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## VEHICLE TRACKING AND SUSTAINABLE COMPETITIVE ADVANTAGE OF OIL AND GAS COMPANIES IN RIVERS STATE, NIGERIA

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### ABSTRACTS

This study sought to determine the place of vehicle tracking in companies' responsiveness and agility. The study focused on oil and gas companies in the Rivers State, Nigeria. In lieu of the outcome of the study, the study concludes that vehicle tracking has strong significant and positive influence on organizational responsibility and organizational agility. Therefore the study, concludes that, vehicle tracking significantly influences organizational responsiveness and agility of oil and gas companies in Rivers State, and recommends that oil and gas companies' should provide sufficient vehicle tracking programs that promote increase in volume of sustainable competitive advantage activities (organizational responsiveness and organizational agility) in their companies and the vehicle tracking activities of oil and gas companies should be tailored towards exposing their companies programs towards the accomplishment of attainment that will relate positively with sustainable competitive advantage.

**Keywords:** Oil and gas firms, organizational responsiveness, organizational agility, vehicle tracking

### INTRODUCTION

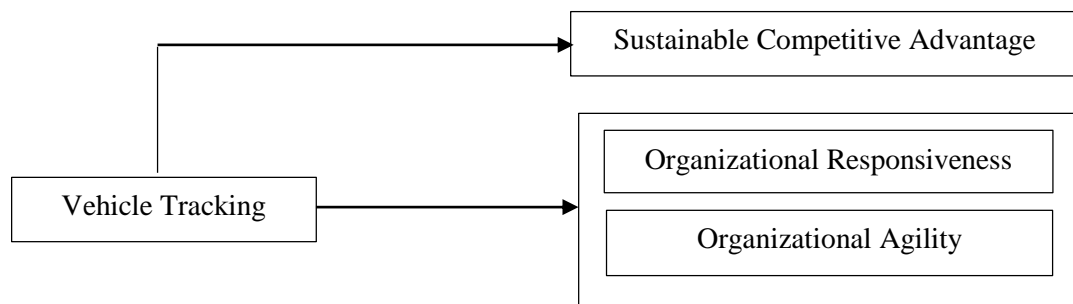
Sustainable competitive advantage conventionally engrosses the choice concerning the markets in which a company would compete, shielding market sector in obviously definite fragments by means of price and product performance qualities. At the moment, however, competition is contemplated as a war of movement that depends on looking forward to and swiftly acting in response to shifting market demands. Competitive advantage begins from the establishment of superior capabilities that are weighted to engender customer value and realize cost and/or differentiation advantages, originating market share and profitability performance (Barney, 1991).

Sustainable competitive advantage dictates that firms set up precincts that make replication demanding all the way through persistent speculation to heighten the potency, making this an enduring recurring process. A sustainable competitive advantage materializes as an essential dynamic in the perception of goods and services value. Due to the importance of sustainable competitive advantage to long-standing success of companies, diverse categories of strategies that may help firms realize sustainable competitive advantage have been espoused in literature. To settle competitively in the contemporary demanding business setting, a rising number of firms build up effective transport management as an important activity in their organizations. The quest to achieve sustainable competitive advantage has therefore put pressure on management to deliver faster and cheaper vehicle utilization and fleet management through better planning (Gitahi & Ogollah, 2014; Waters, 2009).

A vehicle tracking system combines the use of automatic vehicle location in individual vehicles with software that collects these fleet data for a comprehensive picture of vehicle locations. Modern vehicle tracking systems commonly use GPS technology for locating the vehicle, but other types of automatic vehicle location technology can also be used. Vehicle information can be viewed on electronic maps via the Internet or specialized software. Urban public transit authorities are an increasingly common user of vehicle tracking systems, particularly in large cities. (Penton, 2011).

Vehicle tracking systems are commonly used by fleet operators for fleet management functions such as fleet tracking, routing, dispatching, on-board information and security (Penton, 2011). Along with commercial fleet operators, urban transit agencies use the technology for a number of purposes, including monitoring schedule adherence of buses in service, triggering automatic changes of buses' destination sign displays once the vehicle approaches the bus terminus, and triggering pre-recorded (or even synthetic speech) bus stop, route (and its destination) or service announcements for passengers.

Fleet management has become very important that the ability of management to effectively and efficiently coordinate its activities will influence service delivery. Fleet management has become necessary for transport service delivery systems whether in the public or private sector. It is important to note that fleet management for most organizations is seen as having short term effect and short response periods (Martinez, Stapleton & Van Wassenhove, 2011).). There are varied services offered through transport and most of these services have been segmented into areas of expertise and specialty which aimed at offering valued services through effective fleet management practices (Bask et al., 2010).



**Fig. 1:** Conceptual framework of influence of vehicle tracking on sustainable competitive advantage

### Theoretical Foundation - Dynamic Capabilities Theory

Dynamic capabilities theory talk about “the firm’s ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments” (Teece, 1997), and involves “difficult-to-replicate enterprise capabilities required to adapt to changing customer and technological opportunities” (Teece, 2007). Dynamic capabilities denote exacting schedules that conglomerate, transmute or refurbish resources into fresh capabilities as markets advance (Eisenhardt & Martin 2000). Accordingly, dynamic capabilities are habitually established gradually and are not only determined by a company’s perceptible and imperceptible resource base at a specified time period, but also by the conclusions it has prepared during its past (Ambrosini et al., 2009; Eisenhardt & Martin 2000).

Dynamic capabilities are cultured and steady configurations of behavior through which a company analytically engenders and transforms its technique of performance to attain effectiveness. Resources are pooled to develop capabilities (Grant, 1996) and such amalgamations of capabilities in essence can generate aptitudes or capabilities that can extend crosswise people, functions and organizational precincts (Day, 1994). This study intellectualizes fleet management mechanisms as such a dynamic capability fashioned

by a zenith of numerous logistic aptitudes to meet the circumstance and will generate other capability grounded aftermaths.

### **Concept of Vehicle Tracking**

Vehicle tracking refers to monitoring the movement of vehicle, either by scanning barcode attached to the vehicle or by using smart tags. Vehicle can also be monitored by using devices that integrate the GPS Global Positioning System and Cellular network or Satellite technology. The vehicle tracking directed to general fleet management system, ensure the tracking all goods and physical items that have been provided to a driver or loaded on a vehicle. It is believed that, information systems that are used for coordination and routing services in the field positively impact on routine increment and performance of fleet (Martinez et al., 2011).

However, there is basically inadequate data-base as well as funds to buy such a system. As noted by Huang, Smilowitz and Balcik (2012), logisticians make routing and delivery scheduling decisions based on the insights and experiences they have about particular information. With advancement in communication technology in the business world, most organizations are engaging in innovative forms of planning through the utilization of electronic data interchange (EDI) as well as radio frequency identification (RFID) and satellite navigation (Waters, 2009) to collect the right information about vehicle movement which result in higher operational efficiency (Hesketh et al., 2015).

### **Organizational Responsiveness**

Responsiveness is the ability of a firm to react resolutely and within appropriate timeframe to customer demands or modifications in the market (Murauskiene, 2014). Organizational responsiveness is the swiftness and extent to which firms can deal with alterations in customer requirements (Holweg, 2005; Prater et al., 2001; Lummus et al., 2003; Duclos et al., 2003). Holweg (2005) noted that, capability of firms to respond persistently, in appropriate time to demand of customers or change in the market to sustain its competitive advantage is known as responsiveness, Responsiveness is a foremost potential of agility, smooth process stream and cost and also highlights the connection with lean philosophy.

### **Organizational Agility**

Agility is a construct in operations management literature that describes companies' capacity to swiftly fine-tune schemes and processes its activities (Swafford et al., 2006). Agility emerged as a leading competitive feature for companies operating in surfacing business setting. Kisperska-Moron and de Haan (2011) see organizational agility as the capacity to retort quickly to outer modifications. Agility implies utilizing market knowledge to take advantage of cost-effective openings (Cai-feng, 2009). Furthermore, agility is the ability to retort to unanticipated market modifications and translate these into new business prospects (Ngai et al., 2011). Agility is a tactical initiative that embraces service, flexibility and responsiveness (Costantino et al., 2012). The building blocks of agility are immature and it is infrequent for two critiques to take up identical descriptions (Conboy, 2009). Studies affirm that the agile notion can be perceived as an upgrading from the leanness concept (Jain *et al.*, 2008). Agile firms institute structures that incorporate market sensitivity, network integration, virtual integration and process integration.

### **Organizational Responsiveness and Agility: The Place Vehicle Tracking**

Chiparo et al. (2022) examine influence of fleet management practices on service delivery in State-Owned Enterprises (SOEs) in Zimbabwe. The study concluded that vehicle maintenance, fuel management, driver management and vehicle replacement positively influence service delivery; and that information and communication technology (ICT) moderate the influence of vehicle fleet management practices on service delivery. The study recommended that there is need for regular driver training and vehicle programs encompassing electronic spares tracking.

Otoo (2018) examine challenges of fleet management and control in University of Education, Winneba (Kumasi-Campus). This assessment was done in a bid to analyze how the University is able to derive value for money in the operations of the Transport Section of the institution. The study adopted the quantitative research methodology to assess the problem. That notwithstanding, using the purposive sampling technique a total of 161 respondents were used for the study which comprised 60 and 101 senior and junior members of the University respectively. The study revealed that for effective vehicle management, official vehicles should be insured and that there should be strict regulation on access to official vehicles.

Can et al. (2015) investigated IT based vehicle tracking system for effective management in public organizations in Izmir and in Aegean Area. The results of the study proved that, IT infrastructure has a positive contribution to the performance increase in public institutions. Additionally, the system allows the users to perform “automate” and “informate”. Automate means saving the coordinate information automatically into the system and then providing information about the update status of the vehicles.

Mukhtar (2015), studied GPS based advanced vehicle tracking and vehicle control system. The aim of this project is to remotely track a vehicle’s location, remotely switch ON and OFF the vehicle’s ignition system and remotely lock and unlock the doors of the vehicle. An SMS message is sent to the tracking system and the system responds to the users request by performing appropriate actions. Short text messages are assigned to each of these features. A webpage is specifically designed to view the vehicle’s location on Google maps. By using relay based control concept introduced in this paper, number of control features such as turning heater on/off, radio on/off etc. can be implemented in the same fashion.

However, it is hypothesized that:

**Ho<sub>1</sub>:** There is no significant influence of vehicle tracking on responsiveness of oil and gas companies in Rivers State.

**Ho<sub>2</sub>:** There is no significant influence of vehicle tracking on agility of oil and gas companies in Rivers State.

## METHODOLOGY

The study adopted a descriptive research design with a casual investigation on the influence of vehicle tracking on sustainable competitive advantage within the Nigerian oil and gas sector. The target population of the study consists of two hundred and ninety-five (295) registered oil and gas companies in Rivers State. The sample size of the study was 170 which was drawn using Taro Yamane sampling formula. The respondents of this study were three (3) executive departments each of the 170 oil and gas companies. These are: the Marketing, Production and Customer Service department of oil and gas companies. This summed up to one hundred and forty one (510) respondents. The research instrument was designed in 5-point Likert scale. The construct validity was assured by structuring the questionnaire according to the specific objectives while Cronbach’s Alpha reliability test with a threshold of 0.70 was generated by the use of SPSS.

**Table 1: Reliability Analysis Vehicle Tracking and Sustainable Competitive advantage**

S/N	Variables	Number of Items	Cronbach’s Alpha
1.	Vehicle Tracking	3	0.828
2.	Organizational Responsiveness	3	0.728
3.	Organizational Agility	3	0.842

**Source:** Researcher Field Data (2022)

**DATA ANALYSIS AND RESULTS**

**Table 2: Influence of Vehicle Tracking on Sustainable Competitive Advantage**

S/N	Items	Frequencies / Percentages				
		VLE	LE	ME	HE	VHE
1	The organization is using the vehicle tracking system for fleet management.	-	-	34	61	105
		0%	0%	%	%	%
2	The organization has modern technology of GPS for vehicle tracking system.	-	-	102	244	525
		9	20	31	44	96
3	The organization provides immediate solution for problems encounter in vehicle tracking.	4.5%	10%	15.5%	2.2%	4.8%
		9	4	93	176	480
		-	4	41	66	39
		-	2%	20.5%	33%	44,5%
		-	8	123	264	445

**Source:** Research data, 2022.

Table 2 shows frequencies of vehicle tracking and supply chain collaboration for oil and gas companies studied. The organization is using the vehicle tracking system for fleet management, recorded no response on very low extent, low extent also recorded no response, 34 (17%) was recorded moderate extent, 61 (30.5%) as high extent, and 105 (52.5%) as very high extent. On the organization has modern technology of GPS for vehicle tracking system, very low extent presented 9(4.5%), low extent presented 20(10%), moderate extent 31 (15.5%) agree 44 (22%), and 96(48%) for very high extent. The item on the organization provides immediate solution for problems encounter in vehicle tracking, gave no response to very low extent 4(2%) for low extent, 41(20.5%), for moderate extent, 66 (33%) for high extent and 89(44.5%) for very high extent. This implies that vehicle tracking is a major requirement for oil and gas companies in Rivers State.

**Table 3: Influence of Vehicle Tracking on Organizational Responsiveness**

Model	R	R Square	Adjusted R Square	Std. Error of the estimate
1	.727	.684	.682	.647

a. Predictors: (Constant), Vehicle Tracking

b. Criterion: Organizational Responsiveness

Source: SPSS Window Output, Version 22.0 (based on 2022 field survey data).

Given that for hypothesis one, the significant is .000 which is less than 0.05; there is a significant, effect of vehicle tracking on organizational responsiveness with the R-square that there is 72.7% direct relationship between vehicle tracking and organizational responsiveness. R–square value of 68.4% shows that vehicle tracking can affect organizational responsiveness to a high degree. The researcher also used ANOVA to test the hypothesis in this section.

**Table 4: One way ANOVA for the difference in mean between Vehicle Tracking and Organizational Responsiveness**

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	3201393	1	3201393	648433	.0000
Within Groups	1481137	333		199595	
Total	4682530	334			

a. criterion: Organizational Responsiveness

b. Predictor: Vehicle Tracking

Source: SPSS Window Output, Version 22.0 (based on 2022 field survey data).

Table 4 shows that there is difference in mean between vehicle tracking and organizational responsiveness  $F(dfB,dfw) = F(333,1) = 648433, p < 0.05$ . Significant value is 0.00,  $r(1,333)$ .

**Table 5: Influence of Vehicle Tracking on Organizational Agility**

Model	R	R Square	Adjusted R Square	Std. Error of the estimate
1	.764	.647	.645	.628

a. Predictors: (Constant), Vehicle Tracking

b. Criterion: Organizational agility

Source: SPSS Window Output, Version 22.0 (based on 2022 field survey data).

Given that for hypothesis four, the significant is .000 which is less than 0.05; there is a significant, influence of vehicle tracking on organizational agility with the R (Coefficient of Correlation) that there is 76.4% direct relationship between vehicle tracking and organizational agility. R-square value of 64.7% shows that vehicle tracking can influence organizational agility to a high degree. The researcher also used ANOVA to test the hypothesis in this section.

**Table 6: One way ANOVA for the difference in mean between Vehicle Tracking and Organizational Agility**

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	36496263	1	36496263	8.84184	.0000
Within Groups	118627	333	648		
Total	614870	334			

a. criterion: Organizational Agility

b. Predictor: Vehicle Tracking

Source: SPSS Window Output, Version 22.0 (based on 2022 field survey data).

Table 6 shows that there is difference in mean between vehicle tracking and organizational agility  $F(dfB,dfw) = F(333,1) = 8.84184, p < 0.05$ . Significant value is 0.01,  $r(1,333)$ .

## DISCUSSION OF FINDINGS

The result of the test of the first and second hypotheses confirmed a significant influence of vehicle tracking on measures of sustainable competitive advantage (organizational responsibility and organizational agility). If oil and gas companies exhibit sound knowledge of the positive effect of vehicle tracking and also access same towards sustainable competitive advantage, they will certainly achieve optimal performance. Vehicle tracking focused toward broad fleet management system, guarantee the tracking all goods and physical substances that have been provided to a driver or loaded on a vehicle. Thus, knowledge of the positive impact of vehicle tracking on sustainable competitive advantage should be doggedly well thought-out and reflected upon by all participants in oil and gas sector of the Nigerian economy in view of the ever increasing competition in the contemporary business landscape. Our research finding is supported by Chiparo et al. (2022) who revealed that, driver management and vehicle replacement positively influence service delivery.

## CONCLUSION AND RECOMMENDATIONS

This study examined the level to which vehicle tracking affect sustainable competitive advantage of oil and gas companies in Rivers State by means of a quantitative analysis, which makes palpable that in attendance are ample confirmations that the machineries of vehicle tracking investigated by this existing study were enthusiastically linked with sustainable competitive, bestowing a good judgment to proclaim on it variable having the latent to electrify sustainable competitive advantage, and their nonattendance beseeches business

reversion in the long run, thus encumbering sustainable competitive advantage. The study therefore, concludes that there is a significant and positive influence of vehicle tracking on sustainable competitive advantage on of oil and gas companies in Rivers State of Nigeria. The study recommends thus:

- 1) Oil and gas companies' stakeholders should provide sufficient vehicle tracking programs that promote increase in volume of sustainable competitive advantage activities (organizational responsiveness and organizational agility) in their companies.
- 2) Vehicle tracking activities of oil and gas companies should be tailored towards exposing their companies programs towards the accomplishment of attainment that will relate positively with sustainable competitive advantage.

## REFERENCES

- Begashaw, M. (2018). *The Effect of Fleet Management on Fleet Efficiency from the School of Graduate Studies by Department of Logistics and Supply Chain Management* Approved by the Committee of Examiners: Advisor Internal Examiner Signature. University of Addis Ababa, Addis Ababa.
- Besiou, M., Martinez, A. J. P., & Van Wassenhove, L. N. (2012). The effect of earmarked funding on fleet management for relief & development. INSEAD, Working Paper
- Besiou, M., pedraza-martinez, a. j. & van wassenhove, l. n. (2012). Decentralization and earmarked funding in humanitarian logistics for relief and development. Instead working paper 2012/10/TOM/ISIC<https://doi.org/10.2139/ssrn.1991068>
- Beske, P., & Seuring, S. (2014). Putting sustainability into supply chain management. Retrieved from [www.google.com](http://www.google.com)
- Braunscheidel, M. J. (2005). *Antecedents of supply chain agility: An empirical investigation*. Published PhD Thesis. School of Management University of Buffalo the State University of New York.
- Cai-feng, L. (2009). Agile supply chains: competing in volatile markets. *Management Science and Engineering*, 3 (2), 61-64.
- Can, T., Cigdem, E., & Vahap, I. (2015). IT based vehicle tracking system for effective management in public organizations. *Procedia Economics and Finance*, 33, 506 – 517.
- Caves, R. E. (1984). Economic analysis and the quest for competitive advantage. *The American Economic Review*, 74 (2).
- Chiparo, J. P., Tukuta, M., & Musanzikwa, M. (2022). Vehicle fleet management practices and service delivery in State owned enterprises in Zimbabwe. *Journal of Transportation Technologies*, 12, 159-171.
- Conboy, K. (2009). Agility from first principles: reconstructing the concept of agility in information systems development. *Information System Research* 20 (3), 329-354.
- Holweg, M. (2005). An investigation into supplier responsiveness. *International Journal of Logistics Management*, 16 (1), 96-119.
- Holweg, M. (2005). The three dimensions of responsiveness. *International Journal of Operations & Production Management*, 25 (7), 605.
- Homans, G. C. (1958). Social behavior as exchange. *American Journal of Sociology*, 63 (6), 597-606.
- Huang, M., Smilowitz, K., & Balcik, B. (2012). Models for relief routing: Equity, efficiency & efficacy. *Transportation Research Part E*, 48, 2-18.
- Hult, G. T., & Ketchen, D. J. (2007). Bridging organizational theory and supply chain management: The case of best value supply chains. *Journal of Operations Management*, 25 (2), 573-580.
- Islam, S., & Olsen, T. (2014). Truck-sharing challenges for hinterland trucking companies: A case study of the empty container truck trips problem. *Business Process Management Journal*, 20 (2), 290-334.

- Johannessen, J. A., & Olsen, B. (2003). Knowledge management and sustainable competitive advantages: The impact of dynamic contextual training. *International Journal of Information Management*, 23, 4, 277-289.
- Kamalahmadi, M., & Parast, M. M. (2016). A review of the literature on the principles of enterprise and supply chain resilience: Major findings and directions for future research. *International Journal of Production Economics*, 17, 116-133
- 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.
- Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995). An integrative model of organizational trust. *Academy of Management Review*, 20, 709-734.
- Mothade, M., Toloie-Eshlaghy, A., & Halvachi-Zadeh, D. (2011). Assessment of supply chain agility in the automotive industry of Tehran. *European Journal of Scientific Research*, 61(2), 210-229.
- Mukhtar, M. (2015). GPS based advanced vehicle tracking and vehicle control system. *International Journal of Intelligent Systems and Applications*, 3, 1-12.
- Ngai, E. W. T., Dorothy, C. K. Chau, T. L., & Chan, A. (2011). Information technology, operational, and managerial competencies for supply chain agility: Findings from case studies. *Journal of Strategic Information Systems*, 20 (3), 232-249.