innovation is not the ultimate user of that innovation, or at least is less directly interactive with the technology than are other users, as for example, drivers and fleet managers in the case of fleet management. The fact that adopter and primary user are not synonymous terms in such cases is obvious; the implications of that simple fact for the successful management of innovation development and

Implementation are not so obvious (Barton, 2009). Fleet managers should ensure that the drivers and those charged in the maintenance of fleet do not interfere with the technology in the fleet for example vehicle tracking systems. This is because this is a technology that have proved to be beneficial especially when a vehicle theft have taken place as it aids in tracking the vehicles easily with the use of GPS technology.

Theory of Strategic Balancing

Strategic balancing is founded on the premise that the strategy of an organization is partly comparable to the strategy of an individual. Certainly, the performance of organizations is affected by the actors' behavior, such as the system of leaders' values (Collins et al., 2009). An organization wavers between many antagonistic poles that signify cooperation and competition. This allows for existence of various configurations of alliances that disappear only if the alliance swings in the direction of a mainstream of poles of confrontation.

Strategic balancing is comprised of three models which include: relational, symbiotic and deployment models. Competition attests to be part of the relational model and the model of deployment. It can be liable to undulation between the two aggressive strategies, one being primarily cooperative as depicted by the relational model and the other being predominantly competing as exemplified by the model of deployment. The organization can then take turns in adopting the two strategies so as to keep their relationship balanced. This argument is very close to that of Belsley et al (1980). According to Belsley et al, (1980), there are three types of competitive relationships: competition-dominated, cooperation-dominated, and equal relationships. The latter is also comparable to the fluctuation between the relational model and the model of deployment as described by Barney (2002).

Competitive strategies, should concentrate on the management-needs recognition process. A number of African insurances have achieved this. Hammer and Champy (2003) used the key intelligence topics (KIT) process to identify and prioritize the major intelligence needs of senior management and the organization itself. This made sure that intelligence operations were successful and suitable intelligence was produced. Their approach is valuable since it allows corporate intelligence staff to recognize strategic issues and as a result senior management can guarantee that action is taken regarding the results given. The additional advantages are that an early warning system can be created and this will allow possible threats to the organization and major players in the industry are identified and monitored. Theory of strategic balancing can come in handy in setting priorities in an organization and ensure that there is smooth running of fleet. An organization can have schedules of oil change, routine servicing, and spare part management to ensure an optimal service delivery by the fleet. An organization should also ensure that the fleet is fueled occasionally and strategically to avoid break down of fleet when it's most needed. This can cause delays, inconveniences and great losses to an organization.

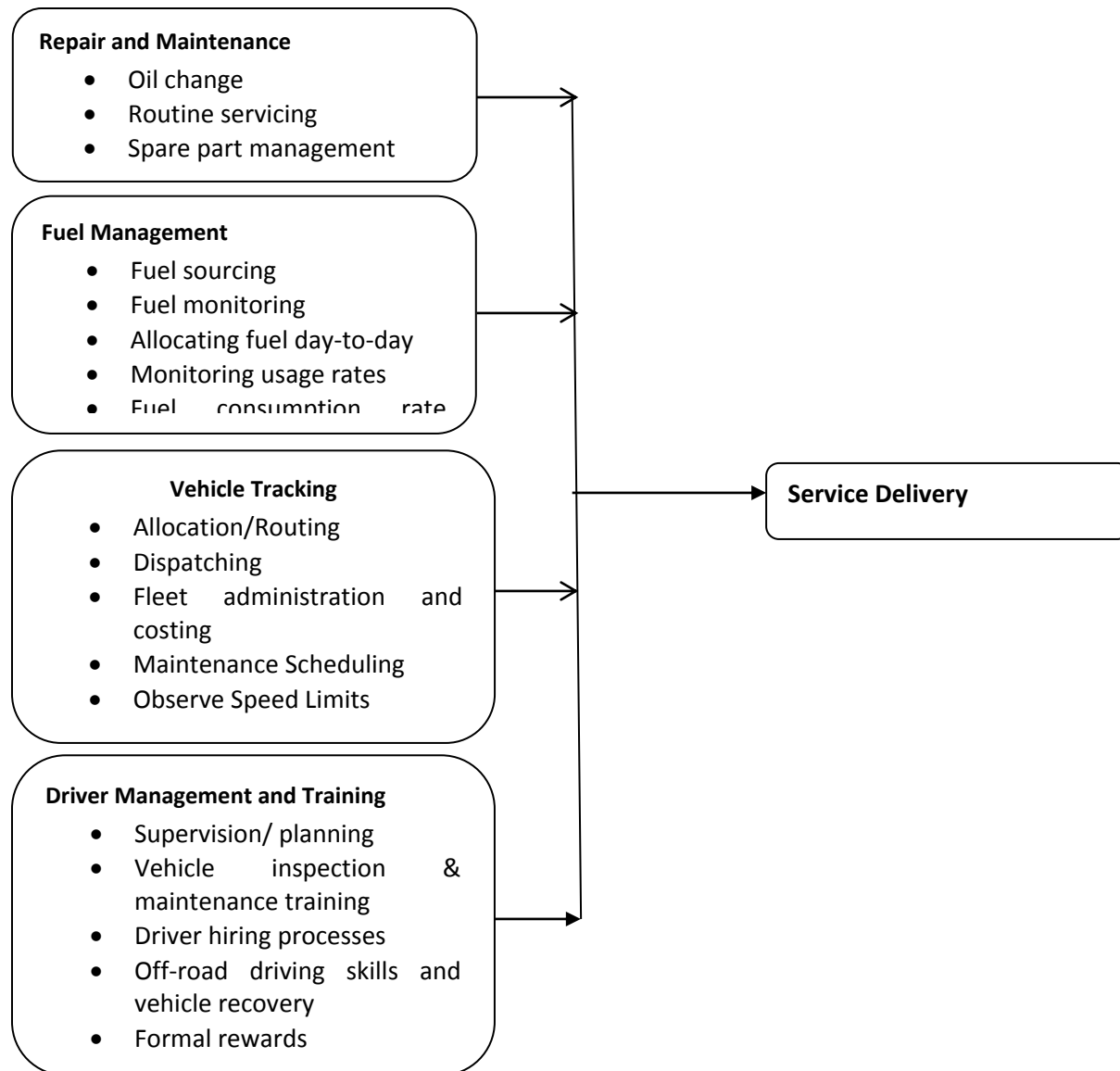
Human Capital Theory

Based on the transferability of the acquired skills, human capital theory distinguishes between investments in general-usage and specific human capital. As pointed out by Becker (1964), this distinction is important if these investments take the form of employer-provided training. While the returns to specific training can be realized only in an ongoing relationship with the training firm, general training increases the productivity of a worker in many firms besides those providing it. Becker's theory separately addresses these phenomena and draws two main conclusions. First, employers will share the returns and the cost of investments in firm-specific skills with their employees. Second, in a competitive labor market firms will not invest into general skills of their employees due to their inability to collect the returns from such investments. Therefore, workers will pay the full cost of general training.

This theory will be used in the study to focus on driver management and training. The importance of training cannot be overlooked and it is important that every organization should strive to add value to the employees through training and this is reciprocated through better performance and evasion of costs that otherwise would have been incurred due to lack of sufficient training. The drivers need to be trained on how to detect certain hitches in the fleet and how they can quickly respond to them before consulting an expert to avert damage from occurring. The drivers also need sensitization on safe road use among other practices that will be of mutual benefit to the organization and to the drivers themselves. As in human capital theory this will better the performance of the organization (Franz and Soskice, 2011). However, the organization in this case should facilitate the training of the drivers without necessarily sharing the cost.

Conceptual Framework

Conceptual framework as a concise description of the phenomenon under study accompanied by a graphical or visual depiction of the major variables of the study (Mugenda, (2008). According to Young (2009), conceptual framework is a diagrammatical representation that shows the relationship between dependent variable and independent variables. In the study, the conceptual framework will look at the influence of fleet management practices on service delivery in UNHCR.



Independent variables

Dependent variable

Figure 1: Conceptual Framework

Empirical Review

Murdy (1999) did a study to evaluate the effectiveness of the Fleet Support community's management practices in meeting the dynamic changes in the complex fleet support arena, while increasing its value to the Navy in the future. The Fleet Support community's mission statement was used as a benchmark in the evaluation process. Data on billet base management, accession policies, education and the detailing process were evaluated against the mission statement to determine the extent to which these practices support it. The results of the study indicated that

current practices provide limited support in meeting the Fleet Support community's mission statement.

Russell (2000) did a study on the humanitarian relief supply chain an analysis of the 2004 South East Asia earthquake and tsunami. The study created a survey concerned with supply chains used in the Tsunami relief effort. The surveys were distributed while the organizations were still actively involved in the relief effort. The surveys collected data on the whole relief chain and sought to determine issues that hampered relief efforts. The survey interviewed organizations alone about their supply chain, while the beneficiaries, other actors in the field, or government officials were not consulted. The study found out that each disaster response should be better than the last. In order to improve humanitarian relief for the next disaster, work needs to be done to change the way that people view philanthropy. Giving money, earmarked solely for an immediate crisis makes little difference in an organization's efforts to respond to the next crisis. Funds need to be designated to develop insights and technology that apply across organizations. New process and technology infrastructure could support communication and coordination, assessment systems for early warning and response, knowledge systems to capture and apply lessons learned from previous efforts, and humanitarian logistics systems. Mayak (2004) conducted an in-depth study to uncover the causes of accidents and fully detail their consequences. Mayak produced a report that provided a baseline understanding of the nature of Merck driver accidents from several angles, including the relationship between accident frequency and severity. The study also identified trends corresponding to driver demographics and recommended avenues to reduce the company's accident rate, improve its understanding of the accident experience, and focus its safety training efforts.

Herrmann (2006) did an evaluation of the utilization and management of UNHCR's light vehicle fleet. In the development and preparation for the evaluation it was expected that an experienced logistician would collaborate with EPAU in a critical analysis of UNHCR's transportation response, relying on both field-based observations and a quantitative analysis of available data.

Soltun (2007) carried out a study on Fleet Management Optimisation which was built around the concept of fleet management, focusing on designing and implementing a solution for such a purpose. The study was approached as a combination between a literature study (theory and business model creation) and a software design process (design and implementation). The study proposed that implementing the GIS functions was to be done after the proposed system was complete, and implementing the remaining functionality in co-operation with a possible customer was a good approach to discover necessary functionality that had not been detected in the work process.

The process of monitoring and increasing efficiency of transportation problems is called fleet management. The services included in a fleet management tool vary depending on the organization in context. According to Ratcliffe (2007), 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 so as to serve as a guide for these activities.

Ratcliffe (2007) emphasizes that the most important thing in fleet management is cost management. The fleet manager has to 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.

Martinez, Wassenhove and Stapleton (2009) did a study on Field Vehicle Fleet Management in Humanitarian Operations: A Case-Based Approach. Transportation is the second largest overhead cost to humanitarian organizations after personnel. The international 4x4 Field Vehicle Fleet size is estimated between 70,000 and 80,000 units with a cost above \$1 billion per year. Nevertheless, academic knowledge about fleet management in humanitarian operations is scarce. By using a multiple case research design we study field vehicle fleet management in 4 large international humanitarian organizations (IHO): the International Committee of the Red Cross, the International Federation of Red Cross and Red Crescent Societies, the World Food Program and World Vision International. The field research included more than 40 interviews at headquarters, regional and national level in Africa, the Middle East and Europe. The study's aim was to answer three questions: How do IHO manage their field vehicle fleets? What are the critical factors affecting IHO field vehicle fleet management? How does field vehicle fleet management affect in-country program delivery? The findings showed that in the centralized and hybrid fleet management models, management of the fleet ends when vehicles arrive in the country of operation. As a consequence, it can be the case that more than 50% of the total cost of the fleet is not optimized. Finally, the study suggested further research areas in transportation and fleet management in humanitarian operations.

Zeimpekis (2009) conducted a study on design and evaluation of a real-time fleet management system for dynamic incident handling in urban freight distributions. The aim of the study was to enhance urban delivery execution by modelling the process of dynamic incident handling through the design and implementation of a real-time fleet management system. The research methodology that was followed combined three basic steps: literature review and interviews for requirements elicitation and system design, theoretical system testing and evaluation via simulation and confirmatory study of the theoretical results through field experiments in two freight operators. During the design process of the system the study focused on two main performance aspects of the system. Firstly, such systems should have the ability to detect time deviations from the initial plan when they occur. The study proposed thus, a method for travel time estimation which is based on historical data from previous delivery deliveries. The study demonstrated that this method provides very accurate results when traffic conditions are not

exceptionally different from the historical ones. However, in urban settings there are cases in which travel times vary significantly during the day. For these cases the study proposed a second travel prediction method that uses real-time data to compute travel times in a dynamic manner. To enhance performance the system incorporated an intelligent mechanism that selects the method that gives the most accurate prediction based on traffic patterns and vehicle's state. A second critical issue for such systems is the decision process on whether a detected deviation between the scheduled delivery program and the current time prediction is significant or not. The study proposed and evaluated two alternative methods which can be used to guide the system decision for rerouting. The results showed that both techniques can be used according to the traffic patterns of the road that a vehicle is traversing.

Research Methodology

The study adopted descriptive research design. A descriptive research design determines and reports the way things are (Mugenda & Mugenda, 2003). Creswell (2003) observes that a descriptive research design is used when data are collected to describe persons, organizations, settings or phenomena. Descriptive design is ideal as the study was carried out in a limited geographical scope and hence is logistically easier and simpler to conduct considering the limitations of this study (Mugenda 2008). The design also has enough provision for protection of bias maximized reliability (Kothari, 2008). Descriptive design uses a preplanned design for analysis (Mugenda and Mugenda, 2003). In this study measures of central, dispersion distribution were applied.

Research Findings and Discussion

Regression Analysis

In this study, a multiple regression analysis was conducted to test the influence of each of the four variables with respect to service delivery. The research used statistical package for social sciences (SPSS V 21.0) to code, enter and compute the measurements of the multiple regressions

Table 4.1: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.892	0.796	0.734	0.708

R-Squared is a commonly used statistic to evaluate model fit. R-square is 1 minus the ratio of residual variability. The adjusted R^2 , also called the coefficient of multiple determinations, is the percent of the variance in the dependent explained uniquely or jointly by the independent variables. 73.4% of the changes in service delivery could be attributed to the combined effect of the predictor variables.

Table 4.2: Summary of One-Way ANOVA results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.374	4	3.113	4.091	0.001
	Residual	83.561	93	0.642		
	Total	94.935	97			

The probability value of 0.001 indicates that the regression relationship was highly significant in predicting how repair and maintenance, fuel management, vehicle tracking and driver management and training influenced service delivery at UNHCR. The F critical at 5% level of significance was 4.091 since F calculated is greater than the F critical (value = 2.47), this shows that the overall model was significant.

Table 4.3: Regression coefficients of the relationship between service delivery to refugees at UNHCR and the four predictive variables

Model		Unstandardized Coefficients		Standardized Coefficients		Sig.
		B	Std. Error	Beta	t	
1	(Constant)	1.419	0.298		4.236	0.024
	Repair and Maintenance	0.869	0.0585	0.37	4.101	0.016
	Fuel Management	0.603	0.164	0.312	5.36	0.037
	Vehicle Tracking	0.582	0.549	0.109	3.902	0.026
	Driver Management and Training	0.529	0.543	0.107	3.762	0.015

As per the SPSS generated table above, the equation ($Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \epsilon$) becomes:

$$Y = 1.419 + 0.869X_1 + 0.603X_2 + 0.582X_3 + 0.529X_4$$

The regression equation above has established that taking all factors into account (repair and maintenance, fuel management, vehicle tracking and driver management and training) constant at zero service delivery will be 1.419. The findings presented also show that taking all other independent variables at zero, a unit increase in the scores of repair and maintenance would lead

to a 0.617 increase in the scores of service delivery, a unit increase in the scores of fuel management will lead to a 0.603 increase in the score of service delivery, a unit increase in the scores of vehicle tracking will lead to a 0.582 increase in the scores of service delivery and a unit increase in the scores of driver management and training would lead to a 0.529 increase in the scores of service delivery. .

Overall, repair and maintenance had the highest influence on service delivery, followed by fuel management, then vehicle tracking while driver management and training had the least effect to the service delivery. All the variables were significant ($p < 0.05$).

Conclusions

From the findings, the study concludes that vehicles repair and maintenance influence service delivery to refugees in UNHCR Kenya programme. The study also concludes that aspects of repair and maintenance including routine servicing, oil change, maintaining correct tyre pressures, arranging for repairs on automobiles within the fleet and spare part management influence service delivery to refugees at UNHCR Kenya programme.

The study concludes that fuel consumption rate tracking, fuel sourcing, fuel monitoring, allocating fuel day-to-day and monitoring usage rates aspects of fuel management influence service delivery to refugees at UNHCR Kenya programme.

The study further concludes that allocation/ routing, observe speed limits, fleet administration and costing, real-life setting the positioning information and dispatching and maintenance scheduling are aspects of vehicle tracking that influence service delivery to refugees at UNHCR Kenya programme.

The study also concludes that driver management and training influence service delivery to refugees in UNHCR Kenya programme this is through supervision/ planning, vehicle inspection & maintenance training, formal rewards, defensive driving training and driver hiring processes.

The study finally concludes that repair and maintenance had the highest influence on service delivery, followed by fuel management, then vehicle tracking while driver management and training had the least effect to the service delivery

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References

- Balcik, F., Beamon, G. & Smilowitz, A. (2008). Performance measurements in humanitarian relief chains. *International Journal of Public Sector Management*, Vol. 21 (1), 4-25.
- Barney, J. B. (2002). *Gaining and sustaining competitive advantage*. New Jersey: Prentice Hall.
- Bask, A.H., Tinnilä, M. & Rajahonka, M. (2010). Matching service strategies, business models and modular business processes. *Business Process Management Journal*, Vol. 16 (1), 153-180.
- Besiou, M., Martinez, A. J.P. & Van Wassenhove, L. N. (2012). The Effect of Earmarked Funding on Fleet Management for Relief and Development. *INSEAD Working Paper*.
- Collins, A., Henchion, M. & O'Reilly, P. (2009). Logistics customer service: performance of Irish food exporters. *International Journal of Retail & Distribution Management*, Vol. 29 (1), 6-15.
- Creswell, R. (2003). Sensitivity analysis of a dynamic fleet management model using approximate dynamic programming. *Operations Research*, 55 (2), 319-331.
- Fleet Forum, last accessed in August 2012: www.fleetforum.org
- Harris, M. & Ogbonna, J. (2001). *Humanitarian Logistics: Enabling Disaster Response*.
- Huang, M., Smilowitz, K., & Balcik, B. (2012). Models for relief routing: Equity, efficiency and efficacy. *Transportation Research Part E* 48, 2-18. GRA 19003: Master Thesis 01.09.2012 117
- Johnson, G. & Scholes, K. (2006). *Exploring Corporate Strategy*, 6th Edition. Europe: Prentice Hall.
- Kinyua, N. (2000). *Business Research Methods: A Practical Approach*. London: Chartered Institute of Personnel and Development (CIPD).
- Kothari, T. (2008). Logistics Training: Necessity or Luxury? *Forced Migration review*, (22), 60.
- Kotler, A. (2006). Define Then Achieve Fleet Optimization. *Power Engineering*, November, 116-122.

- Martinez, A. J. P., Stapleton, O. & Van Wassenhove, L.N. (2011). Field Vehicle Fleet Management in Humanitarian Operations: A case-based approach. *Journal of Operations Management* 29, 404-421.
- Mohamed, C. (2006). *Gaining and sustaining competitive advantage*. 4th Ed. Oxford: Oxford University Press
- Mugenda, M. O. & Mugenda, F. (2003). *From Logistics to supply chain management: the path forward in the humanitarian sector*. Nairobi.
- Mugenda, M. O. (2008). Predicting the Unpredictable-Demand Forecasting International Humanitarian Response. Nairobi.
- Serem, U. (2003). *How to Sample in Surveys*. 2nd ed. Thousand Oaks, California.
- Waters, D. (2009). *Supply Chain Management: an introduction to logistics*. 2nd edition, London: Palgrave Macmillian.