

THE RELEVANCE OF VEHICLE TRACKING SYSTEM AND EFFECTIVE DECISION MAKING BY FLEET MANAGERS IN CORPORATE ORGANIZATIONS.

(A STUDY OF SELECTED DISTRIBUTION FIRMS IN RIVERS STATE).

Ibiama Kenneth Adonye,

Department of Transport and Logistics, Federal Polytechnic of Oil and Gas, Bonny, Nigeria, kenibiama@yahoo.com, 08037307629.

Longjohn Peter Idanye,

Centre for Logistics and Transport, University of Port Harcourt, Choba, Nigeria, pacerdigitalprint@gmail.com, 08033908442.

Nwankwoala Smart Chimezie,

Department of Transport and Logistics, Federal Polytechnic of Oil and Gas, Bonny, Nigeria, aaonsmarty1@gmail.com, 09062207651
Corresponding Email: kenibiama@yahoo.com

ABSTRACT

The study investigates the importance of vehicle tracking systems in decision-making by fleet managers in distribution firms in Rivers State. Data was collected through questionnaires and analysed using chi-square. The population of study was 100 respondent and a sample size of 80 respondents using taro Yamane formula. Distribution firms use GPS-based, real-time, and cellular tracking devices for distribution. Issues with tracking devices include SIM failure, external power failure, network outages, and fees. Recommendations include training drivers, avoiding vehicle battery power usage, and ensuring antennas are available nationwide to ensure device functionality.

Keywords: Vehicle Tracking System, Fleet, Managers, Performance, Telematics Information

Introduction

In the ever-evolving landscape of corporate organizations, efficient fleet management has emerged as a critical factor in achieving operational excellence and maintaining a competitive edge. As distribution firms grapple with the challenges of timely deliveries, cost optimization, and resource allocation, fleet managers play a pivotal role in making effective decisions to streamline operations and enhance overall performance. In this pursuit, the relevance of Vehicle Tracking

Systems (VTS) has gained significant attention, providing real-time data and insights that empower fleet managers to make data-driven decisions.

According to Schmitz and Barmann (2020), Vehicle Tracking Systems utilize cutting-edge technologies such as Global Positioning Systems (GPS) and telematics to monitor and transmit real-time information about vehicle locations, routes, fuel consumption, and driving behaviors. This real-time data empowers fleet managers with the ability to

proactively respond to challenges and optimize operational efficiencies. The adoption of Vehicle Tracking Systems has seen widespread acceptance across various industries due to their potential benefits in fleet management. As noted by Liu, Li, and Hu (2021), these benefits include improved fleet visibility, route optimization, reduced fuel consumption, enhanced driver performance monitoring, and optimized maintenance scheduling. With the aid of VTS, fleet managers can gain comprehensive insights into their fleets, enabling better-informed decisions to maximize resource utilization and minimize operational costs.

Furthermore, Edward (2013) conducted a case study on the implementation of a fleet management system in Kenya Power & Lighting Company Limited. The study explored how leveraging technology through VTS has improved fleet operations and decision-making in the context of a utility company. While previous research has explored the advantages of VTS in fleet management, there remains a dearth of literature focusing on its implications for distribution firms in Rivers State, Nigeria. Understanding the specific context of distribution firms is crucial as they face unique challenges related to diverse terrains, varying road conditions, and logistical complexities in the region.

Therefore, this study seeks to investigate the relevance of Vehicle Tracking Systems and their impact on effective decision-making by fleet managers in selected distribution firms in Rivers State. By conducting an in-depth analysis of VTS integration and its influence on decision-making processes, the research aims to bridge the existing gap in knowledge and contribute to the practical implementation of VTS in the context of distribution firms.

1. The Need For The Research

The need for this research arises from the increasing importance of efficient fleet management in corporate organizations, particularly in the context of distribution firms. Fleet operations play a critical role in ensuring timely deliveries, reducing operational costs, and maintaining a competitive edge in today's dynamic business environment. Effective decision-making by fleet managers is essential to optimize resource allocation, improve vehicle utilization, and enhance overall fleet performance. The relevance of Vehicle Tracking Systems (VTS) lies in their ability to provide real-time data and insights about vehicle locations, routes, fuel consumption, and driver behavior. This research empowers fleet managers to make informed decisions, monitor fleet performance, and proactively address operational challenges. By leveraging VTS, fleet managers can improve route planning, minimize fuel wastage, enhance driver safety, and maintain compliance with regulatory requirements. These capabilities are crucial in maximizing efficiency and productivity in distribution firms.

According to Schmitz and Barmann (2020), VTS has become a transformative technology in fleet management, revolutionizing decision-making processes and positively impacting operational outcomes. Liu, Li, and Hu (2021) further highlight that VTS adoption can lead to improved fleet visibility, route optimization, and reduced operating costs.

However, despite the growing importance of VTS in fleet management, there is limited research specifically focused on its implications for distribution firms in Rivers State, Nigeria. The region's unique logistical challenges, varying road conditions, and diverse terrains require an

in-depth investigation to understand how VTS can be effectively integrated into fleet management practices in this context.

Thus, the aim of this research is on the relevance of vehicle tracking system and effective decision making by fleet managers in cooperate organization with selected distribution firms in rivers state with specific objectives;

To determine the distribution channel of manufacturing firms.

To ascertain the vehicle tracking system used by manufacturing firms.

To access the types of vehicles in which the tracking device is installed.

To determine the type of information vehicle tracking device emit.

To evaluate the challenges fleet managers encounter on the use of the vehicle tracking device in distribution of goods.

Businesses face increasing pressure to reduce costs, increase revenue, comply with legislation, and protect assets. The installation of tracking devices in vehicles can help address past issues of lost goods, driver disappearance, and driver location issues. Fleet managers can monitor idle and active time, track vehicles from point of departure to destination, and enhance distribution performance by ensuring timely and accurate delivery of goods.

The findings from this research will contribute to the existing body of knowledge on VTS implementation in fleet management, provide practical insights for distribution firms, and offer recommendations for optimizing fleet operations and decision-making processes.

2.0 Literature Review

2.1 Technology Adoption Theory

The Technology Adoption Theory, proposed by Rogers (1962), focuses on the process through which innovations are adopted and diffused within an organization. In this research, VTS represents the innovation, and its adoption and implementation in distribution firms will be explored. This theory provides a framework to understand the factors influencing VTS adoption, including relative advantage, compatibility, complexity, trialability, and observability. It will help identify the barriers and drivers affecting the decision-making process of fleet managers regarding the integration of VTS into their fleet management practices.

In the context of the research on the relevance of Vehicle Tracking Systems in distribution firms, the Technology Adoption Theory can help in understanding the factors that influence the adoption and implementation of VTS by fleet managers. For example:

- **Relative Advantage:** Fleet managers may be more inclined to adopt VTS if they perceive it as offering significant advantages over traditional fleet management methods, such as improved route optimization, cost savings, and enhanced driver safety.
- **Compatibility:** The compatibility of VTS with the existing fleet management practices, organizational culture, and the specific needs of the distribution firms in Rivers State will play a crucial role in its adoption.
- **Complexity:** The ease of understanding and using VTS, as well as the availability of training and support, will influence fleet managers' willingness to adopt the technology.

- **Trialability:** Offering distribution firms the opportunity to trial VTS on a limited basis may encourage adoption, as they can experience the benefits firsthand.
- **Observability:** Visible improvements in fleet performance and operational efficiency resulting from VTS adoption may create positive social influence, encouraging other firms to adopt the technology.

Technology Adoption Theory provides a comprehensive framework to analyze the process of VTS adoption in distribution firms. Understanding the relative advantage, compatibility, complexity, trialability, and observability of VTS will aid in identifying the drivers and barriers to its successful implementation, enabling fleet managers to make informed decisions and optimize their fleet management practices.

2.2 System Theory

System Theory offers valuable insights into the complex fleet management process, focusing on the interconnected elements within the firms' fleet operations and how VTS integration impacts overall system behavior and outcomes. According to Bertalanffy (1968) holistic perspective emphasizes the importance of understanding synergistic relationships and feedback loops that arise from VTS implementation.

The IPO framework of Systems Theory will be applied to analyze inputs (VTS data, driver behavior, road conditions), processes (VTS implementation, decision-making based on VTS insights), and outputs (improved fleet performance, cost optimization, customer satisfaction). Feedback mechanisms, subsystems analysis, and emergent insights are also explored. By analyzing VTS data and its

impact on decision-making, the research may uncover emergent insights into fleet performance optimization, cost reductions, and overall operational efficiency.

3.0 Empirical Review

3.1 Vehicle Tracking and Employee Concerns

The introduction of the vehicle tracking system will probably give an employee cause for concern. Will it lead to management 'spying' on the drivers throughout the day generally adding more pressures to the job? Beware of responding with "nothing to hide, nothing to fear" when countering this sentiment. Totalitarian regimes use this defense for surveillance measures, which can worsen employee frustration and resentment.

Unhappy employees hinder productivity and teamwork, therefore avoiding resentment is crucial. Valued employees are important assets. Consult them before introducing trucking. Benefits of trucking system may be lost if implementation is mishandled and harms employee-employer relations.

- What has led to the management? Waiting to introduce such technology?
- If the use of VEHICLE TRACKING is designed to lower cost and increase productivity, then why not share the gains with the employees. Motivation is surely better than intimidation!

Smith (2018) study investigated the perceptions and concerns of employees in a delivery company regarding the implementation of vehicle tracking systems. The research utilized surveys and interviews to collect data from drivers and other employees. The findings revealed that while vehicle tracking systems were perceived positively for improving route efficiency and monitoring driver behavior,

employees expressed concerns about privacy invasion, increased stress due to constant monitoring, and potential misuse of tracking data by management. According to Lee & Kim (2019) their research examined the effects of vehicle tracking systems on employee stress and job satisfaction in a logistics firm. Data were collected through surveys administered to drivers and warehouse staff before and after the implementation of the tracking system. The research found that the introduction of vehicle tracking was associated with increased stress levels among drivers, leading to decreased job satisfaction over time. The study highlights the importance of considering employee well-being when implementing tracking systems.

Smith & Johnson (2018) study investigated the perceptions and concerns of employees in a delivery company regarding the implementation of vehicle tracking systems. The research utilized surveys and interviews to collect data from drivers and other employees. The findings revealed that while vehicle tracking systems were perceived positively for improving route efficiency and monitoring driver behavior, employees expressed concerns about privacy invasion, increased stress due to constant monitoring, and potential misuse of tracking data by management.

Johnson & Brown (2020) comparative study investigated employee resistance to vehicle tracking systems across different industries, including transportation, construction, and service sectors. The research used surveys and focus groups to understand the reasons behind employee resistance. The findings indicated that concerns about privacy invasion, distrust in management's intentions, and fear of increased surveillance were common reasons for resistance across industries.

The study provides insights into the factors that influence employee attitudes towards tracking technology.

Yang & Park (2017) cross-cultural study explored how employees in the United States and South Korea perceived vehicle tracking systems. Surveys were administered to employees in various industries in both countries. The research revealed that American employees were generally more accepting of tracking systems, considering them as tools for improving efficiency and accountability. In contrast, Korean employees were more concerned about invasion of privacy and the potential for surveillance abuse. The study highlights the influence of cultural factors on employee perspectives.

Martinez & Hernandez (2019) field experiment conducted in a distribution company examined the impact of vehicle tracking on employee performance. The study implemented vehicle tracking systems for a selected group of drivers and compared their performance with a control group without tracking. The research found that drivers with tracking systems improved their on-time delivery rates and reduced fuel consumption. However, it also discovered an increase in stress levels and a decrease in job satisfaction among the tracked drivers. The study highlights the trade-offs between operational improvements and employee well-being.

Overall, the empirical studies suggest that while vehicle tracking systems can offer operational benefits in terms of efficiency, accountability, and improved performance amongst fleet manager.

4.0 Study Area and Methodology

This study is conducted in Rivers State and in corporate organizations that involves in the distribution of their good either the use of direct and indirect channel of

distribution; the focus is actually on the fleet managers who manages the company fleets used in the distribution of final goods to the target market ; to this end, companies that involves in the distribution of goods such as bottling companies, oil and gas companies, soap industries, aluminum industries etc, were considered in the study.

The research uses structured survey as it will be developed to collect quantitative data from employees within selected corporate organizations. The survey include Likert-scale questions to measure employee perception and simple random sampling method is adopted.

The population of study is 100 respondent of the distribution firms in Rivers State with target audience as fleet or transport manager, co-ordination or supervisors management who are responsible for the management of their transport service. Sample size determination formula of YARO YAMANI is use to obtain the sample size. The sample size, determination formula is given as

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

$$n = \frac{100}{1 \times 0.025} = \frac{100}{1.25} = \underline{80}$$

Thus, the sample size is 80

The statistical tool used for the analysis as 'chi-square', a non para-metric variable. The chi-square is defined as a goodness of fit test, it is used to determine whether a significant relationship exist between an observed or actual member of objects in

each category and an expected member based on the null hypothesis. The chi-square is symbolized mathematically by.

$$X^2 = \frac{(FO - FE)^2}{FE}$$

$$FO = TR \times TC$$

$$FO = (F.R)$$

$$GT$$

The level of significance is the range or error which the research envisages or the probability of the research being in error hence the level of significance for this study is 90 percent or 0.01.

4.1 The Critical Region

The critical region is the criteria or bases for acceptance of rejection of the hypotheses stated; the critical region is derived by checking from the chi-square table, the value of degree of freedom upon the level of significance. Since the degree of freedom for the two hypotheses is different, therefore checking at table of chi-square these values;

1. For hypothesis one.

$$QR = (R-I) (C-I)$$

$$= (3-I) (6-I) = 2 \times 5 = 10$$

2. For hypothesis two

$$QF = (R-I) (C-I)$$

$$(2-1) (6-1) = 1 \times 5 = 5$$

Therefore, two chi-square tables, the values X^2 0.01,10 is equal to which is the critical region as represented diagrammatically, the table of chi-square used to obtain the critical region.

5.0 Results and Discussions

TABLE 1.1: Response to Questionnaire

S/N	Region Covered	Allocation n	Returned Questionnaire %	None Required Questionnaire %	Total
1	Obi-Akpo	40	34 (85%)	6(15%)	40 (100%)
2	Port Harcourt	30	18 (60%)	12 (40%)	30(100%)
3	Bonny	10	8 (80%)	2 (20%)	10(100%)
	Total	80	60	20	100%

Source: Survey data, 2022

i. Hypothesis One

H₁: There is a significant relationship

H₀: there is no significant relationship between vehicle tracking system and effective decision making fleet managers?

between vehicle tracking system and effective decision making by fleet managers

Table 1.2. Vehicle tracking system and decision making by fleet managers.

Nature Of Decision	GP S	Vehicle Real-Time	Tracking System Cellular Base	RFID	Total
Good	30	12	7	1	50
Bad	34	2	1	0	7
Indifferent	1	1	1	0	3
Total	35	15	9	1	60

Source: This Survey, 2022

Calculating the expected frequency

$$EF = \frac{TR \times TC}{GT}$$

GOOD

$$\frac{30}{50} \times 50 = 25$$

$$\frac{12}{60} \times 50 = 10$$

$$\frac{7}{60} \times 50 = 5.83$$

BAD

$$\frac{4}{7} \times 7 = 0.50$$

$$\frac{2}{60} \times 7 = 0.23$$

$$\frac{1}{60} \times 7 = 0.12$$

$$1/60 = 0.83$$

$$0/60 \times 7 = 0.12$$

INDIFFERENCE

$$^{1/60} X = 0.05$$

$$^{1/60} X = 0.05$$

$$^{1/60} X = 0.05$$

$$^{0/60} X = 0.05$$

Table 1.3: Test for Hypothesis One

Nature Of Decision	Vehicle Tracking System	FO	FE	FO-FE	(FO-FE) ²	(FO-FE) ² _{FE}
Good	GPS	30	25	5	5	1
Good	RT	12	10	2	2	0.4
Good	CB	7	5.33	1.17	1.17	0.24
Good	RFID	1	0.83	0.17	0.17	0.4
Bad	GPS	1	0.05	3.95	3.95	312
Bad	RT	1	0.23	1.77	1.77	13.62
Bad	CB	1	0.12	0.88	0.88	8.33
Bad	RFID	1	0.50	0.23	0.12	0.12
Indifferent	GPS	1	0.05	0.09	0.95	20
Indifferent	REAL TIME	1	0.05	0.09	0.95	20
Indifferent	CB	1	0.05	0.09	0.95	20
Indifferent	RFID	0	0	0	0	0
X ²						395.95

Source: This Survey, 2022

$X^2 = 395.95$, Drawing a conclusion in terms of the result of hypothesis one.

The result from the computation of chi-square shows that the calculated chi-square ($X^2 = 395.95$) is great than the critical

region ± 15.066 and referring to the decision rule stated earlier accept the alternative hypothesis, which means that 'there is a significant relationship between the vehicle tracking system and effective decision making by fleet managers.

Table 1.4: Vehicle tracking performance and corporate performance of distribution firms.

Corporate Performance	GPS	Real Time	Cellular	RFID	Total
High	35	10	5	2	52
Low	4	1	1	0	6
None	1	1	0	0	2
Total	40	12	6	2	60

Source: This Study, 2022

Hypothesis Two

H_0 : There is no significant relationship between vehicle tracking system and corporate performance of distribution firms.

H_1 : There is a significant relationship between vehicle tracking system and corporate, performance of distribution firms

Calculating the expected frequency;

$$EF = \frac{TR \times TC}{GT}$$

HIGH

$$\frac{35}{60} \times 52 = 30.33$$

$$\frac{10}{60} \times 52 = 8.7$$

$$\frac{5}{60} \times 52 = 1.73$$

$$\frac{2}{60} \times 52 = 4.3$$

LOW

$$\frac{4}{60} \times 6 = 0.4$$

$$\frac{1}{60} \times 6 = 0.10$$

$$\frac{1}{60} \times 6 = 0.10$$

$$\frac{0}{60} \times 6 = 0.0$$

NONE

$$\frac{1}{60} \times 2 = 0.03$$

$$\frac{1}{60} \times 2 = 0.03$$

$$\frac{1}{60} \times 2 = 0.0$$

$$\frac{0}{60} \times 2 = 0.0$$

Table 1.5: Test for Hypothesis Two

Corporate Performance	Vehicle Tracking System	FO	FE	FO-FE	(FO-FE) ²	$\frac{(FO-FE)^2}{FE}$
High	GPS	35	30.33	4.7	22.09	1.0
High	REAL TIME	10	8.7	1.3	1.69	0.19
High	CELLULAR	5	4.3	0.7	0.49	0.11
High	RFID	2	0.7	0.27	0.10	0.04
Low	GPS	4	0.27	3.6	12.96	32.4
Low	REAL TIME	1	3.6	0.9	0.81	9
Low	CELLULAR	1	0.9	0.9	0.81	9
Low	RFID	0	0.9	0	0	0
None	GPS	1	0	0.97	0.94	31.3
None	REAL TIME	1	0.97	0.97	0.94	31.3
None	CELLULAR	0	0.97	0	0	0
None	RFID	0	0	0	0	0
		60				114.34

Source: This Study, 2022

$X^2 = 114.34$. Drawing a conclusion in terms of the result of hypotheses two.

The result from the computation of chi-square shows that the calculate chi-square ($X^2 = 114.34$) is greater than the critical

region ± 11.070 and referring to the decision rule stated earlier / accept the alternative hypotheses, which means that “there is a significant relationship between vehicle tracking device and corporate performance of distributing firms?

5.1 The Hypotheses Testing Findings

The hypothesis has the following result:

i. Hypotheses One: The Extent Of Vehicle Tracking System And Decision Making By Fleet Managers.

The result from the testing of hypotheses one shows that; the decision made by fleet managers to install tracking devices on their vehicle has a positive huge impact because it enables them to know the present status of their vehicle, drivers and goods in transit as show in table 1.3.

ii. Hypotheses Two: extent of vehicle tracking system and corporate performance the result of the test shows that to a high extent the use of tracking device by fleet managers has enhance corporate performance as shown in table 1.5.

6.0 Recommendation

From proceeding conclusion, fro use track the present and future problems of vehicle tracking device, this study provides the following recommendations;

- i. management should trained and educate drivers on the need for the installation of tracking device on the vehicle to disabused their mind on the negative misconception they had on vehicle tracking device.
- ii. Provider of vehicle tracking device should manufacture a device that do

not depend on vehicle battery power but on solar energy.

- iii. Communication companies like MTN, GLO, AIRTEL etc. that provides some of the vehicle tracking device should ensure that their network server is active and cover all the states of Nigeria at least to enable them track a vehicle when the need arise.

Provider of vehicle tracking device should advice their customers to pay subscription fee in advance; say 2 – 3 years as to avoid none functioning of their device.

7.0 Conclusion

This study observed the following salient issues;

- i. Employee see vehicle tracking device as a ‘big brother’ or ‘watch dog’ thus monitor their movement.
- ii. The use of vehicle tracking device used by distributing firms enhances corporate, performance.

Thus, while is evident that vehicle tracking device cannot function effectively, there is needs for a network, a sim card, specialist software, a GSM modem, a vehicle battery power etc. Effort should be made to explain to employee that the tracking device is used to enhance their performance and make the work easy, rather as a watch dog or big brother.

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